Robert J. Marks II

Curriculum Vitae

Amplified

(Abbreviated CV also available)

December 7, 2018

Contents

1 Education

- Ph.D., Electrical Engineering, Texas Tech University, 1977
- M.S., Electrical Engineering, Rose-Hulman Institute of Technology, 1973
- B.S., Engineering, Rose-Hulman Institute of Technology, 1972

2 Contact Information

- Email: Robert_Marks@Baylor.edu
- Web Page: RobertMarks.org
- Office: Baylor Campus, Rogers Bldg. 305C
- Office Phone: (254) 710-7302
- Mailing Address: One Bear Place #97356, Waco, TX 76798-7356

3 Employment History

- 2003-present: Distinguished Professor of Electrical and Computer Science, Baylor University.
  - 2003-2005: Graduate Program Director, Departments of Mechanical and Electrical & Computer Engineering, Baylor University.
  - 2004-2008: Baylor Christian Graduate Student/Faculty Fellowship, Faculty Advisor.
  - 2004-2007: University Tenure Committee, Chair (2006-2007), Member (2004-2006).
  - 2008-2014: Faculty Search Committee, Chair.
  - 2008-2009: ECE Lecturer Search Committee, Chair.
  - 2008-2011: ECE Tenure Policy Committee, Chair.
  - 2008-2017: IEEE Baylor Student Branch, Faculty Advisor.
  - 2009-2011: Baylor Compensation, Benefits, and Personnel Committee, Member.
  - 2017-2018: University Faculty Dismissal Committee, Member
  - 2017- : Chair, ECE Dept Awards Committee
  - 2014- : ECE Graduate Studies Committee, Member
  - 2016- : American Scientific Affiliation (ASA) Baylor Student Group, Faculty co-advisor

- 2017- : Oso Logos (Christian apologetics)Baylor Student Group, Faculty co-advisor

- 1987-2003: Professor of Electrical Engineering, University of Seattle, Washington.
- 1982-1987: Associate Professor of Electrical Engineering, University of Seattle, Washington.
- 1978-1982: Assistant Professor of Electrical Engineering, University of Seattle, Washington.
- 1975-1977: Research Assistant, Texas Tech University, Lubbock, Texas.
- 1974-1975: Reliability Engineer, Crane Naval Weapons Depot, Crane, Indiana.
- 1972-1973: Graduate Student Teaching Assistant, Rose-Hulman Institute of Technology, Terre Haute, Indiana.
- 1970-1975: Disc Jockey, WPFR, Terre Haute, Indiana.
- 1968-1972: Student, Rose-Hulman Institute of Technology, Terre Haute, Indiana.

4 Recognition

4.1 Honors & Awards

- Fellow of the Optical Society of America (OSA)[1]
- Fellow of the Institute of Electrical & Electronic Engineers (IEEE)[2]
- Honorary Inductee: Junior Membership in the Ohio Academy of Science (at the age of eighteen)
- IEEE Distinguished Lecturer
- Honorary Member: Puget Sound Section of the Optical Society of America
- IEEE Centennial Medal and Certificate
- IEEE Outstanding Branch Counselor/Advisor Award
- Charter President of the IEEE Neural Networks Council
- Rose-Hulman Institute of Technology Outstanding Young Alumni Award
- Texas Tech Electrical Engineering Academy

[1] "For contributions to image recovery and synthesis, optical processing, and eletro-optical neural networks."

[2] "For leadership and contributions to the field of neural networks."

- ◇ IEEE Neural Networks Council Meritorious Service Award
- ◇ IEEE CASS (Circuits and Systems Society) Golden Jubilee Medal
- ◇ Judith Stitt Award, American Brachytherapy Society 23rd Annual Meeting (2001)
- ◇ NASA Tech Brief Award (2004)
- ◇ Pioneer in Neural Network Award (IJCNN) (2006)
- ◇ IEEE Dallas Section Volunteer of the Year Award (2007)
- ◇ DARPA[3]

4.2 Listings

- ◇ *Access Research Network* top award for the "Top 10 Darwin and Design Science Stories" for 2009.[4]
- ◇ CollegeCrunch.org. "The 20 Most Brilliant Christian Professors," April 4, 2010.[5]
- ◇ SuperScholar.org. "The 20 Most Influential Christian Scholars," 2010.[6]

[3] DARPA Radar/Communications Co-Design Challenge (2015) Arlington, VA 22203-2114. "The SSPARC [Shared Spectrum Access for Radar and Communications] program office will bring together a few [four] of the most senior, idea-driven, thoughtful researchers that have spanned both the radar and communications disciplines through their careers and challenge them to offer a vision of how to tackle the joint radar and communications co-design problem."

[4] "*Access Research Network* has just released its annual 'Top 10 Darwin and Design Science Stories' for 2009. Gaining top honors on the list was a peer-reviewed article by intelligent design theorists William Dembski and Robert Marks II in the September 2009 journal IEEE Transactions on Systems, Man and Cybernetics. The authors used computer simulations and information theory to challenge the ability of neo-Darwinian processes to create new functional genetic information."

[5] "The professors listed here are all 'brilliant' in the original sense of the wordthey shine brightly among their peers as towering figures in the academic world. In addition, they are all Christians who do not hide their Christianity and see it as significantly impacting their intellectual work." "Robert J. Marks II, Distinguished Professor of Electrical and Computer Engineering at Baylor University. A founder of the field of computational intelligence (comprising fuzzy sets, neural networks, and evolutionary computing), Marks has published hundreds of articles on an very wide range of problems (everything from optimal detection of non-Gaussian noise to proper placement of radioactive inserts to treat prostate cancer). His work has enormous practical implications that are felt every dayall major North American utilities deliver energy using his work on neural networks. An Christian intent on understanding teleology in nature, Marks founded the Evolutionary Informatics Lab, which publishes peer-reviewed scientific papers supporting the controversial theory of intelligent design."

[6] "Super Scholars 20 most influential Christian scholars have profoundly influenced the world by advancing Christian belief, by reconceptualizing it, or even by fundamentally challenging it. In any case, each of the thinkers below has deeply impacted Western cultures self-understanding." "Robert J. Marks II (b. 1950), Baylor Universitys leading research professor, has emerged as the public face of intelligent design. As the movements premier scientist, he has been dubbed the Charles Darwin of intelligent design. At one point, his research on intelligent design was removed by Baylor officials from the universitys website. Since then he has published seminal work on such themes as whether computers have minds and whether Darwinian processes can generate biological information. He is widely quoted as saying, Computers are no more able to create information than iPods are capable of creating music. His Law of Conservation of Information purports to

- ◇ TheBestSchools.org. "The 50 Smartest People of Faith." 2012.[7]
- ◇ L. A.Yahaya, "PERSONAL CHARACTERISTICS OF REPUTABLE SCHOLARS" 2013.[8]
- ◇ TheBestSchools.org. "The 50 Most Influential Scientists in the World Today." 2014.[9]

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demonstrate inherent limitations on natural selection, suggesting that the intricate information needed for life requires an intelligent source."

[7] The qualifications for inclusion on our list are twofold

1. Intellectual brilliance, evidenced by a very high level of achievement, whether in the natural sciences, the social sciences, the humanities, literature, the fine arts, or public service; and
2. Religious faith, evidenced either through explicit personal witness or through publicly professed respect for religion.

By religious faith, we mean religion in the monotheistic, or Abrahamic, traditionwhich we happen to know best. We do not doubt that a similar list of brilliant and devout Hindus, Buddhists, Daoists, Confucianists, Shintoists, and others could easily be drawn up, and we hope it will be, by those qualified to do so.

It is presented in alphabetical order.

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Robert J. Marks II (b. 1950). Marks was born in West Virginia. He was educated at the Rose-Hulman Institute of Technology (BS, Engineering, 1972; MS, Electrical Engineering, 1973) and Texas Tech (PhD, Electrical Engineering, 1977). He taught for many years at the University of Washington, in Seattle. He is currently Distinguished Professor of Electrical and Computer Engineering at Baylor University, in Waco, Texas. Marks, who is Protestant, has made a number of contributions to cutting-edge technology at the interface between electrical engineering and computer science. For example, in 1991 he was the first to apply artificial neural networks to the problem of forecasting power demands by electrical utility companiesa practice that is widespread today. More recently, Marks and colleagues developed an algorithm for the real-time tracking of the placement of radioactive seeds in prostate cancer therapy. In addition, his team developed the first closed-form solution for the Neyman-Pearson optimal detection of signals in non-Gaussian noise. In 2007, Marks inaugurated his *Evolutionary Informatics Lab*, a web site dedicated to simulating evolutionary processes. The Labwhich has demonstrated severe constraints on the creative potential of Darwinian-style algorithms was afterwards shut down by the Baylor University administration, and Marks has since moved it to a private server. Books: *Fuzzy Logic Technology and Applications*, editor (IEEE, 1994); *Neural Smithing: Supervised Learning in Feedforward Artificial Neural Networks*, co-author (MIT Press/Bradford Books, 1999); *Handbook of Fourier Analysis and Its Applications,* (Oxford UP, 2009)

[8] "Academic profession like other essential professions has its demands. For anyone to succeed in the profession, he/she needs to possess some personal characteristics. The focus of this presentation is to sensitize academic staff, particularly the young academics on the personal characteristics that are required to succeed in academic career. Some notable scholars who possessed the appropriate personality characteristics and that have excelled in academic endavour include: Fransisco Ayala, Abdulhamid Bin Badis, Ali Jabar, Abdul Qader Arnaoot, Peter L. Berger, Benjamin Carson, Hassan Hathont , Francis Collins , Omar Khalidi, Robert J. Marks. Others are...

[9] From biotechnology and digital media to sustainable energy and cloud computing, almost everything today is somehow affectedand sometimes entirely reshapedby scientific and technological advances.

By science in this article we mean the natural and engineering sciences (we thus exclude pure mathematics as well as the social sciences). Thus, in this article, we focus on scientists in the biological, medical, and physical sciences as well as those concerned with technology and especially computers.

As a society, we have come to take the fruits of science for granted, such as our use of computers, our access to running water and electricity, and our dependence on various forms of transportation and communication. But all such benefits follow from the discoveries and inventions of scientists as they pursue deep insights into the workings of nature and its materials.

This article focuses on the 50 most influential scientists alive today and their profound contributions to

4.3 Honorary Conference Positions

- ◇ International Advisory Chair. The RNNS [Russian Neural Network Society] IEEE Symposium on Neuroinformatics and Neurocomputing Rostov-on-Don , Russia , October 7-10, 1992,

- ◇ International Advisory Co-Chair. International Joint Conference on Neural Networks

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science. These are scientists who have invented the Internet and fiber optics, challenged AIDS and cancer, developed new drugs, and in general made crucial advances in medicine, genetics, astronomy, ecology, physics, and computer programming.

In referring to the scientists on this list as "influential," this article attempts to gauge their influence on science as such. In other words, the scientists listed here are influential because of the groundbreaking scientific work they have done and its impact on the world.

Some scientists are enormously influential as popularizers or culture critics or public intellectuals. In this respect, figures like Richard Dawkins and Lawrence Krauss, or Carl Sagan and Stephen Jay Gould a generation back, come to mind. The scientists on this list, however, are here because of their preeminence as scientists doing science.

The scientists described here are all creative and brilliant. Many of them are also unusual and interestingcolorful personalities that it would be a pleasure to know!

As you feast on the names and biographies of the scientists on this list, also check out our article The Worlds 50 Smartest Teenagers. Some of the most influential scientists in the future will be drawn from this list.

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28. Robert J. Marks II

Robert J. Marks II is the Distinguished Professor of Electrical and Computer Engineering at Baylor University in Waco, Texas. Previously, he was on the faculty of the University of Washington for 25 years. He is a pioneer in the field of computational intelligence (which includes neural networks, fuzzy sets, and evolutionary computing), and was the first president of the Institute of Electrical and Electronics Engineers (IEEE) Neural Networks Council.

Marks received his PhD in electrical engineering from Texas Tech University. He has over 300 peer-reviewed journal publications. He is also a proponent of intelligent design, holding that certain features of the universe and of living things are best explained by an intelligent cause, not an undirected process such as natural selection.

Marks has made important technical contributions across widely diverse areas, such as the spacing of radium inserts to treat prostate cancer, signal display, remote sensing, optical image sampling, optical computers, and the use of fuzzy logic to control the electrical grid (how electricity is delivered today depends crucially on the work of Marks). He has served as a consultant to companies such as Microsoft and Boeing corporation.

Marks has authored several books including, the Handbook of Fourier Analysis and Its Applications, Neural Smithing: Supervised Learning in Feedforward Artificial Neural Networks, and Applications of Neural Networks to Power Systems, among others.

Marks has received numerous awards, including the IEEE Distinguished Lecturer twice, once from the IEEE Neural Networks Council in 199192, and again from the IEEE Neural Networks Society in 200203, as well as the Golden Jubilee Medal in 1999 from the IEEE Circuits and Systems Society. He is a fellow of the IEEE.

In 2007, Marks founded the Evolutionary Informatics Lab at Baylor to study the information-theoretic underpinnings of intelligent design. The research of that lab has produced a steady stream of peer-reviewed engineering publications that are influencing many in the engineering community to accept intelligent design, controversial though it remains, as a legitimate scientific theory.

(IJCNN), Beijing, China. November 1992

- International Advisory Committee Member. International Joint Conference on Neural Networks (IJCNN), Nagoya, Japan, October 25-29, 1993.
- International Conference on Neural Information Processing (ICONIP '95), October 30 - November 3, 1995, Beijing China. International Advisory Committee, Member.
- 1993 IEEE/Tsukuba International Workshop on Advanced Robotics, November 8-9, 1993, AIST Tsukuba, Japan - Advisory Committee
- Honorary Program Committee Member. IEEE/IAFE [International Association of Financial Engineers] Computational Intelligence in Financial Engineering, (CIFEr).
  - Nashville, TN, March 30-April 2, 2009,
  - Paris, France, April 11-15, 2011.
- International Symposium on Neural Networks (ISNN) Advisory Committee.
  - 3rd International Symposium on Neural Networks (ISNN 2006) Chengdu, China, May 28 - June 1, 2006
  - 4th International Symposium on Neural Networks (ISNN 2007) Nanjing, China June 3-7, 2007
  - 5th International Symposium on Neural Networks (ISNN 2008) Beijing, China, September 24-28, 2008
  - 6th International Symposium on Neural Networks (ISNN 2009) Wuhan, China, May 26-29, 2009
  - 7th International Symposium on Neural Networks (ISNN 2010) Shanghai, China, June 6-9, 2010
  - 7th International Symposium on Neural Networks (ISNN 2011) Guilin, China May 29 June 1, 2011

5 Professional Societies

5.1 Publications

- IEEE
  - IEEE Transactions on Neural Networks, Editor-in-Chief (1992-1997)
  - IEEE Transactions on Fuzzy Systems, Associate Editor (1993-1999)
  - IEEE Transactions on Systems, Man & Cybernetics, Associate Editor (2011-2014)
- Optical Society of America

- Topical Editor, Journal of the Optical Society of America A: Optics and Image Science in Optical Signal Processing and Image Science (1990-92).

◇ Other

- International Journal of Computer Vision & Signal Processing (2011-present)
- Bio-Complexity, Editorial Board Member (2010-2014), Editor-in-Chief (2015-present) [http://bio-complexity.org/]
- International Journal of Neurocomputing, Editorial Board Member (1989-1992).
- Australian Journal of Intelligent Information Processing Systems, Editorial Board Member (1994-2007).
- Journal of Advanced Computational Intelligence, (ACI), Fuji Press Co., Tokyo, Editorial Board Member (1996-present).
- Association for Computing Machinery, The ACM SIGART Magazine of Intelligent Machinery, Editorial Board, (1996-2000).
- JOURNAL OF SAMPLING THEORY IN SIGNAL AND IMAGE PROCESSING-An International Journal, Editorial Board Member (2000-2014).
- JOURNAL OF ENGINEERING RESEARCH, International Advisory Editorial Board (2002-2004).
- International Journal of Soft and Intelligent Computing and Mathematics, Editorial Board Member (2008-2009).
- International Journal of Artificial Life Research, Editorial Board Member (2009-2011).

5.2 Administrative

◇ IEEE Technical Activities Board

- Technical Activities Board, Member (1990-91).
- IEEE Technical Activities Board New Technology Directions Committee (1991 - Member).
- IEEE TAB Meetings Council (1992 -member).
- Division X Director Nominating Committee (1992 - Chair).
- TAB Periodicals Council ad hoc Subcommittee on Budgetary Needs (1993 - Member).
- TAB Transactions Committee (1996 - member).

◇ IEEE Computer Society

- Task Force on Virtual Intelligence

◇ IEEE LEOS

- Representative to the IEEE Neural Networks Council (1994-96).

◇ IEEE Power Engineering Society

- Representative to the IEEE Neural Networks Council (2002-04).

◇ IEEE Circuits and Systems Society

- Fellows Committee (2004)
- Vice-President of Administration (2003-04)
- Chair, Administrative Activities Committee (2004).
- Board of Governors (1994-99, 2000-02)
- Restructuring and Best Practices Committee (Chair 2002).
- Society Parliamentarian (2001-04)
- CASS Policies and Procedures Formation Committee, Chair (2003, 2004).
- Budget Committee, Chair (2003, 2004).
- Technical Society on Neural Systems and Applications in the IEEE Circuits and Systems Society
  - † Co-Founder (1987)
  - † First Chair (1987-89)
- Darlington Award Committee (1996)-member
- CAS Publications Steering Committee (1996-97) member
- Constitution & Bylaws Committee (2000 member; 2002-03 Chair).
- Restructuring Committee (2001-02) member
- Representative to the IEEE Neural Networks Council (1996-98).
- Representative to the IEEE Neural Networks Committee (1987-88).

◇ IEEE Nanotechnology Council

- AdCom Member (2004-06)

◇ IEEE Computational Intelligence Society

- Awards Chair (2004-05)
- AdCom Member (2004-07)
- Fellows Committee (Member, 2004-05 ; Chair 2006)
- Representative to the IEEE Nanotechnology Council (2004-06)
- Technical Committee of Neural Networks Member (2004-06)
- Founder and First Chair, CIS Chapter of the Dallas IEEE Section (2006-07).

◇ IEEE Neural Networks Society

- AdCom Member (2002-4).
- Technical Activities Committee (Member 2002)

◇ IEEE Neural Networks Council

- (first) President, (1990-91)
- Past President (1992-93)
- Nomination Committee Chair (1992-93)
- Constitution & Bylaws Committee Chair (1997)
- Technical Committees (member)
  - † Neural Networks Technical Committee (1996-2004)
  - † Computational Finance Technical Committee (1995-2000)
  - † Awards Committee (member, 1997, 1999-2001)
  - † Fellows Evaluation Committee (member, 1997-2001)
  - † Publications Committee (member, 1999)
- Projects initiated during this period.
  - † The International Conference of Fuzzy Systems (FUZZ-IEEE).
  - † The Neural Networks Newsletter (CoNNections).
  - † The Neural Networks Council Forum meeting series.
  - † Neural Network Council Book Series (IEEE Press).
  - † IEEE Neural Networks Council Pioneer Awards.
  - † The IEEE Transactions on Fuzzy Systems.
  - † The World Congress on Computational Intelligence
  - † IEEE Neural Networks Standards Committee.
  - † IEEE Neural Networks Distinguished Lecture Program.

◇ IEEE Neural Networks Committee

- Chair (1989)
- Chair pro tem (1988-89)
- Secretary (1988).
- Ad Hoc Committee for founding the IEEE Transactions on Neural Networks (Chair)
- Projects initiated during Chairmanship
  - † The IEEE Transactions on Neural Networks.
  - † The first International Joint Conference of Neural Networks.

◇ IEEE

- Faculty Advisor to UW Student Section (1978-81).

- Faculty Advisor to Baylor Student Section (2008-present).

◇ Optical Society of America

- Puget Sound Section of the Optical Society of America
  - † Co-Founder (1987).
  - † First President (1987-88).
  - † (First) Honorary Member (1988).

5.3 Conferences

◇ IEEE Conference on Computational Intelligence for Financial Engineering & Economics (CIFEr)

- New York, New York, April 9-11, 1995, Program Co-Chair
- New York, New York, March 24-26, 1996, Co-Chair
- New York, New York, April 9-11, 1997, Co-Chair
- New York, New York, March 29-31, 1998, Co-Chair
- Nashville, TN, March 30April 2, 2009, Honorary Program Committee Member
- Paris, France, April 11-15, 2011, Honorary Program Chair

◇ IEEE World Congress on Computational Intelligence

- Orlando, FL, July 1994, Technical Program Director
- Anchorage, AL, 1998, Tutorials Chair

◇ Information Processing by Neural Networks, (IP+NN ' 97), October 10-17, 1997, Ukraine, Crimea, Gurzuf Russian Academy of Science, Russian Neural Network Society, International Academy of Computer Science; Program Co-Chair.

◇ IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)

- Yokohama, Japan, March 20 to March 24, 1995, International Program Committee
- Seoul, Korea, August 22-25, 1999, International Organizing Committee Member

◇ IEEE Virtual Reality Annual International Symposium (VRAIS)

- 1993 Seattle, (first) Organizing Chair
- 1995 Research Triangle Park, NC, Organization Chair

◇ The RNNS [Russian Neural Network Society] IEEE Symposium on Neuroinformatics and Neurocomputing

- Rostov-on-Don, Russia, October 7-10, 1992, International Advisory Chair

- Rostov-on-Don, Russia, October 9-11, 1995, Program Co-Chair

◇ IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis, Victoria, BC; October 4-6, 1992, Organization Chair

◇ International Forum on Applications of Neural Networks to Power Systems. July 23-26, 1991, Seattle , WA.

- Technical Program Chair
- Tutorial Chair
- Host Committee, Member
- Potentials & Challanges of Neural Network Applications to Power, Systems, Panel Member

◇ International Workshop on Artificial Neural Networks (IWANN ' 93), June 9-11, 1993, Barcelona, Spain , (sic) Programme Committee Member

◇ International Conference on Neural Networks (ICNN)

- 1988 San Diego ICNN, Program Committee Member
- 1993 San Francisco ICNN, Program Committee Member
- 1994 Perth ICNN, Technical Program Co-Chair

◇ International Joint Conference on Neural Networks (IJCNN)

- 1989 Washington D.C. IJCNN, January 1989, Planning Committee Member
- 1991 Singapore IJCNN, 18-21 Nov. 1991, Technical Program Committee Member
- IEEE Neural Networks President' s Forum, Moderator, at the 1991 Seattle IJCNN (Tuesday, July 9, 1991) - Presidents of Chinese, European, Japanese and Russian neural network professional societies - (presentation and panel discussion).
- 1992 Beijing IJCNN, November 1992, International Advisory Co-Chair.
- 1993 Nagoya (Japan) IJCNN, October 25-29, 1993.
  - † Program Committee Co-Chair
  - † Advisory Committee Member
- 2000 Como, Italy IJCNN, July 24-27, 2000 .
  - † Special Sessions Chair

◇ IEEE International Symposium on Circuits and Systems (ISCAS)

- 1987 ISCAS, Philadelphia (May 6, 1987), Artificial Neural Systems and Applications, Session Organizer and Co-Chair
- 1989 ISCAS, 9 May 1989, Portland., Neural Networks Session Chair
- 1994 ISCAS, London, Program Committee Member

- 1995 ISCAS, Seattle, General Chair
- 1996 ISCAS, Atlanta, Steering Committee Member

◇ New Zealand International Two-Stream Conference on Artificial Neural Networks and Expert Systems (ANNES)

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- Programme Committee -member; (ANNES '93), November 24-26, 1993, Otage University , Dunedin , New Zealand.
- International Programme Committee -member; (ANNES '94), November 20-23, 1995, University of Otago , Dunedin , New Zealand.

◇ International Conference of Neural Information Processing (ICONIP),

- ICONIP 1994, Seoul, Korea (International Advisory Committee)
- ICONIP '95, Oct 30 – Nov 3, 1995, Beijing, China, International Advisory Committee, Member

◇ American Mathematical Society

- 1051st AMS Meeting, Baylor University, October 16-18, 2009, Session Co-Organizer (with John Davis and Ian Gravagne): Dynamic Equations on Time Scales: Analysis and Applications.

◇ IEEE Symposium on Swarm Intelligence, Pasadena, March 2005 (Steering Committee Chair)

◇ National Faculty Leadership Conference (National CLM Meeting)

- June 24-27, 2004, Washington, D.C., The Christian World View in Engineering and Technology, Program Committee Chair

◇ Sixth International Symposium on Neural Networks (ISNN 2009) Wuhan, China, May 26-29, 2009, Advisory Committee Member.

◇ International Symposium on Intelligent Decision Technologies,

- IDT 2010, Baltimore, USA, 28-30 July 2010, International Programme Committee

◇ Texas Symposium on Wireless & Microwave Circuits & Systems, Baylor University, Waco, Texas

- April 4–5, 2013, Organization Chair
- March 26–27, 2014, Organization Chair
- April 23–24, 2015, Organization Chair
- March 31, April 1, 2016, Organization Chair

- 45th IEEE Southeastern Symposium on System Theory, March 10–12, 2013, Baylor University, Waco, Texas, Organization Chair.
- Other
  - Workshop on the Future Directions for Optical Information Processing, Texas Tech University , Lubbock (May 1980), Panel Discussion leader for "Space-variant coherent optical processing"
  - Limits of Passive Imaging Workshop, Mackinac Hotel, Mackinac Island, MI (May 24-26,1983), Chair of Processing Group
  - Workshop on Optical Artificial Intelligence, Gold Lake , Colorado (3-5 August, 1987), Chair of Working Group on Perception.
  - WVU Neural Network Symposium, West Virginia University , Morgantown , (15-16 June, 1989), Panel Discussion Member
  - First Workshop in Neural Networks, Auburn University Hotel & Conference Center, 5-6 February, 1990, Panel Discussion Member, "Application of neural networks and the future".
  - Conference on Active Materials and Adaptive Stuctures , Washington D.C., (Nov. 6-8, 1991), Session Committee Member
  - Annual IEEE Seattle Section Pizza Feed, February 20, 1991 , South Campus Center Auditorium, Master of ceremonies
  - Pacific Gas & Electric R&D Electric Distribution Program External Advisory Goup Meeting, Silverado Country Club, Napa Valley , California , (August 22-23, 1991).
  - Fuzzy Logic & Intelligent Systems Seminar, Boeing Computer Services, Red Lion Inn, Bellevue, WA, December 2, 1991, Panel Discussion: Moderator.
  - International Workshop on Artificial Neural Networks, June 9-11, 1993 , Sitges (Barcelona), Spain , Program Committee -member.
  - 1994 International Symposium on Speech, Image Processing & Neural Networks, (ISSIPNN'94) Hong Kong Convention & Exhibition Center April 14-16, 1994 (International Advisory Committee).
  - 1995 Workshop on Sampling Theory & Applications, September 20-22, 1995 , Jurmala (Riga), Latvia , Program Committee -member
  - 1996 IEEE International Workshop on Neural Networks for Identification, Control, Robotics and Signal/Image Processing (NICROSP), September 21-23, 1996, Venice, Italy, Program Committee -member
  - 30th International Symposium on Automotive Technology and Automation, Dedicated Conference on Megatronics, Florence Italy , 16-19 June 1997, Programme Committee member.
  - The Fourth International Conference on Neural Information Processing – The Annual Conference of the Asian Pacific Neural Network Assembly, jointly with

The Fifth Australian and New Zealand International Conference on Intelligent Information Processing Systems, and The Third New Zealand International Conference on Artificial Neural Networks and Expert Systems 24-28 November, 1997, Dunedin/Queenstown, New Zealand; program committee member.

- The IEEE International Electric Machines and Drives Conference (IEEE-IEMDC), 9-12 May, 1999, Seattle, WA , Publicity Chair & Publications Chair.
- American Scientific Affiliation (ASA) 64th Annual Meeting, Baylor University (Sunday, August 2, 2009), Session Chair (Origins).
- ACM Genetic and Evolutionary Computation Conference (GECCO), Vancouver, Canada on July 12-16, 2014, ACO-SI track program committee member
- Alternatives to Methodological Naturalism, Online Meeting - April 16, 2016, Advisory Panel
- International Conference on Big Data and Data Analytics (ICBDDA-17), sponsored by India's Institute for Engineering Research and Publication (IFERP), April 4-5, 2017 at Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya(SCSVMV) Kanchipuram, International Advisory Committee Member
- Alternatives to Methodological Naturalism Conference, April 16, 2016 Conference Advisory Panel, Member

6 Publications

6.1 Books

1. R.J. Marks II, Introduction to Shannon Sampling and Interpolation Theory, (Springer-Verlag, 1991, ISBN 0-387-7391-5 and 3-540-97391-5) Softcover reprint 2012. ISBN-10: 1461397103 ISBN-13: 978-1461397106.

2. M.A. El-Sharkawi and R. J. Marks II, Editors, Applications of Neural Networks to Power Systems, (IEEE Press, Piscataway, 1991). [TOC]

3. R.J. Marks II, Editor, Advanced Topics in Shannon Sampling and Interpolation Theory, (Springer-Verlag, 1993, ISBN 0-387-97906-9; 3-540-97606-9). Softcover reprint 2012. ISBN-10: 1461397596. ISBN-13: 978-146139759.

4. R.J. Marks II, Editor, Fuzzy Logic Technology and Applications, (IEEE Technical Activities Board, Piscataway, 1994, ISBN 0-7803-1383-6)

5. Jacek Zurada, R.J. Marks II and C.J. Robinson; Editors, Computational Intelligence: Imitating Life, (IEEE Press, 1994). [TOC]

6. Marimuthu Palaniswami, Yianni Attikiouzel, Robert J. Marks II, David Fogel and Toshio Fukuda; Editors, Computational Intelligence: A Dynamic System Perspective, IEEE Press, 1995, ISBN 0-7803-1183-5).

7. Russell D. Reed and R.J. Marks II, Neural Smithing: Supervised Learning in Feedforward Artificial Neural Networks, (MIT Press, Cambridge, MA, 1999.)

8. R.J. Marks II, Handbook of Fourier Analysis and Its Applications, Oxford University Press, (2009).

9. R.J. Marks II, M.J. Behe, W.A. Dembski, B.L. Gordon, J.C. Sanford, Editors Biological Information - New Perspectives, Cornell University (World Scientific, Singapore, 2013). [Cach]
DOI: 10.1142/9789814508728, ISBN-10: 9814508713,ISBN-13: 978-9814508711

10. R.J. Marks II, W.A. Dembski, W. Ewert, *Introduction to Evolutionary Informatics*, (World Scientific, Singapore, 2017).

6.2 Book Chapters

1977

1. R.J. Marks II, J.F. Walkup and M.O. Hagler "Volume hologram representation of space-variant systems," in Applications of Holography and Optical Data Processing edited by E. Marom, A.A. Friesem and E. Wiener-Aunear, Oxford: Pergamon Press, pp.105-113 (1977).

1979

2. R. J. Marks II, M. W. Hall, "Ambiguity function display using a single 1-D input," in SPIE Milestone Series: Phase Space Optics, Markus Testorf, Jorge Ojeda-Castaeda, and Adolf Lohmann, Editors, (The Society of Photo-Optical Instrumentation Engineers, Bellingham, WA, 2006) reprinted from Applied Optics Vol. 18 (15), pp. 2539-2540 (1979).

1984

3. R.J. Marks II and D.K. Smith "Gerchberg - type linear deconvolution and extrapolation algorithms," in Transformations in Optical Signal Processing, edited by W.T. Rhodes, J.R. Fienup and B.E.A. Saleh, SPIE vol. 373, pp.161-178 (1984)

1988

4. S. Oh, D.C. Park, R.J. Marks II and L.E. Atlas "Error detection and correction in multilevel algebraic optical processors," in SPIE Milestone Series: Selected Papers in Optical Computing edited by H. John Caulfield and G. Gheen, SPIE vol.1142, pp.59-64, 1989 (The Society of Photo-Optical Instrumentation Engineers, Bellingham, WA), reprinted from Optical Engineering, vol. 27, #4, pp.289-294 (1988).

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2011

33. Dr. Charles Baylis, Dr. Robert J. Marks II, Josh Martin, Loria Wang, Matthew Moldovan, and Hunter Miller, "Wirtinger Calculus as a Means to Assess and Improve Linearity and Efficiency in Radar Power Amplifiers," URSI National Radio Science Meeting, University of Colorado, Boulder, (January 4-6, 2011)

34. Josh Martin, Charles Baylis and Robert Marks II, "Using Wirtinger Calculus to Predict the Behavior of Time-Invariant Periodicity Preservation Systems," 2011 Mini-Symposium on Wireless and Microwave Circuits and Systems (WMCS), Baylor University, April 2011.

35. Matthew Moldovan, Charles Baylis and Robert Marks II, "Using Wirtinger Calculus to Predict the Behavior of Time Invariant Periodicity Preservation Systems," 2011 Mini-Symposium on Wireless and Microwave Circuits and Systems (WMCS), Baylor University, April 2011.

2012

36. Josh Martin, Matthew Moldovan, Charles Baylis, Robert J. Marks II, "Radar Power Amplifier Spectrum Optimization for Chirp Waveforms Using ACPR Load-Pull Measurements," The 2012 USNC-URSI National Radio Science Meeting, 4-7 January, Boulder, CO

37. Jon Roach,Robert J. Marks II, and Dr. Benjamin B. Thompson, "Tactical Task Allocation and Resource Management in Nonstationary Swarm," 2012 ONR University/Laboratory Initiative Program Review, University of Maryland University College, June 5-7, 2012

38. J. Martin, C. Baylis, R.J. Marks II, L. Cohen, and J. de Graaf "A Peak-Search Algorithm for Combined PAE and ACPR Load-Pull," Power Amplifier Symposium, San Diego, California, September 2012.

39. C. Baylis, J. Martin, M. Moldovan, R.J. Marks II, L. Cohen, and J. de Graaf, "Engineering Reconfigurable, Spectrally Confined Radar Systems," Department of Defense E3 Review (Environmental Electromagnetic Effects), Orlando, Florida, March 2012.

2013

40. Josh Martin, Charles Baylis, Robert J. Marks II, Lawrence Cohen, "Fast Load-Impedance Optimization to Reduce Spectral Spreading and Maximize Efficiency in Radar Transmitter Amplifiers," URSI National Radio Science Meeting, Boulder, Colorado, January 2013.

41. Charles Baylis, Matthew Moldovan, Matthew Fellows, David Moon, Robert J. Marks II, Lawrence Cohen "Radar Waveform Optimization to Reduce Spectral Spreading and Maximize Target Detection," URSI National Radio Science Meeting, Boulder, Colorado, January 2013.

42. Charles Baylis, Josh Martin, Matthew Fellows, David Moon, Robert J. Marks II, Lawrence Cohen, "Designing and Optimizing High-Efficiency Power Amplifiers to Meet Spectral Constraints in Radar Systems," 8th Annual Military Radar Summit, February 25 - 27, 2013, Ronald Reagan Building, Washington, District of Columbia

43. Jon Roach, Robert J. Marks, Benjamin B. Thompson. "Tactical Task Allocation and Resource Management in Nonstationary Swarm Dynamics," 2013 ONR University/Laboratory Initiative Program Review, Aloft National Harbor, MD June 4-6, 2013

44. Matthew Fellows, Charles Baylis, Josh Martin, Lawrence Cohen, and Robert J. Marks II, "Direct Fast Load-Pull Algorithm for PAE and ACPR Optimization," Wireless and Microwave Circuits and Systems, UCSD (2013).

2014

45. Robert Marks "Functional Information on and the Intelligent Design Theistic Evolution Dialogue," CSCA/ASA/CiS 2014 Conference, July 25-28, 2014, McMaster University, Hamilton, Ontario.

2015

46. Charles Baylis, Matthew Fellows, Joseph Barkate, Jennifer Barlow, Matthew Flachsbart, Lawrence Cohen, Robert J. Marks II, "The Smith Tube: Providing the Foundation for Real-Time, Spectrally Sensitive Circuit Optimizations." 2015 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting, URSI, July 19-24, 2015, Vancouver, BC

47. Dylan Eustice, Charles Baylis, Lawrence Cohen, Robert J. Marks II, "Mythbusting: Exploring Common Misconceptions about the Ambiguity Function." 2015 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting, URSI, July 19-24, 2015, Vancouver, BC

48. Matthew Fellows, Sarvin Rezayat, Jennifer Barlow, Joseph Barkate, Alexander Tsatsoulas, Charles Baylis, Lawrence Cohen, and Robert J. Marks II. "The Bias Smith Tube for Simultaneous Optimization of Power Amplifier Bias Voltage and Load Impedance," IEEE Power Amplifier Symposium, September 21-22 2015, San Diego, CA

49. Alexander Tsatsoulas, Matthew Fellows, Joseph Barkate, Charles Baylis, Lawrence Cohen and Robert J. Marks II. "Multidimensional Smith Tubes for Multi-Objective, Multi-Parameter Power Amplifier Design Optimization," IEEE Power Amplifier Symposium, September 21-22 2015, San Diego, CA

50. Joseph Barkate, Alexander Tsatsoulas, Matthew Fellows, Matthew Flachsbart, Charles Baylis, Lawrence Cohen, and Robert J. Marks II. "Momentum-Aided Search in the Power Smith Tube for Simultaneous Optimization of Power Amplifier Input Power and Load Impedance," IEEE Power Amplifier Symposium, September 21-22 2015, San Diego, CA

2016

51. Dylan Eustice, Charles Baylis, Lawrence Cohen, Robert J. Marks II. "Waveform Synthesis via Alternating Projections with Ambiguity Function, Peak-to-Average Power Ratio, and Spectrum Requirement," 2016 IEEE Radio & Wireless Week, Austin, Texas, USA, JW Mariott, Austin, 24-27 January, 2016

52. Joseph Barkate, Alexander Tsatsoulas, Matthew Fellows, Matthew Flachsbart, Charles Baylis, Lawrence Cohen, Robert J. Marks II. "Fast, Momentum-Aided Optimization of Transmitter Amplifier Load Impedance and Input Power for Cognitive Radio Using the Power Smith Tube," 2016 IEEE Radio & Wireless Week, Austin, Texas, USA, JW Mariott Austin, 24-27 January, 2016

53. Matthew Fellows, Sarvin Rezayat, Jennifer Barlow, Joseph Barkate, Alexander Tsatsoulas, Charles Baylis, Lawrence Cohen, Robert J. Marks II. "The Bias Smith Tube: Simultaneous Optimization of Bias Voltage and Load Impedance in Power Amplifier Design," 2016 IEEE Radio & Wireless Week, Austin, Texas, USA, JW Mariott Austin, 24-27 January, 2016

54. Eric Holloway and Robert Marks II, "High Dimensional, Human Guided Machine Learning," The Fourth AAAI Conference on Human Computation and Crowdsourcing (HCOMP 2016) October 30 - November 3, 2016, Austin, TX, USA.

2017

55. Matthew W. Fellows, Sarvin Rezayat, Alicia Magee, Charles Baylis, Lawrence Cohen, Robert J. Marks II, "OPTIMIZATION OF LOAD IMPEDANCE AND BIAS VOLTAGE FOR POWER-ADDED EFFICIENCY, DELIVERED POWER, AND ADJACENT-CHANNEL POWER RATIO USING THE BIAS SMITH TUBE." USNC-URSI National Radio Science Meeting, January 2017, Boulder, Colorado.

56. Zachary Hays, Lucilia Lamers, Charles Baylis, Robert Marks II, Ed Viveiros, Ali Darwish, John Penn, Abigail Hedden. "COMPARISON OF GAIN OPTIMIZATION TECHNIQUES ON RECONFIGURABLE POWER AMPLIFIERS WITH A REAL-TIME VARACTOR TUNING NETWORK." USNC-URSI National Radio Science Meeting, January 2017, Boulder, Colorado.

57. Charles Baylis, Robert J. Marks II, Liang Dong, Andrew Clegg, Lawrence Cohen. "DYNAMIC SPECTRUM COLLABORATION BETWEEN RADAR AND WIRELESS COMMUNICATION: A PROPOSED FRAMEWORK FOR THE SIMULTANEOUS OPTIMIZATION OF POLICY, NETWORKS, AND CIRCUITS." USNC-URSI National Radio Science Meeting, January 2017, Boulder, Colorado.

58. Casey Latham, Alicia Magee, Jacob Boline, Alexander Tsatsoulas, Matthew Fellows, Charles Baylis, Lawrence Cohen, Robert J. Marks II. "DUAL-LOOP JOINT CIRCUIT AND WAVEFORM OPTIMIZATION TECHNIQUE FOR AMBIGUITY FUNCTION, SPECTRAL PERFORMANCE, AND POWER EFFICIENCY." USNC-URSI National Radio Science Meeting, January 2017, Boulder, Colorado.

59. Charles Baylis and Robert J. Marks II. "Adaptive Amplifier Design for Dynamic Spectrum Allocation in the Next-Generation Radar," IEEE International Microwave Symposium, Hawaii Jun 9, 2017.

2018

60. Austin S. Egbert, Casey Latham, Pedro Rodriguez-Garcia, Charles Baylis, Lawrence Cohen, Robert J. Marks. "MULTI-DIMENSIONAL COEXISTENCE: EXTENDING THE CONCEPT OF THE SPECTRAL MASK TO INCLUDE TRANSMITTER TRANSMISSION PATTERN FOR SPECTRUM SHARING," USNC-URSI National Radio Science Meeting, January 2018, Boulder, Colorado.

61. Christopher D. Kappelmann, Lucilia Lamers, Zachary Hays, Sarvin Rezayat, Charles Baylis, Robert J. Marks, Ed Viveiros, Mohammad Abu Khater, Abbas Semnani, Dimitrios Peroulis "FREQUENCY-AGILE POWER AMPLIFIER MATCHING NETWORK RECONFIGURATION USING A HYBRID REAL-TIME SEARCH," USNC-URSI National Radio Science Meeting, January 2018, Boulder, Colorado.

62. Lucilia R. Hays, Charles Baylis, Robert Marks, Edward Viveiros "REAL-TIME TRANSISTOR STABILITY MEASUREMENTS USING THE ACCELERATION OF THE GAIN FOR THE NEXT GENERATION RADAR," USNC-URSI National Radio Science Meeting, January 2018, Boulder, Colorado.

63. Lucilia R. Hays, Sarvin Rezayat, Zachary Hays, Austin Egbert, Christopher Kappelmann, Charles Baylis, Robert J. Marks, Edward Viveiros, Dimitrios Peroulis, Mohammad AbuKhater, Abbas Semnani "DIRECT TUNING OF CAVITY POSITION NUMBERS FOR CIRCUIT OPTIMIZATION USING AN EVANESCENT-MODE CAVITY TUNER DESIGNED FOR RECONFIGURABLE RADAR TRANSMISSION," USNC-URSI National Radio Science Meeting, January 2018, Boulder, Colorado.

64. Sarvin Rezayat, Charles Baylis, Ed Viverios, John Penn, Robert J. Marks II "REAL-TIME MULTI-VARIABLE AMPLIFIER OPTIMIZATION USING A NONLINEAR TUNABLE VARACTOR MATCHING NETWORK IN THE POWER SMITH TUBE," USNC-URSI National Radio Science Meeting, January 2018, Boulder, Colorado.

2019

65. Austin Egbert, Kyle Gallagher, Charles Baylis, Anthony Martone, Ed Viveiros, Robert J. Marks II. "Effects of Time-Varying Transmit Amplifier Matching Networks in Cognitive Radar Applications," URSI National Radio Science Meeting, Boulder, Colorado, January 9-12, 2019.

66. I. N. Sandjaja, R. J. Marks II and K. E. Schubert, "HIGHLIGHT REMOVAL FROM EXTREMOPHILE IMAGES," *Mars Extant Life: What's Next*,NASA, Carlsbad, NM. Jan 29-Feb 1, 2019.

67. Angelique Dockendorf, Ellie Langley, Austin Egbert, Charles Baylis, Abbas Semnani, Dimitrios Peroulis, Anthony Martone, Ed Viveiros, Robert J. Marks II. "Frequency-Agile Reconfiguration for a High-Power Resonant Cavity Tuner Using Previous Search Results," URSI National Radio Science Meeting, Boulder, Colorado, January 9-12, 2019.

68. Austin S. Egbert, Kyle Gallagher, Charles Baylis, Anthony Martone, Ed Viveiros, Robert Marks, "EFFECTS OF TIME-VARYING TRANSMIT AMPLIFIER MATCHING NETWORKS IN COGNITIVE RADAR APPLICATIONS," 2019 USNC-URSI National Radio Science Meeting, University of Colorado at Boulder, January 9-12, 2019.

69. Gordon L. Ledford, Pedro Rodriguez-Garcia, Charles Baylis, Robert J. Marks "APPROACH FOR REAL-TIME SYNTHESIS OF SIMULTANEOUS RADAR AND SPATIALLY SECURE COMMUNICATIONS FROM A COMMON PHASED ARRAY," 2019 USNC-URSI National Radio Science Meeting, University of Colorado at Boulder, January 9-12, 2019.

70. Charles Baylis, Anthony Martone, Kyle Gallagher, Ed Viveiros, Abbas Semnani, Dimitrios Peroulis, Robert J. Marks II, "SOFTWARE DEFINED, SPECTRALLY SENSITIVE RADAR TRANSMISSION," 2019 USNC-URSI National Radio Science Meeting, University of Colorado at Boulder, January 9-12, 2019.

71. Jose A. Alcala-Medel, Caleb Calabrese, Charles Baylis, Anthony Martone, Kyle Gallagher, Ed Viveiros, Abbas Semnani3, Dimitrios Peroulis, "FAST RECONFIGURATION OF SECOND-GENERATION TUNABLE EVANESCENTMODE CAVITY MATCHING NETWORK FOR FREQUENCY AGILITY IN S-BAND COGNITIVE RADAR APPLICATIONS," 2019 USNC-URSI National Radio Science Meeting, University of Colorado at Boulder, January 9-12, 2019.

72. Ellie Langley, Austin Egbert, Charles Baylis, Abbas Semnani, Dimitrios Peroulis, Anthony Martone, Ed Viveiros, Robert Marks II, Angelique Dockendorf, "FREQUENCY-AGILE RECONFIGURATION FOR A HIGH-POWER RESONANT CAVITY TUNER USING PREVIOUS SEARCH RESULTS," 2019 USNC-URSI National Radio Science Meeting, University of Colorado at Boulder, January 9-12, 2019.

6.7 Selected Talks

1988

1. Les Atlas and R.J. Marks II, Introduction to Artificial Neural Systems, College of Engineering, University of Washington, Seattle, September 15-16, 1988 (video made available from AMCEE or the College of Engineering , University of Washington).

1990

2. R.J. Marks II, "Shannon Sampling and Interpolation Theory," UW course offering recorded Spring Quarter, 1989 and Spring Quarter, 1990 (video made available from AMCEE.)

3. Artificial Neural Systems, Ireste University in Nantes France (tutorial), March 5-30, 1990.

1991

4. Neural Networks and Their Applications to Power Engineering, Power Industry Computer Applications (PICA) Conference, Baltimore, MD, May 6, 1991 (with R. Eberhart and M.A. El-Sharkawi)

5. Artificial Neural Networks in Electric Power Systems (tutorial), Decisions Systems International, Monaco, July 1-3, 1991 (with M.A. El-Sharkawi).

6. Neural Networks Tutorial, First International Forum on Applications of Neural Networks to Power Systems (tutorial), Seattle, WA, July 23, 1991 (with R. Thomas and H. Mori).

7. Auditory Neural Systems and Time-Frequency Theory, IEEE Conference on Neural Networks for Ocean Engineering (tutorial), Washington D.C., August 15-17, 1991 (with L.E. Atlas).

1992

8. Artificial Neural Networks in Electric Power Systems (tutorial), Decisions Systems International, Madrid, Spain , September 7-11, 1992 (with M.A. El-Sharkawi).

1993

9. B.G. Song, R.J. Marks II, S. Oh, P. Arabshahi, T.P. Caudell and J.J. Choi, "Adaptive membership function fusion and annihilation," Fuzzy Logic and Neural Networks: Clips from the Field (FUZZ-IEEE '93), San Francisco, March 1993.

1996

10. Artificial Neural Networks: Supervised Models (tutorial), 1996 Winter Meeting, IEEE Power Engineering Society January 24, 1996, and Summer Meeting, IEEE Power Engineering Society, July 31, 1996, Denver, CO .

1997

11. R.J. Marks II, "Artificial Neural Networks: Supervised Models, in Artificial Neural Networks With Applications to Power Systems," El-Sharkawi and Niebur, Editors, IEEE Educational Activities Board, (ISBN: 0-7803-4008-6) 1997. https://youtu.be/boQcs-7PdOg

12. Modern Neural Networks: The First Decade (tutorial), IV Escola de Redes Neurais, Florianopolis , Brazil, July 21, 1997.

1999

13. Diagnostics and Control of Electric Machines Using Computational Intelligence (tutorial) IEEE IEMDC'99. International Electric Machines and Drives Conference. May 9, 1999 Seattle , Washington, USA (with M.A. El-Sharkawi).

2000

14. An Introduction to Fuzzy Inference (tutorial), IEEE PES Summer Meeting 2000, Seattle , WA.

2001

15. R.J. Marks II, *Probability and Random Processes* (YouTube)
    - ◇ Lecture 1, YouTube: http://youtu.be/SEoH-51EzaM
    - ◇ Lecture 2, YouTube: http://youtu.be/l5gMUK-Toj4
    - ◇ Lecture 3, YouTube: http://youtu.be/muVqs9tJ8Ck
    - ◇ Lecture 4, YouTube: http://youtu.be/_B1MYUPu95o
    - ◇ Lecture 5, YouTube: http://youtu.be/iHbNnXqf1Sg
    - ◇ Lecture 6, YouTube: http://youtu.be/oSyACKCkJJc
    - ◇ Lecture 7, YouTube: http://youtu.be/Q_d-NF8_px4
    - ◇ Lecture 8, YouTube: http://youtu.be/lYgce7JHZ1w
    - ◇ Lecture 9, YouTube: http://youtu.be/mZ75uM6YZLk
    - ◇ Lecture 10, YouTube: http://youtu.be/dJPNHfcFC9I
    - ◇ Lecture 11, YouTube: http://youtu.be/CO59JL9Z_0k
    - ◇ Lecture 12, YouTube: http://youtu.be/E07nr-flg8E
    - ◇ Lecture 13, YouTube: http://youtu.be/-ZV1J3Hv6dE
    - ◇ Lecture 15, YouTube: http://youtu.be/jQXMsi_pKFo
    - ◇ Lecture 16, YouTube: http://youtu.be/ph1lCDc-1UE
    - ◇ Lecture 17, YouTube: http://youtu.be/j6XaLQkcee8
16. Neural Networks: The Fundamentals (tutorial), Buryat State University, Ulan-Ude, Russia, March 5, 2001.

2002

17. R.J. Marks II, *Introduction to Computational Intelligence* (YouTube)
    - ◇ Lecture 1, YouTube: http://youtu.be/fgtUFzxNztA
    - ◇ Lecture 2, YouTube: http://youtu.be/8RrBmnFufn4
    - ◇ Lecture 3, YouTube: http://youtu.be/PCyBEy_22F4
    - ◇ Lecture 4, YouTube: http://youtu.be/I_Oj1qe8jO4
    - ◇ Lecture 5, YouTube: http://youtu.be/OWKzDmXV1-
    - ◇ Lecture 6, YouTube: http://youtu.be/WW4sMx1-cC0
    - ◇ Lecture 7, YouTube: http://youtu.be/MVHiE0NS5hY
    - ◇ Lecture 8, YouTube: http://youtu.be/1sp-OHr4_YA
    - ◇ Lecture 9, YouTube: http://youtu.be/EyHHxP5UHcE
    - ◇ Lecture 10, YouTube: http://youtu.be/BzUZRtwAaBs
    - ◇ Lecture 11, YouTube: http://youtu.be/RXHq7B0-V9s
    - ◇ Lecture 12, YouTube: http://youtu.be/Ef7seYvoFFc
    - ◇ Lecture 13, YouTube: http://youtu.be/rDsLmikMjG
    - ◇ Lecture 14, YouTube: http://youtu.be/XOOpDhkX_k8
    - ◇ Lecture 15, YouTube: http://youtu.be/pJh3dWLSigM
    - ◇ Lecture 16, YouTube: http://youtu.be/LSXKLtqJ8a8
    - ◇ Lecture 17, YouTube: http://youtu.be/FK33Lj382KI
    - ◇ Lecture 18, YouTube: http://youtu.be/i2SHIXdHgC0
    - ◇ Lecture 19, YouTube: http://youtu.be/j6-dcqivT0w

2003

18. "Perceptron Inversion: Properties and Applications", Institute of Engineering Cybernetics, Wroclaw University of Technology , Wroclaw , Poland (April 3, 2003).

19. "Fundamentals of Swarm Intelligence", APL Invited Colloquia, Applied Physics Laboratory, University of Washington (April 10, 2003).

20. "What Does Calculus Have to Do With Christianity?" San Jose State University, November 30, 2003.

21. "Swarm Intelligence: The Method Behind the Mobs", NASA Office of Biological and Physical Research Program Review, California Institute of Technology, December 17-18, 2003.

2004

22. "Time Scale Nonregressivity in Switched Linear Circuits" Special Session on Dynamic Equations on Time Scales: Theory and Applications, AMS Western Sectional Meeting, University of Southern California, Los Angeles, CA, April 3-4, 2004 (with Ian Gravagne, John M Davis, Jeffrey J DaCunha).

2006

23. "Added Information in Targeted Evolutionary Search", Perry Conference, Hotel Pattee, Perry, Iowa, April 17-20, 2006.

24. "Evolutionary Search: A Free Source of Design Information?" RAPIDS 2 Conference, BIOLA, May 11-13, 2006.

25. "Science and the Bible: The Emerging Harmony," CDIS (Chengdu International School), Chengdu, China (May 29, 2006) and CaiDa Southwest Economics University, Chengdu, China (May 30, 2006) .

26. "Computational Intelligence: A Free Source of Information?" International Symposium on Neural Networks (ISNN), Chengdu, China (May 29, 2006) A Keynote Talk

2007

27. "The Need for Active Information in Evolutionary Search," Wistar Retrospective Symposium, Boston, MA (June 3-6, 2007).

28. "Gödel to Turing to Chaitin to the Edge of Naturalism: Some Things Computers Will Never Do," B.E.A.R.S. Seminar, Baylor University, (September 28, 2007).

29. Introduction to Evolutionary Informatics (tutorial), Discovery Institute Summer Symposium, Seattle, WA., July 2007.

30. "Conservation of Information in Evolutionary Search Algorithms: Measuring the Cost of Success," University of Missouri, Columbia, (November 12, 2007). IEEE CIS Distinguished Lecture for Columbia Chapter of IEEE CIS Society.

2008

31. "Gödel to Turing to Chaitin to the Edge of Naturalism: Some Things Computers Will Never Do," (April 2, 2008), SWBS, IEEE CIS Distinguished Lecture for Dallas Chapter of IEEE CIS Society.

32. "What does Calculus have to do with Christianity?" SMU DCL for Faculty Commons (September 25, 2008).

33. "Measuring the Cost of Success: Conservation of Information in Evolutionary Search Algorithms," Southern Methodist University (SMU), Department of Electrical Engineering (September 25, 2008).

34. "Knowing What is Unknowable: Things a Computer Can't Do," Baylor American Scientific Affiliation (ASA) Student Chapter. Also sponsored by the Baylor Society for Conversations in Religion, Ethics and Science, Baylor University (April 15, 2008).

35. "What does Calculus have to do with Christianity?" Dallas Christian Leadership (DCL) at SMU for Faculty Commons (September 25, 2008).

2009

36. "Evolutionary Informatics: Measuring the Cost of Success," American Scientific Affiliation (ASA) 64th Annual Meeting, Baylor University (Sunday, August 2, 2009) with William A. Dembski

37. "Science & Christianity: Separate but Equal?" Covenant Presbyterian Church, Austin, TX (August 16, 2009)

38. "Lessons from Gödel, Turing and Chaitin: Things Computational Intelligence Will Never Do," IEEE MetroCon 2009, Innovating for Society, August 17th, 2009, Sheraton Arlington, Arlington, Texas. (IEEE CIS Distinguished Lecture.)

39. "God Ever Geometrizes: Apologetics in Mathematics," Baylor American Scientific Affiliation (ASA) Student Chapter. Also sponsored by the Baylor Society for Conversations in Religion, Ethics and Science, Baylor University (December 1, 2009).

40. Information and Evolution (tutorial), Discovery Institute Summer Symposium, Seattle, WA., July 2009.

41. R.J. Marks II, "Great Expectations: Information Theory," for Ricochet.com. http://youtu.be/Uc6Ktq0SEBo

2010

42. "Gödel to Turing to Chaitin to the Edge of Naturalism: Some Things Computational Intelligence Will Never Do," IEEE CIS Distinguished Lecture for St. Louis Chapter of IEEE CIS Society presented at the Missouri University of Science and Technology, Rolla, Mo., April 13, 2010.

43. "Measuring the Cost of Success: Conservation of Information in Search," IEEE CIS Distinguished Lecture for St. Louis Chapter of IEEE CIS Society presented at the Missouri University of Science and Technology, Rolla, Mo., April 13, 2010.

44. "Time Scale Discrete Fourier Transforms," Guest Lecture, Missouri University of Science and Technology, Rolla, Mo., April 14, 2010.

45. "God Ever Geometrizes: Apologetics in Mathematics," Probe Ministries, Plano, Texas, (June 28, 2010).

46. "Spectrum Issues in Amplifier Design," Fifth Annual Emerging Spectrum Technology (EST) Workshop on Advanced Radar Technologie to Improve Spectrum Use, Double Tree Hotel, Annapolis Maryland, September 13-14, 2010 (with Charles Baylis).

2011

47. "Power Amplifier Circuit and Waveform Optimization for Reduced Spectral Spreading in Radar Transmitters," IDGA's 4th Annual Military Radar Summit, Feb 8-10, 2011, Vienna, VA (with Charles Baylis).

48. "Evolutionary Simulations and Sources of Active Information," Discovery Retreat, Santa Barbara, CA (March 1-4, 2011)

49. "Measuring Cross Harmonic Coupling in Nonlinear Systems," WMCS Advisory Board, March 31, 2011, Baylor University.

50. "Evolutionary Informatics. Why all the fuss?" Baylor Alumni Association, Lifelong Learning in Retirement, April 15, 2011, Great Hall of the Hughes-Dillard Alumni Center, Waco, Texas

51. "Evolution Models Do Not Create Information," Great Expectations Conferences, Borgo Finocchieto, Tuscany, Italy, June 12-16, 2011 (with Winston Ewert).

52. Power Amplifier Circuit and Waveform Optimization for Reduced Spectral Spreading in Radar Transmitters (tutorial), 4th Annual Military Radar Summit, Washington, D.C., February 79, 2011 (with Charles Baylis)

53. Why Design Information is Required to Find Improbable Complex Targets, Discovery Institute Summer Symposium, Seattle, WA., July 2011.

2012

54. "Information: What Is it?," January 17, 2012. [Youtube: https://youtu.be/d7seCcS_gPk], [Cache.]

55. "CHRISTIAN CALCULUS: The Impact of Christian Faith on Mathematics & Science Yesterday & Today," Sept 27, 2012 (sponsored by Baylor's ESC LLC and the Baylor Student Chapter of the American Scientific Affiliation)

56. "Joint Optimization of Radar Power Amplifier and Waveforms for Reduced Spectral Spreading," North Atlantic Treaty Organization (NATO) SET-182 Research Task Group Meeting, 2012 October 17-18, 2012 (with Charles Baylis. Remote Presentation.)

57. "Information. What is it?," Intro. to Engineering Lecture, January 17, 2012. http://youtu.be/d7seCcS_gPk

58. "God Ever Geometrizes: Apologetics in Mathematics" November 6, 2012, Texas A&M University, (sponsored by TAMU's Ratio Christi student group)

2013

59. "Information: Measuring Design & Understanding the Unknowable," 2013 National Conference & Ratio Christi Symposium, Southern Evangelical Seminary, October 11-13 2013, Matthews, North Carolina

2014

60. "Spectral Issues," Spectrum Forum, Texas Symposium on Wireless and Microwave Circuits and Systems, Baylor University, Waco (April 4, 2014)

61. "Electrical & Computer Engineering," Lorena High School, Lorena, Texas (Career Day) May 30, 2014 (with Charles Baylis and Matthew Fellows)

62. "The Impact of Christian Faith on Mathematics & Science: Yesterday & Today," (See Videos: page 81, item 65)

63. "Dr. Robert Marks: Active Information in Metabiology," May 30, 2014
http://youtu.be/tJSJg0IZtfI

64. "On Algorithmic Specified Complexity," by Robert J. Marks II. CSCA/ASA/CiS 2014 Conference, July 2014, McMaster University, Hamilton, Ontario, Published on Aug 5, 2014
http://youtu.be/No3LZmPcwyg

65. "The Impact of Christian Faith on Mathematics & Science: Yesterday & Today," Baylor Student Chapter of the American Scientific Affiliation, October 12, 2014
http://youtu.be/hdNNNJMZJ_c

66. "Alternating Projections onto Convex Sets Examples,"
https://youtu.be/_-T4Y0aof3s

2015

67. "Seven Things Not To Do With Electricity." Baylor Student IEEE Group, April 13, 2015.
https://youtu.be/BzeHgmW5xfI

68. "2015 IEEE Radar Conference Tutorial: Radar Transmitter Design for the Crowded Radio Spectrum" May 10, 2015, Texas Symposium
https://youtu.be/vrmN_2kQ8Cs

69. "Information: What Is It Anyway?" ID the Future Podcast, November 9, 2015
https://youtu.be/c2UCPX5mKio

70. Radar Transmitter Design for the Crowded Radio Spectrum (tutorial), 2015 IEEE International Radar Conference (RadarCon), Crystal City, Arlington, VA. May 10, 2015 (with Charles Baylis & Lawrence Cohen)

71. Radar in a Communications-Driven Spectrum: Innovative System, Component, and Circuit Design for the Evolving Spectrum Environment (tutorial), International Microwave Symposium, May 22, 2015, Phoenix, AZ (with Charles Baylis & Lawrence Cohen)

72. "Adaptability and Reconfigurability: Radar Operational Infrastructure Redux," DARPA Radar/Communications Co-Design Challenge, DARPA, Crystal City, VA (April 27, 2015)

73. "Effects of Power Amplifier Nonlinearities on the Radar Ambiguity Function." 2015 IEEE International Radar Conference (RadarCon), Arlington, VA. May 10, 2015

74. "Ambiguity Functions and Spectral Constraints." International Microwave Symposium, May 22, 2015, Phoenix, AZ

75. "2015 IEEE Radar Conference Tutorial: Radar Transmitter Design for the Crowded Radio Spectrum" May 10, 2015, Texas Symposium

76. Small Group Apologetics

    #1: Scientists & Their Faith
    YouTube: https://youtu.be/tpKK83Xr__s

    #2: The Origin of Life
    YouTube: https://youtu.be/iELmvoAsgzk

    #3: The Origin of Life: No Natural Explanation
    YouTube: https://youtu.be/WxItsmEHu_g The Origin of Life: No Natural Explanation

    #4: Evolution A
    YouTube: https://youtu.be/Un8F0idwx1Y

    #5: Evolution B & Where is God Math
    YouTube: https://youtu.be/Wgw9uYgq3Jo

77. "Science, Faith & Belief in God," Bridges International, Decemeber 31, 2017. [YouTube: https://youtu.be/J1rWonYk6EE]

78. "Evo-Info: Algorithmic Information Theory & Why Automata Will Never Create Information," Origin of Biological Information, Aug 19-21, Canaan Valley Resort, Davis, WV). [Youtube: https://youtu.be/RCWJXlIH7ZU].

79. "POCS: Alternating Projection onto Convex Sets Tutorial" (2016)

    (a) YouTube: Lecture #1, https://youtu.be/ooIphlOOzcE
    (b) YouTube: Lecture #2, https://youtu.be/xczjmF1j2Z0
    (c) YouTube: Lecture #3, https://youtu.be/zP7jj3iUfso

2018

80. "AI and Human Uniqueness" 2018 Discovery Summer Seminars, Seattle Pacific University, July 12, 2018, 7-9 PM, Seattle, Wa.

7 Research Grants & Contracts

1. "Lensless space-variant processing," Graduate School Research Fund (1978-79), $5,824.
2. "Coherent optical extrapolation of two-dimensional bandlimited signals," National Science Foundation (1979-81), $32,000.
3. "Coherent optical interpolation of continuously sampled images," Graduate School Research Fund (1982-83), $6,596.
4. AT&T Research Equipment Grant (1985)...with L.E. Atlas, $62.000. "Analysis and application of neural nets," Boeing High Technology Center (1986-88).with L.E. Atlas-$110,000.
5. 'Neural network computer architectures," The Washington Technology Center (1987-89) with L.E. Atlas.
6. "Increasing the accuracy of inexact processors," SDI/IST through ONR & the Optical Systems Lab at Texas Tech University and WTC (1988-1989), $230,000.
7. "Power Systems Stability and Security Assessments Using Artificial Neural Networks" NSF (1988-1990), Project Coordinator, co P.I. with M.A. El-Sharkawi, M. Damborg & L.E. Atlas-$337,500.
8. "Neurocomputers," The Washington Technology Center (1989-91) with L.E. Atlas, $150,000.
9. "Electric load forecasting using artificial neural networks," Puget Sound Power and Light Company (1989-90) with M. El-Sharkawi, L.E. Atlas & M. Damborg-$115.000.
10. "Advanced Time-Frequency Displays," Boeing Commercial Airplane Company, September 1, 1989 through October 30, 1990, co-P.I. with Les Atlas-$128,000.
11. "Neural Network & Learning Systems," The Washington Technology Center (1991-92) with L.E. Atlas, $150,000.
12. "Solution of Inverse Problems in Electromagnetic and Optical Propagation Using Artificial Neural Networks," National Science Foundation, February 15, 1991 to February 14, 1993, (with Jenq-Neng Hwang, Leung Tsang and Akira Ishimaru),-$151,000.
13. "Advanced Neural Network Paradigms and Applications," Boeing Computer Services, January 1, 1991 to December 31, 1993-$90,000.

14. "Simulation Studies on Biomagnetic Detection of Bundle of His Signal and Its Application to the Cardiac Syncope Problem," General Electric, Schenectady NY, January 1, 1992 to May 31, 1992, co Principal Investigator (Lee Huntsman, Project Coordinator; with co PI's G.H. Bardy, C. Ramon, S.Oh)-$40,000.

15. "Biomagnetic Imaging of Three-Dimensional Current Distribution," National Science Foundation, Stage 1: 6-1-92 to 5-31-95. (co PI with C. Ramon)-$497,080.

16. Ibid. Stage 2: $104,358, 6-1-94 to 2 29, 1996

17. "Detection of Short Turns in Turbo Alternators," Southern California Edison, August 1, 1992 to July 31, 1993, (co Principal Investigator M.A. El-Sharkawi)-$93,765.

18. "S&P 500 Trading Using Spectrally Trained Neural Networks," Washington Technology Center, January 1993 to June 1993, $25,000.

19. "Tune & Prune Adaptation of Fuzzy Inference Engines," Royalty Research Fund, University of Washington, June 15, 1993 to September 1994, $14,000.

20. "Localization of Short Turns in Turbo Alternators," Southern California Edison, August 1, 1992 to July 31, 1993, (co Principal Investigator M.A. El-Sharkawi)-$94,000.

21. 'Financial Neural Networks," Washington Technology Center, August 1993 to March 1994, $10,000.

22. "Detection of Short Turns in Operating Turbo Alternators," Southern California Edison, August 1, 1993 to August 31, 1994, (co Principal Investigator M.A. El-Sharkawi)-$93,000.

23. "Advanced Neural Network Paradigms and Applications," Boeing Computer Services, January 1, 1994 to December 31, 1996-$90,000.

24. "Wavelet Based Neural Networks," Washington Technology Center, January 1995 to June 1995, $7,000.

25. "Genetic Algorithm Carbon Brake Analysis," Boeing Airplane Company, September 1994 to December 1994, $23,000.

26. "Under-Load Evaluation of Breaker Contacts Condition," National Science Foundation, GOALI Grant No.ECS-9634600, September 1, 1996 to August 31, 1997, (Co-PI with Mohamed A. El-Sharkawi in collaboration with Isador Kerszenbaum, Southern California Edison), $50,000.

27. "Intelligent Systems Applications for Transmissions and Distribution Systems," (Co-PI with Mohamed A. El-Sharkawi), Southern California Edison, 1996-97, $79,530.

28. "Advanced Neural Network Paradigms and Applications," Boeing Computer Services, January 1, 1996 to December 31, 1997-$23,000;

29. Ibid. 1997-98 $23,000;

30. Ibid. 1998-99 $23,000.

31. "UG Cable Replacement," Southern California Edison, 1997 - $50,000 (Co-PI with Mohamed A. El-Sharkawi).

32. "Twin signal signature sensing: application to shorted winding monitoring, detection and localization," NSF/EPRI, 1995-1999, (co Principal Investigator M.A. El-Sharkawi), $398,000.

33. "Environmentally Adaptive Sonar," Office of Naval Research/ Applied Physics Laboratory, September 1997 to September 1999 - $90,000 (Co-PI with Mohamed A. El-Sharkawi).

34. "A New Paradigm for Designing Radiation Beams for Cancer Treatment," The Whitaker Foundation, January 1998 to December 2000 - $210,000 (Co-PI with Paul Cho, Department of Radiation Oncology, UW School of Medicine.)

35. "Automatic Decision Aggregation," Boeing Defense, Nov 1997 through May 1998, $26,000.

36. 'Automatic Environmentally Adaptive Sonar Control," Office of Naval Research, 1998-2001, - $333,000 (Co-PI with M.A. El-Sharkawi).

37. "Assessment of prostate seed implants NIH, October 1, 2001 to Dec 31, 2002 (Co-PI with Paul Cho, Department of Radiation Oncology, UW School of Medicine.), NIH, $212,000.

38. "Sensor Coverage for Vehicle Health and Safety Systems," Boeing Defense, June 2001 to Dec. 2001 (PI $25,000).

39. "Intelligent Sensor and Satellite Networks for Earth Science & Exploration," JPL & NASA Sept 1, 2000 to Dec 31, 2002 (co PI with M.A. El-Sharkawi, subcontract from JPL for $250,900.)

40. "Model-Based Complex Data Set Correlation Boeing Airplane Company, Jan 16, 2001 to Jan 16, 2002, (PI $42,099)

41. "Physiologic Development of Speech Production," NIH, Sept 1, 2001 to Sept 2006 (PI. Christopher A. Moore, Speech & Hearing Sciences. R.J. Marks II is a co-investigator, Grant Total is $2,861,174.).

42. "Reconstruction of Missing Sensor Readings on Jet Aircraft Engines," Boeing Phantom Works, September 2001 to May 2002 ($32,000).

43. "Missing Sensor Data Restoration: Computationally Intelligent Discovery of Reading Dependencies," NSF, Sept 16, 2001 to Aug 31, 2004, (co-PI with M.A. El-Sharkawi, $588,898).

44. Ibid. Undergraduate support addendum, $12,000.

45. "Intraoperative Dose Optimization for Prostate Brachytherapy," ARO, co-PI with Paul Cho and Y. Kim. $550,000, 2003-06 (3 years).

46. "Application of computationally intelligence techniques to long term multistatic sonar systems (ONR - EE/APL, 3 years, Marks Co-PI) $960k total.

47. "Collective Behavior of Biological Swarms: System Modeling, Analysis, and Algorithmic for Distributed Dynamic Resource Allocation Problems," JPL Director's Research and Development Fund, Jet Propulsion Laboratory, Co-PIs are Payman Arabshahi (JPL), R.J. Marks II (UW), Michael Dickinson (Cal Tech) and Alcherio Martinoli (Cal Tech), 2003-04, $200,000.

48. "Reconstruction of Missing Sensor Readings on Jet Aircraft Engines: Phase II," Boeing Phantom Works, April 2003 to July 2003, ($32,000),

49. "Supplemental RA Support," Applied Physics Lab, University of Washington, Spring Quarter, 2003, ($11,138).

50. "Real-Time Distributed Control Networks: Dynamic Bandwidth Allocation via Adaptive Sampling" (with Ian Gravagne and John Davis, Baylor University) NSF, 3 years, $311k.

51. Ibid. Supplemental REU funds obtained for supporting summer undergraduate research ($15,000).

52. "Mu-Dynamics on Time Scales: Adaptive Time Domains for Dynamical Systems," (with Ian Gravagne and John Davis, Baylor University) NSF, 3 years, $143k.

53. "Multi-Agent System Based Intelligent Distributed Control System for Power Plants," (with Kwang Y. Lee, P.I. and Ian Gravagne), 2008–2011, $132k.

54. "Inversion of Swarm Dynamics for Underwater Tactical Applications," Office of Naval Research, 2009–2011, $270,000 (with Benjamin B, Thompson, ARL Penn State)

55. "Joint Optimization of Radar Power Amplifier and Waveforms for Reduced Spectral Spreading," ARL (Chales Baylis, P.I.) $62,000.

56. "Tactical Task Allocation and Resource Management in Nonstationary Swarm Dynamics," Office of Naval Research, 2012–2013, $270,000 (with Benjamin B, Thompson, ARL Penn State)

57. "Evaluation of Airport Wireless Interference Assessment and Comparison with University Campus Wireless Coexistence," TEM Consulting, (Charles Baylis, P.I., R.J. Marks co P.I.) $2000, Sept 19, 2013 to Sept 20, 2014.

58. "EARS: Joint Circuit and Waveform Optimization for Cognitive, Spectrally Confined Radar Transmission ," National Science Foundation, (Charles Baylis, P.I., R.J. Marks co P.I.) $400,000. October 1, 2013 to September 30, 2017.

59. Ibid. Supplemental $16,000 Research Experiences for Undergraduates (REU) awarded 2015. Supplemental $16,000 Research REU awarded 2016.

60. "Reconfigurable Power Amplifier and Filter Technology for Real-Time Adaptive Next Generation Radar," Army Research Laboratory, (Charles Baylis, P.I., R.J. Marks co P.I.) $855,453.19, May 11, 2016 to December 11, 2017

61. Ibid. $280K Continuance, 5/13/2018 to 5/17/2020

62. "Investigation of Wideband Low-Noise Amplifier Linearity in Receiver Interference Scenarios," Raytheon, January 1, 2016 August 31, 2016, (Charles Baylis, P.I., R.J. Marks co P.I.) $9,972 (2016-2017).

63. "Business Intelligence: Application to Influence Metrics," Influence Networks, June 15, 2017 through July 31, 2017, $16,115.

64. "Testing Theories of Entrepreneurship: Agent and Swarm Based Models of Entrepreneurial Behavior and Outcomes." June 2017 - December 2017 (with Steve Bradley) Bough Grant, $3500.

65. "Artificial and Natural Intelligence: Identifying & Applying the Difference," Discovery Institute, 2018-2021, $288,790.

66. "Enabling Quantum Leap: Q-AMASE-i: Convergent Acceleration Discovery Foundaries for Quantum Materials," $12,984,527, Sept 1, 2019 to Aug 30, 2025, NSF, (Marlin Scully, Baylor University, PI)[10]-In Review.

8 Courses Taught

8.1 Baylor University

1. EGR 3335, Signals & Systems
2. EGR 5001, Baylor Engineering & Research Seminars
3. ELC 5358, Introduction to Computational Intelligence
4. ELC 5354, Random Signals & Noise
5. ELC 5351, Multidimensional Signal Processing
6. ELC 5370, Introduction to Information Theory

[10] I am listed as a collaborator, compensation TBD on award.

8.2 University of Washington

1. EE 306, Elements of Electrical Engineering
2. EE 310, Electronics Laboratory
3. EE 235, Circuits & Systems I
4. EE 333, Circuits & Systems II
5. EE 335, Linear Systems Analysis I
6. EE 381, Electrophysics I
7. EE 383, Electrophysics II
8. EE 416, Random Signals for Communications and Signal Processing
9. EE 417, Introduction to Communication Theory I
10. EE 418, Introduction to Communication Theory II
11. EE 341, Discrete Time Linear Systems
12. EE 440, Linear Systems Analysis II
13. EE 446, Control Systems Analysis
14. EE 468, Fourier Optics & Holography
15. EE 500, Graduate Seminar
16. EE 505, Introduction to Probability & Random Processes
17. EE 508, Stochastic Processes
18. EE 518, Digital Signal Processing
19. EE 521, Multidimensional Signal Processing
20. EE 522, Shannon Sampling & Interpolation Theory
21. EE 523, Signal Analysis
22. EE 559, Computational Neural Networks
23. EE 579, Advanced Topics in Electromagnetics
24. EE 595, Introduction to Fuzzy Systems
25. EE 595, Advanced Topics in Communication Theory

8.3 Student Comments

Reviews are not taken for every class.

2004

1. Introduction to Computational Intelligence, Spring 2004

   "Your enthusiasm and sense of humor add so much to the class. Baylor is so lucky to have you! "

   "Very enthusiastic. Makes learning the material fun."

2. Random Variables and Stochastic Processes, Fall 2004

   "Very gregarious and jovial about the subject matter Clearly an expert in his field."

   "Colorful, yet demented pictures"

2005

3. Multidimensional Signal Processing, Spring 2005

   "Awesome Professor!"

   "(Marks) is an awesome teacher."

   "His enthusiasm (contributed most)."

   "Incredible knowledge about subject material."

   "His presentations are entertaining. I love him."

2007

4. Random Variables and Stochastic Processes, Fall 2005

   "[Dr. Marks] is always excited about the material."

   "[Dr. Marks] doesn't have problems answering questions asked."

   "Good attitude. Really cared about his students. Give the man a raise."

   "[Dr. Marks shows] humor [and] excitement in the course and the material. He needs a raise."

"[Dr. Marks] makes sure the students learn the material."

5. Signals & Systems, Autumn 2007

"... in my four years at Baylor, I have not taken a course by a better professor. He is a pleasure to learn from, and though his class is hard work, he relates it to the real world and makes it viable and interesting. Would take [another course] from him in a heartbeat."

"Dr. Marks is the best professor I have had at Baylor hands down. He always keeps the class engaging and enjoyable to be in. He goes above and beyond the material of the course to make it more interesting but still manages to clearly explain course material and even makes it seem simple after a while."

"[Dr. Marks is] the best teacher I've had in college."

"[I enjoyed the] humor! It's really easy to stay focused when something funny might happen at any time!"

"Giving examples of how the principles/techniques are used in the real world is amazingly helpful!"

"I don't know if [Dr. Marks] could be more AMAZING."

"Every section [of this class] should be taught by Bob Marks."

"Bob Marks threw in enough relevant and hilarious ancectodes as he lectured that would help hold my attention. This was great because it is easy to lose concentration when dealing with such complex mathematics. Also, his review sessions saved me. They helped a lot!"

"[Bob Marks] is great!"

"You are stimulated to really want to learn the material whenever Dr. Marks is lecturing."

"[Dr. Marks] relates the material to the real world. It helps to know how and why things work and when to use them."

"[Dr. Marks'] passion for the subject was great. [His] sense of humor was fantastic and lightened the mood of what could have been a very boring class"

"[Dr. Marks gave a] flawless performance."

"Marks is awesome."

"I think this class was great."

"[Dr. Marks] is so funny!!!"

"Awesome guy; very kind and keeps the class interesting for an otherwise boring course. Very dedicated to the students and helping them learn the material.... [He had] good side stories that contribute to understanding of material. Had lots of review sessions and was very flexible; was best part of class."

"[Dr. Marks] was great, [I] loved this class."

"Doctor Marks was very interested in the subject and has such a vast understanding of the subject that he had no trouble explaining himself in different ways. The help sessions in the evening are a great help."

"Dr. Marks is] absolutely amazing. He has a good understanding of the material so he can really break it down and explain things. He was so willing to help when we needed it no matter the amount of time or effort needed."

"[Dr. Marks was] very personable and nice. A fun teacher... Evening sessions were great."

"[Dr. Marks] cared about the students and made the classroom more of a real life atmosphere as opposed to just teaching from the book."

"email: Dr. Marks, I just wanted to tell you how much I enjoyed meeting you and having you as my teacher this semester. I really enjoyed the passion that you have for the material you were teaching and also that you would talk to students like they were equals. I really appreciated that. Your sense of humor and comedic timing made what could have been a dull class very enjoyable to come to. I also liked the little tips for life that you would sneak into a lecture as well. Thank you for an enjoyable semester. "

2008

6. Random Variables and Stochastic Processes, Fall 2008

"[Dr. Marks has] love for material, enthusiasm."

"[I enjoyed the] enthusiasm and presentations."

"I really enjoyed the not-so-structured aspect of the class."

2010

7. Introduction to Computational Intelligence, Fall 2010

   "[Dr. Marks] was enjoyable to listen to and made learnng the material a good experience."

   "[I enjoyed the] humor. Applicable stories to illustrate how this stuff is used in industry."

   "[Dr. Marks has] great enthusiasm for teaching and [the] material in [the] class. [He] acively engages students in otherr topic to stimulate discussion which allows for a more interesting lecture."

   "[I enjoyed] His enthusiasm. His knowledge of the material."

   "He was very enthusiastic with the course material. It was very easy to tell that he has great passion for his work and wants others to share it with."

2011

8. Multidimensional Signal Processing, Spring 2011

   "[Dr. Marks] is an expert!."

   "Dr. Marks's lectures are always interested."

   "He's awesome!"

   "Dr. Marks is fun to talk to and interact with. He answers questions well and obviously love what he teaches."

   "Tell me more about philosophy!"

   "He's awesome. Humor. Expert in his field of study."

   "[Dr. Marks should spend] less time critiquing liberals, atheists etc."

2012

9. Multidimensional Signal Analys

   "He explains the stuff step by step"

   "Learned, humorous, and instructive"

   "Enthusiasm and vivid language."

2013

10. Comp Intell App

    "The instructor is patient, loving, learned, and good at explaining knowledge in an interesting way. So my passion about the class was well stimulated. Also, the instructor is considerate about students' level, so the knowledge would not be quite difficult to digest."

    "The patience he had when I didn't understand a topic, to clarify and help me finally understand things."

    "Humorous"

11. Intro to Information Theory

    "You do a good job of bringing the material into terms that are easier to understand conceptually"

2014

12. Intro Comput'nl Intelligence

    "Dr. Marks is a very interesting person, but I wish more of the class time was dedicated to the material."

    "He always talk about some stories"

    "Good class learned a lot"

    "He is very funny, interesting"

    "His interest in this topic stimulate my inspiration"

    "Class lecture were very interesting with interactive simulations. The in class history of the subject also increased interest in the material."

    "Interest and knowledge of the material"

    "Able to communicate complex or abstract ideas very well. Friendly. His personality always keeps class enjoyable."

    "Thorough understanding of and great insight into the material, strong desire to make material understandable, and informal instruction approach."

13. Multidemensional DSP

"He is humor"

"Dr. Marks is a great man who not only brings great knowledge in with him, but a loving of Christ as well. He is brilliant and understands the complex theory that is prevalent throughout the entire course."

"Dr. Marks' funny and laid back attitude makes material fun that would otherwise be rather dry!"

"The course was cool and some of the lessons had interesting potential."

2015

14. Random Signals and Noise

"humor"

"Writing on the board as he explains the ideas we're learning clearly, and encouraging student participation and questions"

"Dr. Marks is a fantastic man. He is an effective professor because he is brilliant"

"Knowledge of the subject matter."

"Lecture was always very engaging and it was cool to see things come full circle on where certain formulas come from."

"I love the fact that interesting topics that come up in class are explored even when this was not a planned part of lecture!"

"Personally I like his intuitive way of explaining materials also supplied with good examples. Quiz format is good too, except I think there should be more of it."

15. Intro to Information Theory

"Dr. Marks is brilliant and good at explaining to those who are new to the subject"

"He is very interested in and zealous about this topic, and I found that contagious. He made excellent use of a great textbook. His humor livened up the class even more. Being devoted to the class, I enjoyed the concept of presenting the homework I'd done to the whole class. (Though I understand others have a phobia of presenting; I'm just getting out of that.)"

"He has a wealth of knowledge concerning the background of the material. He knows names and dates for practically every theory we discussed in the class. Using this knowledge, he adds in a lot of anecdotes about his own experience or the experience of others to make the theories seem less monotonous."

"His vast knowledge of not only the course material but the history of the material. It is very interesting to hear who and how ideas were discovered in relation to the theory as most classes just work through the math and giving a brief history of the idea puts it into perspective."

"Dr. Marks is really passionate about Information Theory. He is the best!!"

2016

16. Intro Comput'nl Intelligence

"Enjoys the material and takes the time to explain it"

"Dr. Marks is a genuinely kind instructor who has so much incredible knowledge and experience to share. I looked forward to going to this class everyday to learn more from him. He teaches class with examples that make concepts easy to process and most of them are also incredibly entertaining. He is calm, organized, and collected but shows real passion for the material."

"Dr. Marks does his best on trying to keep the class engaged by asking open-ended questions and expecting us to answer."

"His vast understanding of the material in conjunction with his passion for the subject."

"Dr. Marks is a very engaging lecturer. He uses clever analogies to convey complicated"

"Constant interaction/conversation with the audience."

"Does very well to ensure that concepts are clearly understood before moving into the math. Makes sure to keep the "big picture" in mind during lectures. Provides plenty of examples of useful applications of the topics covered."

"Explaining most things very understandably and injecting humor made class easy to follow"

"Knowledge of material, experience in implementation"

"Experience"

"His enthusiasm about the subject matter and his knowledge of it, and how it can be applied to the real world"

"He understood the material very well and used clear examples to explain the concepts in a simple and accurate way"

"Method of lecturing, interaction with students is relaxed but effective. Knowledge of material. Helped pioneer some of the methods, and is very well-informed on the rest."

"I like the the way he explain problems, always relates to something you would know and give a good example of the subject he explains."

"Dr. Marks teaches in more of a conversational tone instead of lecturing. This is helpful because it is relaxing and makes it easier to focus on the concept instead of memorizing the procedures."

17. Multidimensional Signal Analys

"His obvious passion for the subject is a great motivator in my study of the topics"

"He is very clearly passionate about the material. He keeps class light-hearted, and is always quick to have a somewhat applicable anecdote for a given topic. He has a way of presenting a very difficult concept in a way that makes it seem very approachable."

"Dr. Marks is very invested in the subjects he teaches and knows a great deal about them. He is casual with his instruction in such a way that makes the topics more enjoyable but also sets clear expectations for what will be demanded of us. He is genuine and transparent and a pleasure to learn from."

2017

18. Random Signals and Noise

"Interesting PPT slides and detailed explanation for knowledge helps us to learn more effectively"

"Relating the math to real world problems."

"Dr. Marks is full of surprises and knows so much about literally everything that it's a joy to learn from. He is passionate about the material in his classes and isn't afraid to crack a joke or make light of a homework problem failure"

"He has a very vast depth of knowledge on the subjects at hand. Its apparent he really knows the material at its core."

"I have taken every class from Dr. Marks that I could simply because he was teaching it."

19. Intro to Information Theory

"Very interesting topics"

"His engaging lecture style and his obvious passion for the subject."

"Energy"

"He teaches us how to think and solve a problem, which is more important than learning the knowledges"

"Dr. Marks was very well informed on the material and was able to explain it in a way that the book was not able to. His ability to connect with the students also contributed to a positive and insightful classroom atmosphere."

"Great Teacher! Humorous and Patient"

"His insight and experience in the subject as well as neighboring subjects"

"His engaging attitude, knowledge of the material, and ability to approach the subject from multiple angles"

9 Consulting & Other External Activities

9.1 Organizations

- ◇ Arbor Ministries, Seattle, Washington, Board of Directors, Secretary (2002-2012).
- ◇ Center for Evolutionary Informatics, Board of Directors, President (2008-present).
- ◇ American Institute for Technology and Science Education (AITSE), Advisory Council, (2009-2013).
- ◇ Intelligent Education, Advisory Board, (2015-present)

9.2 Expert Witness

- Neuromedical Systems, Inc (Plaintiff) vs. Neopath (Defendant), United States District Court, Southern District of New York (1997-98) - Decision for the Defendant.
- Neopath (Plaintiff) vs Neuromedical Systems, Inc (Defendant) vs., United States District Court, Seattle (1997-98) - for the Plaintiff.
- Nestor, (Plaintiff) vs. Hecht-Nielsen Corporation Software (Defendant), filed Nov. 25, 1998, in U.S. District Court in Rhode Island.
- Hecht-Nielsen Corporation Software (Plaintiff) vs. Transaction Systems Architects Inc. and ACI Worldwide Inc. (Defendants), U.S. District Court in San Diego.
- Ysleta Del Sur Pueblo: Tigua Gaming Agency (Defendant)vs State of Texas (Plaintiff) -for the Defendant

9.3 Consulting

- Microsoft Corporation, Redmond, WA
- Boeing Computer Services
- Boeing Airplane Company
- Applied Physics Lab, University of Washington
- APPA Systems Inc., Bellevue, WA
- Technical Arts Mfg. Co. Inc., Redmond ,WA
- John Fluke Manufacturing Company Inc., Everett, WA
- Space Labs, Redmond, WA
- Lasentec, Bellevue, WA
- Flow Industries, Kent, WA.
- Philipp Technologies, Bellevue, WA
- Multidimensional Systems Corporation, Lynnwood, WA
- Pacific Gas & Electric
- American Pioneer Corporation, Ballard
- Decisions Systems Corporation, Atlanta, GA
- Inficom Corp, Redmond, WA
- DARPA, Crystal City, VA
- Lineage Media and Solutions, Inc. Bellevue, WA

10 Interviews

10.1 Personal Interviews

2007

1. "Well-Informed: Dr. Robert Marks and the Evolutionary Informatics Lab - mp3 audio," ID the Future, July 20, 2007[Podcast]

2. Casey Luskin, "Baylor University Denies Research Scientisct Adacemic Freedon" ID the Future, September 7, 2007 - MP3 Audio. [Poscast]

2010

3. ID the Future, "Darwin as the Pinball Wizard: Talking Probability with Robert Marks", March 3, 2010.[Podcast]

2011

4. Dr. Tom Woodward, "Interview with Dr. Robert J. Marks," Darwin or Design, January 22, 2011. [Podcast], [YouTube: https://youtu.be/Yoj9xo0YsOQ].

5. Bob Marks on *Ricochet*, June 17, 2011 [YouTube video: https://youtu.be/Uc6Ktq0SEBo].

2012

6. Donald Wunsch "IEEE CIS History Commitee: Donald C. Wunsch II interviews R.J. Marks II," March 26, 2012. [Youtube: http://youtu.be/RigIZwpCWOA], [IEEE.]

2013

7. Casey Luskin "Darwin as the Pinball Wizard: Talking Probability with Robert J. Marks II," May 19, 2013. [YouTube: https://youtu.be/Kxv3Q0VaX9E].

2014

8. ID the Future "Robert Marks: Active Information in Metabiology," ID the Future, YouTube Video, May 17, 2014. [YouTube: https://youtu.be/tJSJg0IZtfI].

> "On this episode of ID the Future, listen in as Casey Luskin talks with Dr. Robert Marks about his paper, 'Active Information in Metabiology,' that was recently published in Bio-Complexity and critiques the ideas of mathematician Gregory Chaitin. Dr. Marks explains metabiology and the significance of 'active information' for intelligent design."

9. TouTube Video: "From PODCAST to 'Expelled: No Intelligence Allowed': Robert J. Marks II," June 8, 2014.

2015

10. Sarah Chaffee, "ID Inquiry: Robert Marks on Information," ID the Future, November 2, 2015. [Audio], [YouTube: https://youtu.be/c2UCPX5mKio]

2016

11. Jonathan McLatchie "The Nature of Omniscience: A Conversation with Dr. Robert Marks," Apologetics Academy Podcast, August 27, 2016. [YouTube: https://youtu.be/cW6N8NCH-dI], [Unedited: https://youtu.be/Vof0tt3cB9Q].

12. Algorithmic Specified Complexity, ID the Future Podcast (with Winston Ewert) 2016

    - Part I: Genesis
      YouTube: https://youtu.be/m3_S-nglVek
    - Part II: Application to Conway's Game of Life
      YouTube: https://youtu.be/yivqPiuqQf8
    - Part III: Measuring Meaning in Images
      YouTube: https://youtu.be/2lhiB8jTLjc.

13. "Are Minds Machines?" Science and Faith Examined, October 28, 2016. [YouTube: https://youtu.be/Cm0s7ag3SEc]

    > "This event was held at Caltech with guest conversation starter Dr. Robert Marks. Our discussion tackled questions like: What can mathematics tell us about artificial intelligence and creativity? Are there things that are unknowable? How would we know?"

2017

14. The Bob Phillips Show, The Bridge, KTXW Austin, 1120 AM, April 24, 2017. [Interview promo only: https://youtu.be/3yqFX3Snzjw], [Youtube: https://youtu.be/dmNOrtWPVzs].

15. Julian Charles "TMR 173: Dr. Robert J. Marks II" The Mind Renewed, May 20, 2017. [Audio Podcast], [Interview Manuscript], [Interview Manuscript (edited)], [Youtube: https://youtu.be/y3f-h08PGak], [Youtube plain: https://youtu.be/FAwEMS-GtKs].

16. Terry Lowry, "ARE SUPER COMPUTERS ON THE VERGE OF BECOMING OUR OVERLORDS?," The What's Up Radio Program!, July 20, 2017. [Audio Part I], [Audio Part II], [YouTube: https://youtu.be/3GwLo9CDBm], [Video Download]

17. Janet Mefford Today (American Family Radio)"A.I. Hype & Limitations with guest Robert J. Marks" June 22, 2017. [YouTube: https://youtu.be/k1N1FcsO59M].

18. "From PODCAST to 'Expelled: No Intelligence Allowed' " published June 23, 2017 YouTube: http://youtu.be/15YTKyMPaXM.

19. WPFR "Teletalk With Bob Marks: Early Talk Radio (1973)," YouTube Video, Jun 23, 2017. [YouTube: https://youtu.be/v5eFEQ6-0h4].

    "This radio talk show was recorded on November 26, 1973.

    "Before Rush Limbaugh and Glenn Beck, there was Bob Marks breaking into talk radio with Teletalk. The FCC (Federal Communications Commission) did not allow partisan political controversy when Teletalk was recorded. They do now. During Ronald Reagan's first presidential campaign, for example, if a Ronald Reagan movie were aired on television, two hours of "equal time" could be demanded by the Jimmy Carter campaign. This law, no longer in effect, allows the more polarized political radio talk shows of today."

    "Bob Marks was not only the show's host, he ran board. There was no one else in the studio to help. There is no call screener. When someone calls, they are put on the air. There are also no breaks except 5 minutes every hour for ABC news. There are no taped commercials or promos. Just talk."

20. "Point of View with Kerby Anderson. Robert J. Marks speaks on 'Are Supercomputers On The Verge Of Becoming Our Overlords?'," June 26, 2017. [YouTube: https://youtu.be/C5oPaBMS694].

21. The Remnant Road "RAGING AGAINST THE MACHINES with guest Robert J. Marks" June 26, 2017 [Podcast], [YouTube: https://youtu.be/PqJk2TlGDH4].

22. Mark Cope "The Going Home Show" (Newstalk 102.3 KXYL) with guest R.J. Marks, June 27, 2017. [YouTube: https://youtu.be/DDANCDy6S28].

23. "Vocal Point: Jerry Newcombe [Dr. James Kennedy Ministries] interviews Dr. Robert Marks about AI hype," For God & Country, June 29, 2017. [Podcast], [YouTube: https://youtu.be/TkIfmW3JR5E], [Video Download].

24. "Math, Computers, and Evolution: Robert Marks on Searches and Artificial Intelligence, Part 1, Evolution News & Science, July 10, 2017. [Podcast], [YouTube: https://youtu.be/fftvrf4zYNc].

    "On a new episode of ID the Future, CSC Director of Communications Rob Crowther talks with Robert Marks, Distinguished Professor of Electrical and Computer Engineering at Baylor University, about Markss new book, Introduction to Evolutionary Informatics, which makes an important but esoteric-sounding field accessible to the general reader.

    "Dr. Marks talks about how he and William Dembski originally connected as researchers, and began working on the subject in 2007, how intelligent design can inform thinking on artificial intelligence, and what a 'search for a search' means in evolutionary terms"

25. Doug Thorpe & Dr. Andrew Wyant " 'Dr. Robert Marks, Origins, Evolution and Information' on God Talk," July 10, 2017. [Audio], [YouTube: https://youtu.be/8uSp35pkfgQ].

26. Terry Lowry, "ARE SUPER COMPUTERS ON THE VERGE OF BECOMING OUR OVERLORDS?," The What's Up Radio Program!, July 20, 2017. [Audio Part I], [Audio Part II], [YouTube; https://youtu.be/3GwLo9CDBmc], [Video Download].

27. Robert Crowther "Why Artificial Intelligence Will Never Replace Humanity," December 18, 2017. [Podcast], [YouTube: https://youtu.be/ZStcSl1RMps],[Video Download].

    "On this episode of ID The Future, Robert Crowther talks with Dr. Robert Marks, Distinguished Professor of Electrical and Computer Engineering at Baylor University and author of Introduction to Evolutionary Informatics, about artificial intelligence and its limits. From the jump they delve into what artificial intelligence and computers will never be able to do, that is non-algorithmic tasks, and what examples of those look like such as creativity and consciousness. Marks goes over the popular tests for consciousness (Turing Test & Lovelace Test) and explains why computers still have not passed it and never will."

2018

28. Robert Crowther "The Dangers, Limits and Promise of Artificial Intelligence," ID the Future, January 8, 2018. [Podcast], [YouTube: https://youtu.be/w1Do06Uf6Ks].

    "On this episode of ID The Future, Robert Crowther explores the dangers and potential of artificial intelligence with Dr. Robert Marks, Distinguished Professor of Electrical and Computer Engineering at Baylor University and co-author of Introduction to Evolutionary Informatics. Marks uses John Searles 'Chinese Room' analogy to explain why computers do not have understanding and never will. At the same time, Marks predicts that continuing advances in technology will further augment our abilities."

29. Dont Raise the White Flag to Our AI Overlords Just Yet. [Podcast], [Link], [YouTube: https://youtu.be/Wl6k3dVOrSs].

    "On this episode of ID The Future, computer engineer Robert Marks, co-author of Introduction to Evolutionary Informatics, considers the apocalyptic danger portrayed in The Terminator movies and discussed in all seriousness by some prominent scientists and technologiststhe threat of artificial intelligence one day taking over the world. Yes, computing power doubles every couple of years or so, but Dr. Marks insists that a qualitative gulf separates humans from computers, a difference that no amount of computing power can ever overcome. Listen in to learn what it is."

181129-Medved-1.mp4

30. "The Limits of Computation," Great Minds with Michael Medved, November 29, 2018. [Web Page Link, [YouTube: Medved and Marks on Creative Computers: The Rise of Artificial Intelligence (https://youtu.be/KzwuHyyu0Gc),Video Cache.]

    > "Addressing one of todays most acclaimed technological frontiers, Michael Medved and professor of electrical and computer engineering Robert Marks discuss the limits of artificial intelligence. They begin with definitions What is a computer? What is an algorithm? before tackling some pervasive media myths. Can a computer innovate or only imitate? Can computers now really do anything different from the Turing Machine, devised as a model by Alan Turing in the 1930s? Could a computer be programmed to interact with humans like the sinister HAL 9000 in 2001: A Space Odyssey? The answer is yes, says Bob Marks, and whatever flaws such a machine displayed would be the faults inadvertently woven into it by its human programmers."

10.2 Hosted Interviews

Including hosted interviews and panel moderation & participation.

1973

1. " 'TeleTalk' With Bob Marks (November 26, 1973)," published Apr 26, 2012. https://youtu.be/bUlDF_1EW7U

2004

2. NASA/JPL Workshop on Biosynthetic Engineering for the Exploration of Space, Jan. 30-31, 2004 , California Institute of Technology, January 30, 2004 (co-Chair).

2006

3. "Challenges and Opportunities of Neural Network Research" (International Symposium on Neural Networks), ISNN2006, Chengdu, China, (May 30, 2006) - Panel Member.

4. "President's Panel", IEEE World Conference on Computational Intelligence, Vancouver, B.C. "The Genesis of the IEEE CIS: Examining the Fossil Record, " 2006

2011

5. "THE GOD DIALOGUES II: A Panel Discussion," Texas A&M University, October 27, 2011, Sponsored by Ratio Christi (Debate between Muslim, Atheist and Christian views of God.)

2011

6. "Three Predominant Interpretations of Creation (Young Earth Creationism, Old Earth Creationism, and Theistic Evolution)," Live Oak Classical School, Waco, TX, May 24, 2012 (one of three panelists)

2013

7. "Love and Cookies," Panel at Teal Residential College, February 13, 2014 (with Brian Thomas and Randall Jean)

2014

8. "Man Up," Panel at Teal Residential College, May 1, 2014 (with Ian Gravagne and Ken Van Treuren)

2016

9. "Winston Ewert interviewed by Robert J. Marks 'Algorithmic Specified Complexity Part 1: Genesis'," ID the Future, February 4, 2016. Guest: Dr. Winston Ewert. [Audio], [YouTube: https://youtu.be/m3_S-nglVek].

10. "Winston Ewert interviewed by Robert J. Marks 'Algorithmic Specified Complexity Part 2: Application to Conway's Game of Life'," ID the Future, February 10, 2016. Guest: Dr. Winston Ewert. [Audio], [YouTube: https://youtu.be/yivqPiuqQf8].

11. "Winston Ewert interviewed by Robert J. Marks 'Algorithmic Specified Complexity Part 3: Measuring Meaning in Images'," ID the Future, February 10, 2016. Guest: Dr. Winston Ewert. [Audio], [YouTube: https://youtu.be/2lhiB8jTLjc].

2017

12. "Does God Matter? Answering tough questions about Christ & Christianity" September 21, 2017. [YouTube https://youtu.be/uCkUtv1y00M] [Video Download]

13. "Does Life Matter? Answering the hard questions about abortion" November 29, 2017. [YouTube https://youtu.be/gZqBcWLUzqg] [Video Download]

2018

14. "Will the Machines Take Over? Human Uniqueness in the Age of Smart Machines" Broadcast from the William Allen Theater at Seattles Museum of Flight in Seattle, WA [YouTube Link: https://youtu.be/GJ7WJitJ5E0.] WILL THE MACHINES TAKE OVER? Mind Matters, June 1, 2018. [Link.]

15. "Why 'Mind Matters' Matter," Mind Matters Today, July 12, 2018 [Link, Audio Only, Cache.]

    > "Host Robert J. Marks introduces the breadth of issues that will be covered on the Mind Matters podcast, from job displacement to human flourishing in a world increasingly run by our algorithms. In brief, Mind Matters will bring natural and artificial intelligence head to head in the areas of research, application and education."

16. "TRUSTING THE BLOCKCHAIN: Will Fullerton on Blockchain as a Foundational Technology," Mind Matters, July 30,2018 [Link, Audio Only, Cache.]

    > "Robert J. Marks and Will Fullerton discuss what changes await as we enter the implementation phase of a foundational technology: blockchain. While China is making a multi-billion dollar investment, IBM is betting on countless blockchain projects. And by promising to disintermediate financial institutions, blockchain holds the promise of radically reducing obstacles and overhead from human transactions. Still, challenges remain to be solved that are inherent to the technology. Join Bob and Will for a stimulating conversation."

17. "BITCOIN AND THE KEYS TO CRYPTOCURRENCY SECURITY," Mind Matters, August 8,2018. Guest: Will Fullerton. [Link, Audio Only, Cache.]

    > "Everyone has heard the buzz about Bitcoin, but what is driving this mad dash and the volatile cryptocurrency markets? What are the mechanics of Bitcoin, of mining and trading it? How are transactions secured against tampering? Is it anonymous, and thereby shielded from the IRS? As Warren Buffet would have it, is it time to be fearful or greedy?"

18. "NON-ALGORITHMIC MIND: The distinctiveness of human creativity and consciousness," Mind Matters, August 23, 2018. Guest: Dr. Eric Holloway. [Link, Audio Only.]

    > "What is an algorithm and could a computer ever perform a non-algorithmic task? Computers are getting faster, algorithms are getting more complex, and our computing power is growing. With all these advancements, are there limitations that computers can never overcome?"

19. "WHAT HUMANS DO THAT A.I. CANT," Mind Matters, September 2, 2018. Guest: Dr. Eric Holloway. [Web Page Cache, Audio Only Link, Audio Cache.]

    > "AI can do many things faster and better than humans. It can beat humans in chess, outsmart us in Jeopardy, and defeat us at GO. The question remains. Is there anything a human can (and always will) do better than an AI?"

20. "WHAT IS BUSINESS INTELLIGENCE? Discussing how Artificial Intelligence Has Changed the Opera with Jeremiah Marks," September 20, 2018, Mind Matters, Guest: Jeremiah Marks, CPA, MBA. [Web Page Cache, Audio Cache.]

> "Business intelligence affects you daily; from advertising and solicitation to how much you pay for tickets to watch the Dallas Cowboys. Jeremiah Marks talks about what business intelligence is and how it changes the way we approach our customers."

21. "DOES TECHNOLOGY FAVOR TYRANNY? Deconstructing Yuval Hararis Silly Forecast of AIs Future Impact," Mind Matters, October 5, 2018.Guest: Dr. Jay Richards. [Web Page Cache, Audio Cache.]

    > "Will infotech and biotech erode human agency, subvert human desires, and render free-market economics obsolete? At first glance, there looks to be a wide gap between the future of AI and the destruction of democracy. Some futurists claim to have jumped that chasm. In a cheery little column published by the Atlantic, Yuval Noah Harari posits AI will ultimately destroy democracy and favor Digital Dictatorships. What is his argument and does it hold water?"

22. "Winston Ewert Unpacks his New ID Model, the Dependency GraphPt. 1," ID the Future, October 10, 2018. Guest: Dr. Winston Ewert. [Web Page Cache, Audio Cache.]

    > "On this episode of ID the Future, guest host Robert J. Marks talks with Dr. Winston Ewert about Ewerts groundbreaking new hypothesis challenging Darwins common descent tree of life. The new model is based on the well-established technique of repurposing software code in different software projects. Ewert, a senior researcher at Biologic and the Evolutionary Informatics Lab, describes the nested hierarchical pattern of life and how any credible theory of lifes origin and diversity must explain it. He then describes how Darwin's basic theory fits, and doesn't fit, the pattern, and the various ancillary mechanisms invoked to close the gaps. These patches include horizontal gene transfer, convergent evolution, and incomplete lineage sorting. Ewert then cues up what he argues is a better, more elegant hypothesis, the common design hypothesis laid out in his peer-reviewed technical paper available here."

23. AI and Ethics; Industry Panel with George Montanez, Sujatha Kashyap, & Sujatha Perepa, moderated by Robert J. Marks II, Paul L. Foster Campus for Business and Innovation, McClinton Auditorium, Foster 240. [Web Page Cache.]

24. "Dependency Graph, Pt. 2: Winston Ewert Defends His Groundbreaking New ID Model." ID the Future, October 15, 2018. Guest: Winston Ewert. [Web Page Cache, Audio Cache.]

11 In The News

11.1 Awards Articles

1968

1. The Mirror "Over 200 Enter Projects in Science Fair." Winning Garfield Heights High School Science Fair (1968).

   > "Posing for the MIRROR are [seven] winners of the Superior rating. Back row... Robert Marks..."

2. Ohio Academy of Science, Junior Membership, March 13, 1968 [Certificate]

3. State Superior Award, April 6, 1968 [Certificate]

1982

4. "Noteworthy Counselors. Here are 1982's Top Ten Outstanding and Advisors," IEEE Potentials, Fall 1982, pp.44-45

   > "He has been sensitive to providing opportunities for the students to develop their talents for leadership and facing the realities of extracurricular, professionally oriented teamwork. This includes the notion of professional responsibilities.
   > James S. Meditch, Chairman' Dept of Electrical "

1988

5. "Marks Is first honorary member of Puget Sound Optical Society" Data (University of Washington), November 1988

   > "Robert J. Marks, Professor, EE, has been awarded the first Honorary Membership in the Puget Sound Section of the Optical Society of America for 'his efforts in founding the Puget Sound Section and his excellent performance as the section's first president"'

1989

6. OSA Fellows, Optics News September 1989

   > "For contributions to image recovery and synthesis, optical processing, and electro-optical neural networks"

1992

7. Bryon Taylor, "Alumnus takes his research beyond the ivory towers," Rose-Hulman Echoes, Vol.1991-1992, Summer, 1992, p.16.

   "Robert J. Marks 11 thrives in higher education, but don't go building him any ivory towers. He is not one to limit his activities to his lab.

   "The 1972 electrical engineering graduate is a teacher, researcher, editor, businessman, song writer and cartoonist. In his spare time, he was able to return to campus this spring to receive a Distinguished Young Alumnus award."

   Marks is co-founder of the Christian Faculty Fellowship at the University of Washington and he serves as faculty adviser to the college's Campus Crusade for Christ."

8. "Dr. Marks receives Award," Garfield Hts. Leader, May 14, 1992.

   "Jack and Lenore Marks attended their son's award presentation by his alma mater, Rose Hulman Institute of Technology in Terre Haute, Indiana...

   "Dr. Marks was presented a Distinguished Alumni Plaque for having distinguished himself among his peers, for having used his education for the betterment o mankind and for bringing credit to his alma mater."

9. Rose-Hulman Honors and Awards, May 2, 1992 - Distinguished Young Alumni Award.

   "A professor of electrical engineering at the University of Washington, Marks has been recognized for his work by IEEE. In 1984, he was honored with the IEEE Centennial Medal and Certificate. He was an IEEE Distinguished Lecturer in 1991-92. He also is a fellow of the Optical Society of America. Marks has published over 100 journal and proceeding papers in the areas of signal analysis, detection theory, signal recovery, optical computing, signal processing, fuzzy systems and artificial neural processing. He has two patents in the field of neural networks."

10. "Dr. Robert Marks receives Distinguished Alumni Award" The Glenville Democrat, May 14, 1992, Volume 88. Number 20, p.7.

    "Dr. Robert J. Marks II, son of Jack and Lenore Marks of Garfield Heights, Ohio., formerly of Sand Fork, has been presented a Distinguished Alumni Award in ceremonies held at Rose Hulman Institute of Technology in Terre Haute.

    "Mr. and Mrs. Marks and Dr.Marks' uncle and aunt, Junior and Justine McHenry, also formerly of Sand Fork, attended the presentation ceremonies in Terre Haute.

    "He has lectured or taught short courses throughout the United States and in Europe, Asia and Mexico. This year he is scheduled to lecture in a number

of cities both in and outside the United States including Beijing, Moscow and Madrid.

"In 1984 he was honored with the Institute of Electrical and Electronics Engineering Centennial Medal and Certificate. He was an I.E.E.E. Distinguished Lecturer for 1991- 1992 and is Editor-in-chief of I.E.E.E. Transactions on Neural Networks. He has two patents in the field of neural networks."

1993

11. IEEE Fellow, IEEE Neural Networks Council: "1993 Fellows" , CoNNections: The Newsletter of the IEEE Neural Networks Council, Vol.4, No 1, March/April 1994, pp.4-5

    "For leadership in, and contributions to, the field of neural networks"

12. IEEE Fellow, IEEE Power Engineering Society: IEEE Power Engineering Review, v.14, #2, 1994, Cover

13. "IEEE Fellows," Proceedings of the IEEE World Congress on Computational Intelligence, (1994)

14. "IEEE CAS Fellow Profiles 1994", IEEE Circuits and Systems Society (CAS)

2003

15. Marks receives NASA Tech Brief Award, Oct. 13, 2003

    "Tech Briefs, a NASA magazine reporting innovative engineering design and manufacturing solutions, has recognized Dr. Robert J. Marks, Distinguished Professor of Electrical Engineering at Baylor University, with an award for innovations reported in a paper, 'Minimum Power Broadcast Trees for Wireless Networks.'

    "The NASA Tech Briefs Award recognizes new technology that relates to current or future NASA's aeronautical and space activities. Marks, along with his co-innovators, was cited for developing new technology that contributes to the mission of the Jet Propulsion Laboratory and the National Space Program."

2007

16. Anika Smith, "Banned Item of the Year," ID the Future. October 15, 2007 ... [Podcast]

    "On this episode of ID the Future, Casey Luskin celebrates Banned Books Week by nominating Dr. Marks's Evolutionary Informatics Lab as the Banned Item of the Year."

17. Casey Luskin,"Banned Item of the Year: Dr. Robert Marks' Evolutionary Informatics Website," Evolution News & Views, 071003

> "Last year John West nominated Of Pandas and People as Banned Book of the Year after the ACLU tried to have it banned from Dover Science Classrooms. We are again celebrating Banned Books Week, and it is fitting to note that Baylor University is also observing Banned Book Week.
>
> "Baylor's Banned Books Week events page states, 'What do authors Harper Lee, F. Scott Fitzgerald, John Steinbeck and J.K. Rowling have in common? They have all written books that were challenged and banned by libraries in the United States.' Although his work in question here is not a book, Dr. Robert Marks also has something in common with those authors: someone has banned his ideas. As we have recounted extensively here on Evolution News & Views, a Baylor University administrator originally ordered Dr. Marks to 'disconnect this web site immediately' because he had 'received several concerned messages this week about an [ID the Future Podcast] interview and web site dealing with evolutionary computing associated ID.' Dr. Marks' website discussing his research that challenges Darwinian evolution was then banned from Baylor webspace without his knowledge or permission, and Baylor has yet to restore the website to its server. Thus, I would like to nominate Robert Marks' Evolutionary Informatics Website as the banned item of the year for 2007. Banned Books week is supposed to be a celebration of tolerance and diversity, so in that spirit it seems fitting to discuss some of the research papers that Dr. Marks formerly had posted on his Baylor Evolutionary Informatics Lab website:
>
> "William A. Dembski and Robert J. Marks II, 'Conservation of Information in Search: Measuring the Cost of Success' "
>
> "William A. Dembski and Robert J. Marks II, 'Active Information in Evolutionary Search' "

2008

18. Baylor Engineering Professor Receives Volunteer of the Year Award, May 28, 2008

> "Dr. Robert Marks, Distinguished Professor of Electrical and Computer Engineering at Baylor University, has received the Volunteer of the Year award from the Dallas Chapter of the Institute of Electrical and Electronic Engineers, the largest professional society in the world. The award was given to Marks by the chair of the Dallas Section of the IEEE at an awards banquet earlier this month.
>
> "Marks received the award in part for his work establishing the Computational Intelligence Society of the Dallas Chapter of the IEEE, and served as the first chair of the society."

11.2 Adaptation of Cone Kernel GTFR

Y. Zhao, L.E. Atlas and R.J. Marks II, "The use of cone-shaped kernels for generalized time-frequency representations of nonstationary signals", IEEE Transactions on Acoustics, Speech and Signal Processing, vol. 38, pp.1084-1091 (1990).

1. Use in MATLAB toolbox manual
2. National Instruments Software
3. LabVIEW Software

11.3 Articles, Audio & Video in the News

11.3.1 1980-1989

1981

1. William W. Stone,"Transformations in Optical Signal Processing," Applied Optics, vol. 20, No. 15, pp. A143-A144 (1981)

1987

2. Brenna Chow, "Faculty Profile: Professor Robert J. Marks II," EE News (University of Washington) Vol II, No. 4, December 1987, pp.1-2

   > "After leaving his office, I had in my bag a complimentary copy of 'Addended Chortles,' a cartoon booklet, and a cassette tape entitled 'Theatre of the Ears: Much Ado About Shakespeare,' a radio play whose plot revolves around a physicist resurrecting 'The Bard' (William Shakespeare). Side B of the cassette contained thirty minutes of original songs written and produced by the same man in his home recording studio. This gentleman also worked his way through college as a disc jockey and talk show host on a 50,000 watt FM radio station. Wait! This doesn't sound like the profile of a logical and reserved EE professor!
   >
   > "On the contrary, cartooning, songwriting, and audio play writing are just some of the hobbies of Professor Robert J. Marks IT, a member of the Electrical Engineering department's faculty since 1977. However, while his hobbies may seem a bit whimsical, his research is pursued with a steady earnestness."

3. "Marks heads local Optical Society chapter; chairs IEEE committee" Data (University of Washington), November 1987
4. Sharon Kasper, "Artificial neural networks model the human brain," The Trend in Engineering, 1987 pp.4,9

> "Robert J. Marks II, professor and Les Atlas, assistant professor, both of electrical engineering are combining their skills in optical computers and speech recognition to help uncover the secrets of neural networks."
>
> "Improved memory with in the actual computer architecture is another advantage of the APNN. The associative memory capability of the artificial neural network could allow the APNN to identify a black and white picture (similar to a digitized pictur e) of the Mona Lisa given only her smile. 'We have a matrix of neurons,' explains Marks. 'that can take on a gray levels. In this matrix every neuron is connected to every other neuron, and each neuron can assume a val ue that relates to a gray level. So, having been given a picture of the Mona Lisa, the gray levels of that picture are imposed on the neurons and the information is stored in the interconnects...and remarkably, if the network is then given only the Mona Lisa's smile, the APNN could then extrapolate the entire face of the Mona Lisa.' "

5. "The Optical Society Of America now has an official Puget Sound Chapter, thanks to the efforts of Robert J. Marks II," The Trend in Engineering, May 1987 p.6

1988

6. R. Colin Johnson, "Optics And Neural Nets: Marriage Of Convenience," Electronic Engineering Times, January 18, 1988

> "One paper... described a neural network architecture for optical technology that took but a single presentation foe any particular set of data to be learned.
>
> "It also was claimed to be very fast sinc e its passive optical feedback used only guided or free space propagation."
>
> "The University of Washington professor Robert J. Marks II gave the presentation ..."

7. Sharon Kasper, "Artificial neural networks model the human brain," The Trend in Engineering, Vol. 39, No. 1, Spring 1988, pp.1-2

> "Robert J. Marks 11, professor, and Les Atlas, assistant professor, both of electrical engineering, are combining their skills in optical computers and speech recognition to help uncover the secrets of neural networks."
>
> "Developing a computer that can deal with such complexity requires an understanding of the human (biological) brain and the way in which its billions and billions of neurons interact."

1989

8. "Council on Neural Networks formed," EE News (University of Washington), Vol. 4, #2 (December 1989) p2.

"At their November Meeting, the Technical Activities Board of the IEEE, consisting ofthe presidents of the 37 societies and councils ofthe IEEE, approved formation of the IEEE Council on Neural Networks (CNN). The CNN will be the focus of all neural network activity in the IEEE, including the publishing of the new journal IEEE Transactions on Neural Networks and coordination ofthe largest conference in the world on the topic, the International Joint Conference on Neural Networks.

"At the first meeting of the Administrative Committee of the CNN, UW EE professor Robert J. Marks II was elected the first president of the CNN."

11.3.2 1990-1999

1990

9. Herb Rauch, "The Inauguration of a New Publication," IEEE Transactions on Neural Networks, Vol. 1, No. 1 (1990), p.1

"The creation of a new publication is an immense undertaking, and we thank the many people who have made it possible. In particular. Bob Marks. President of the IEEE Neural Networks Council, has provided valuable leadership and steady support."

1991

10. "Scientists create thinking computers to forecast loads" Puget Power & Light Co. Newsletter (1991)

"A think tank consisting of university professors and technical experts from inside and outside of PG&E laid the foundations for developing a "smart" electrical distribution system that will be a key piece of the utility of the future."

"To create the vision and begin prioritizing some of the needed early research, experts from within PG&E and outside the company were brought in. 'We brought in a group of experts from around the U.S.,' explained Steve Krein. 'The list includes Dr. Lotfi Zadeh, a professor at U.C. Berkeley who's been called 'the father of fuzzy logic,' Dr. Robert Marks, the president of the EEE neural networks society, Dr. Roger Howe, who is co-director of the sensors lab at U.C. Berkeley, Dr. John Grainger, the director of the Electric Power Research Center at North Carolina State, and others."

11. "INNS, IEEE to End Meet Agreement," Intelligence, The Future of Computing, Vol.7, No. 10, February 1991

"Werbos received word that the IEEE's (Institute of Hectrical and Electronic Engineers) neural network council administrative committee had moved by

vote to end the joint meeting agreement with INNS after meetings to be held in 1993."

"Robert Marks of the U of WA/Seattle, who's patent #849,940 appeared in the January, 1990 issue of INTELLIGENCE, spoke of the vote on behalf of the IEEE neural net council. He noted that the council may eventually become a full society within the IEEE structure. He said that the vote to dissolve the agreement because the focus of interest of the neural net council was expanding.

"Asked whether the vote was final, Marks said: 'Yes. It is final. You could see that now we [the two organizations] are divorced. But that doesn't mean that we might not live together again in the future. And, if you consider the conferences to be like our children, there might be more in the future. Further negotiations will determine the future nature of the IEEE/INNS relationship.' "

12. Hill Williams "Power Matchup," Seattle Times, June 17, 1991

"It was man against machine... [T]he computer, programmed in eerie similarity to a human brain, had performed impressively."

"The computer made its own predictions during the test period, from November through March. It was one of the Pacific Northwest's first trials of what's known as a neural network in which a computer can train itself by learning from its own mistakes."

" 'It's an exciting technology, the ability (of the network) to gain wisdom from experience,' said Robert Marks, a professor in the UW's department of electrical engineering. The department is one of the nation's leaders in development of neural networks. Neural networks are an attempt to imitate the human brain, described by one expert as 'the most complicated and sophisticated thing on the planet.' "

" 'A problem with neural networks is that they take a long time to train," Marks said. "You have to show them what to learn thousands and thousands of times.' "

13. John Swensen, "Computer Learning Shapes Up," Journal American, June 21, 1991.

"Researchers at Boeing Computer Services say an emerging technology called neural networks may help them save asubstantial amount of money on each new commerciai aircraft part made by Boeing engineers."

"Neural networks are similar to artifical intelligence, but with a key difference. Robert Marks, professor of electrical engineering at the University of Washington and president of a neural-network engineering group, explained the difference between the two technologies with this example: To teach a neural network to distinguish between a bush and a tree, one would show it a bush and a tree and another bush and another tree and so on until it learned the difference. To teach a so-called 'expert system' using artifical

intelligence, one would feed it a set of rules describing a bush and a tree, such as, 'A bush is a small squatty thing which ... ' and so on."

14. Ming Koh, "Everyone likes it hot! Pizza Unites EE's at IEEE Pizza Feed," EE News (University of Washington), Vol. 5, #4 (March 1991) p1

    "Professor Bob Marks of the EE department did a fine job of running the evening's program and introducing the various speakers. He once took the opportunity himself to briefly describe the activities of the IEEE and the benefits of being a member."

15. "The Specialties," IEEE Spectrum, January 1991, p.79

    "Artificial neural networks remain the most exciting topic in the field of computational sciences, maintained Robert J. Marks II, president of the IEEE Council on Neural Networks. Meanwhile, however, they 'are still seeking an application identity,' he said. 'Currently, the bulk of interest is being focused on artificial neural networks as classification and regression machines trained by example. Such networks have been proposed and preliminarily applied in fields as diverse as electric power load forecasting, medical diagnosis, mortgage brokering, explosives detection, speech recognition, remote sensing, and racehorse handicapping.' The short-term success of the networks will be determined by their performance relative to other cutting-edge techniques and to more conventional approaches, he said, adding that in recent studies 'in most cases, the artificial neural network has performed quite well.'

    "But although the 'modular and parallel structure and, in some cases, the highly fault-tolerant characteristics of artificial neural network architectures remain quite attractive,' Marks cited some problems. 'The most widely used artificial neural networks, for example, don't scale well. They typically yield a diminishing performance return as the size of the net grows,' he observed. 'Possible solutions include modularization or a more general algorithmic breakthrough.' As for their current use as classification and regression machines, he pointed up significant training problems. 'Current popular training procedures, for example, remain painfully slow and many require floating-point precision, prohibiting analog implementation,' he said."

16. Decisions Systems International (DSI) Newsletter, Artificial Neural Networks Short Course Announcement, Monaco, (February 1991)

    "Dr.Marks is a foremost international authority I on Anificial Neural Networks. He is currently professor in the Department of Electrical Engineering at the University of Washington. He was the Chair of IEEE Neural Networks Committee and was the co-founder and first chair of IEEE Circuits and Systems Society Technical Committee on Neural Systems & Applications. Professor Marks was also elected the first President of the IEEE Council on Neural Networks."

17. Optical Systems Lab, Texas Tech University (1991) (flyer)

    "'I found the research to be on the cutting edge, and I thoroughly enjoyed my interactions with the OSL faculty, I wish people everywhere were like the people of Lubbock' Bob Marks, Ph.D."

1992

18. "The Specialties," IEEE Spectrum, January 1992, p.63

    "Robert J. Marks II, president of the IEEE Council on Neural Networks, calls the networks an extraordinary engineering tool, which is here to stay. They are already currently viable in a number of applications and useful, dedicated hardware is available. A promising area, he said, is the coupling of neural networks to fuzzy systems. 'Layered perceptrons [feedforward artificial neural networks] can be taught fuzzy membership functions from raw data. Rules are thereby empirically learned.'

    "A related discipline, Marks pointed out, is the genetic algorithm and associated evolutionary programming. The terminology, he said, 'relates only loosely to the biological counterpart, not unlike reference to 'rabbit ears' or an 'electronic eye.' Genetic algorithms perform a highly parallel search of use in, say, the design and optimization of neural network architectures.' But, Marks emphasized, as a technology, genetic algorithms and fuzzy nets are where neural networks were about a decade ago."

19. Russell C. Eberhart, "President's Message", CoNNections: The Newsletter of the IEEE Neural Networks Council, Vol.2, No.4, December 1992, p.3.

    "I also believe that I share the award with many people in the NNC who 'kept the faith' and worked hard to make the conference a reality, such as Prof. Robert Marks, who has consistently helped with international activities,"

20. Wesley E. Snyder, "From Russia ... With Hope", CoNNections: The Newsletter of the IEEE Neural Networks Council, Vol.2, No.4, 1992, p.4

    "Congratulations and thanks are due to many people: Witali Dunin-Barkowski, the general chair, and his colleagues in Russia; Bob Marks, former NNC president and current editor of the Transactions on Neitral Nerworks; who was international chair; Dmitry Kaplan of the University of Washington who handled the (very complicated) finances of the conference, and doubled as translator and guide for Bob and me;"

21. J.C. Bezdek, "Guest Editorial," IEEE Transactions on Neural Networks, Vol. 3, No. 5, September 1992, p.641.

    "Thus, it seems appropriate at this point to fitst thank the NNC (in particular, Russ Eberhart, Bob Marks, Pat Simpson, and Mike Roth) for their interest, enthusiasm, and support."

22. Kathleen Dugan, "PUNK SIGNAL PROCESSING?" EE News (University of Washington), Vol. 6, #3 (Feb 1992) p5.

    "Other researchers and theorists have brought a significant amount of insight into the theories, including Professor Marks(two dimensional transform theory)"

23. Russell C. Eberhart, "President's Letter", CoNNections: The Newsletter of the IEEE Neural Networks Council, Vol.2, No.1, February 1992, p.3

    "As I take over the Presidency of the IEEE Neural Networks Council, I reflect over the past two years under the leadership of Bob Marks. His guidance was creative, yet even-handed. He always considered all the sides of a question, but wasn't afraid to make hard decisions when they were needed. He paid attention to every administrative detail, but never lost sight of the big picture. And he insisted on the highest standards of integrity and service to the members. I hope I can do as well."

24. Colin Wiel, "Don't Miss the First FLANNIG Invitational Roundtable," Fuzzy Logic and Neural Network Interest Group (FLANNIG), Vol. 1, No. 2 , September 1993, p.1

    "On Thursday, Oct. 14th, FLANNIG will host a roundtable discussion titled 'Applying Fuzzy Logic' featuring a panel of fuzzy login practitioners from companies within Washington. Dr. Bob Marks, professor of Electrical Engineering at the University of Washington, will moderate the discussion."

25. "Market to Market," Pacific Economic Review Magazine, Summer 1993, p.4 (About the business *Financial Neural Networks*

    "Finacial Neural Networks (FNN) Inc. of Kirkland Washington is co-sponsoritn a project with the Wasshington Technology Center (WTC) to improve its current artificial neural network-based software package used to predict performance of the Standard & Poor 500."

26. Wesley E. Snyder, "From the Editor", CoNNections: The Newsletter of the IEEE Neural Networks Council, Vol.2, No.1, February 1992, p.16

    "On behalf of the Council I'd like to offer thanks to Mike Roth, who is stepping down as editor of the IEEE Transactions on Neural Networks. Rather than taking a well deserved rest after servlng as NNC 1991 President, Bob Marks, is succeeding Mike as the third editor of the Transactions."

1993

27. Wendy Bannister, "Roundtable Brings Fuzzy Logic Into Focus" Fuzzy Logic and Neural Network Interest Group (FLANNIG), Vol. 1, No. 3 , December 1993 , pp. 1-2.

"We recently conducted a round table discussion of applying fuzzy logic to real life problems Dr. Bob Marks of the University of Washington lead the questioning of the five member panel. The experience of our panel members ranged from creating software to explore fuzzy logic to making hardware en bedded fuzzy systems, and from control systehs of large manufacturing kilns to the braking of airplanes. The panel members, with the direction of Dr. Marks, offered commentary on the stability of systems, eased training, problems encountered, and the possible future of fuzzy systems."

28. Russell C. Eberhart, "President's Message", CoNNections: The Newsletter of the IEEE Neural Networks Council, Vol.3, No 2, July 1993, pp.1-2.

"The Council's next conference is the Virtual Reality Annual International Symposium (VRAIS), being held in Seattle, Washington, in September. Tom Furness, Tom Caudell, Bob Marks and the rest of the organizing committees have been working hard to make this, the first IEEE-sponsored conference focused on virtual reality, an event you won't want to miss if you are working on or interested in the field."

11.3.3 2000-2009

2006

29. "Engineering research seeks to replicate natural behaviors," Baylor Research Tracks, June 6, 2006.

"Dr. Robert Marks, Distinguished Professor of Electrical and Computer Engineering, recently received a grant from the Office of Naval Research to support his work on the behavior of swarms.

"Swarm behavior is commonly observed in the natural world, where insects like ants, bees and termites are able to build intricate structures without any central control or supervision. While it might seem that the tiny creatures are exhibiting highly intelligent behavior, Dr. Marks says the behavior is actually driven by simple rules governing the action of individual insects. Taken together, these rules result in emergent, and often unexpected behaviors. To illustrate the way simple rules can influence swarm behavior, Dr. Marks asks students in his classes to look around the room and randomly choose two other students, then challenges the class to predict what will happen when everyone stands up and takes slow steps to position themselves between the two others. The answer, that students end up clustered in the center of the room, isnt readily apparent.

"While this example shows the challenge of predicting behaviors based on rules, Dr. Marks says the inverse problem beginning with a desired swarm behavior and crafting rules that will produce it is even more difficult.

> " 'We use computer simulations to devise swarms and set them in motion,' he said, 'then see which rules get closest to the behavior we want. Then we can repopulate the swarms that work best and make slight modifications so the fitness of the behavior gets better and better.'
>
> "Swarm behavior has implications in a variety of areas, from logistics to communication to military applications. In his current project, Dr. Marks will work with graduate student Jon Roach and Dr. Benjamin Thompson, a Baylor alumnus (B.S. '00) currently working as a research associate and heading a department in the Applied Research Lab at Penn State University. They'll seek to design swarms that mimic another behavior found in nature agents' changing roles in response to outside stimuli.
>
> " 'If an ant colony is attacked, worker ants become soldier ants,' he said. 'When a bee finds flowers, it returns to the hive and does a dance to recruit other bees to accompany it back to harvest the flowers. We are looking at ways to use this property in the design of swarms.' "

2007

30. William Dembski "Robert Marks's Evolutionary Informatics Lab," Uncommon Descent, 2 June 2007

> "Robert J. Marks II... has just put his new Evolutionary Informatics Lab online [EvoInfo.org]"

31. email from Dean Ben Kelley

> ""Bob:
>
> "I have received several concerned messages this week about an interview and web site dealing with evolutionary computing associated ID. Please disconnect this web site immediately and Cheryl will arrange a time for us to meet immediately upon my return. I am teaching in the I5 program in Shanghai this week.
>
> "Thanks,
> Ben Kelley"

32. William Dembski, "Paper and Website: 'The Jesus Tomb Math' ", Uncommon Descent, July 12, 2007

> "As I announced a few weeks ago on this blog, Robert Marks and I have been collaborating on some papers on the mathematical foundations of ID at the Evolutionary Informatics Lab (these papers are currently under review with mainstream peer-reviewed journals)"
>
> "We have also just finished a paper debunking the statistics of James Cameron et al. (go to www.jesusfamilytomb.org), who have claimed both in a documentary on the Discovery Channel and in a book titled The Jesus Family

Tomb that the pattern of names in a tomb found outside Jerusalem matches names in Jesus' family so closely that it is highly probable that this is in fact the family tomb of the New Testament Jesus. Since 'Jesus son of Joseph' is buried there, this would indicate that Jesus himself is buried there. The implication that the Resurrection is a hoax is immediate.

"Prof. Marks and I show that the statistics cited by the Jesus Family Tomb people are bogus. See our paper."

33. Casey Luskin, "Well-Informed: Dr. Robert Marks and the Evolutionary Informatics Lab," ID the Future, July 20, 2007

    "In today's episode of ID The Future, Casey Luskin interviews Dr. Robert Marks about his work in evolutionary informatics at Baylor University. Marks explains that evolutionary informatics seeks to emulate evolution on a computer, allowing for new engineering designs to be developed. Unlike Darwinian evolution, this process does not advance gradually, and requires a certain amount of external information to be fed into the computer before the process can begin; in other words, the systems must be designed before the evolution can begin. This contrast fueled Marks' interest in intelligent design, and has led him to critically analyze a number of evolutionary computer programs that claim to prove Darwin's theories"

34. William Dembski "Casey Luskin interviews Robert Marks concerning his new Evolutionary Informatics Lab," Uncommon Descent, 20 July 2007

    "Here's a fun interview with my friend and colleague Robert Marks. I hope you catch from the interview the ambitiousness of the lab and how it promises to put people like Christoph Adami and Rob Pennock out of business"

35. Ben Stein, "Expelled: No Intelligence Allowed Blog," Expelled

    "When a 'Baptist' University pulls the plug on Evolutionary Informatics Lab because of its links to intelligent design proves the antagonism to ID. The Baylor University administration shut down Prof. Robert Marks's Evolutionary Informatics Lab because the lab's research was perceived as linked to intelligent design (ID).

    "Robert J. Marks II, Distinguished Professor of Electrical and Computer Engineering at Baylor, had hoped that a late-August compromise would save his lab, but the University withdrew from the previous offer. While President Lilley was not at the meeting, an insider senses his hand in the affair, noting that Lilley was the only person with the authority to overturn what the Provost, who was at the meeting, agreed to."

36. Casey Luskin, "William Dembski Addresses Forthcoming Intelligent Design Research that Advances ID and Answers Critics," Evolution News & Views, July 22, 2007

"Our recent podcast interview with Robert Marks, Distinguished Professor of Electrical and Computer Engineering at Baylor University, discusses his new Evolutionary Informatics lab at Baylor University."

"With the formation of Baylor's Evolutionary Informatics Lab just this month and work by me and my colleague Robert Marks on the conservation of information (several papers of which are available at www.evolutionaryinformatics.org), I think ID is finally in a position to challenge certain fundamental assumptions in the natural sciences about the nature and origin of information. This, I believe, will have a large impact on science."

37. *Expelled: No Intelligence Allowed* Blog, August 21, 2007

"A distinguished science professor at a major American university has weighed in on Iowa State University's denial of tenure to pro-ID astronomer Guillermo Gonzalez, expressing astonishment at the result. According to Dr. Robert J. Marks, Distinguished Professor of Electrical and Computer Engineering at Baylor University:

" 'I went to the Web of Science citation index which is the authority on citations. Only journal papers, not conference papers, are indexed. There are lots of Prof. Gonzalez's papers listed. My jaw dropped when I saw one of his papers has 153 citations and 139 on another. I have sat on oodles of tenure committees at both a large private university and a state research university, chaired the university tenure committee, and have seen more tenure cases than the Pope has Cardinals. This is a LOT of citations for an assistant professor up for tenure. The number of citations varies with discipline and autocitations are included in the tally, but this is a LOT of citations for an Assistant Professor. A lot.' "

38. Sam Hodges "Baylor easing up on Intelligent Design advocates,"Dallas News Religion, August 23, 2007

39. Lynn Vincent "Baylor plays fair on ID-supporting research," World Views, August 23, 2007

"Four years ago, distinguished professor of engineering Robert J. Marks left his longtime position at a secular school to help Baylor University achieve its aim: To become a top-tier research institution without compromising its distinctly Christian worldview. But when Marks recently created a lab dedicated to evolutionary informatics then published his findings on a university website, some Baylorites didn't like it."

40. "Baylor plays fair on ID-supporting research," World Views Daily News, August 23, 2007

"Four years ago, distinguished professor of engineering Robert J. Marks left his longtime position at a secular school to help Baylor University achieve its aim: To become a top-tier research institution without compromising its

distinctly Christian worldview. But when Marks recently created a lab dedicated to evolutionary informatics then published his findings on a university website, some Baylorites didn't like it.

"Some members of the Baylor community took issue with Marks' conclusions, which place limits on the scope of Darwinism and offer scientific support for the theory of intelligent design. These ID opponents, who remain unidentified, complained to Dean Ben Kelley of the School of Engineering and Computer Science, who promptly pulled the plug on Marks' lab and took down the accompanying website.

"But Marks' story, so far, has a better ending than that of mathematician William Dembski, whose Michael Polyani Center at Baylor also studied Intelligent Design."

41. Mark Bergin, "Crisis averted," World Magazine, August 25, 2007

"Robert J. Marks fully endorses the vision of Baylor University. The distinguished professor of engineering left his longtime position at a secular school four years ago to help Baylor realize its ambitious aimnamely, to achieve the status of a top-tier research institution without compromising its distinctly Christian worldview.

"To that end, Marks recently created a lab dedicated to evolutionary informatics, the study of whether Darwinian processes like random mutation and natural selection can generate new information. He published his findings on a university-hosted website, believing the research to be both top tier and consistent with Baylor's Baptist heritage.

"But some members of the Baylor community took issue with Marks' conclusions, which place limits on the scope of Darwinism and offer scientific support for the theory of intelligent design. These ID opponents, who remain unidentified, complained to Dean Ben Kelley of the School of Engineering and Computer Science, who promptly pulled the plug on Marks' lab and took down the accompanying website."

"Marks has no intention of following his friend's departure. And thanks to a two-hour meeting Aug. 9 with Dean Kelley and Baylor Provost Randall O'Brien, he also now has no need to leave. With attorneys for both sides present, Kelley agreed that Marks was free to resume work in the informatics lab on his own time and repost his website, provided a disclaimer accompany any ID-advancing research to make clear that the work does not represent the university's position.

"Marks told WORLD he considers the situation 'wonderfully resolved' and expressed his continued enthusiasm for the school's vision and 'the commitment of Baylor to the Lordship of Jesus Christ.'

"Marks' attorney John Gilmore said the resolution with school officials stemmed from the willingness of all parties to approach each other with respect, an atmosphere often lacking during Dembski's ordeal seven years ago. Gilmore

> was quick to warn that opposition to ID research at Baylor may still lie ahead, but he is persuaded that it will not originate with the school's top brass: 'I was concerned at one point that the shutting down of Professor Marks' website was the beginning of an institutional purge of intelligent design at Baylor. I came away from that meeting absolutely convinced it's not.'
>
> "Provost O'Brien insisted that the initial shutdown of Marks' lab and website was nothing more than an effort to comply with university policy, which forbids professors to create even the impression that their personal views represent Baylor as an institution. O'Brien told WORLD that the university's stance on origins is inherently theistic given its commitment to Christian truth, but that many faculty members disagree on the merits of ID.
>
> " 'We hire only committed Christians at Baylor,' he said, before noting that one professor at the school is Jewish, the lone exception to the rule. 'Therefore, we have no one on our faculty who believes in atheistic evolution. We have many professors who believe in theistic evolution. We also have a number of professors who advocate intelligent design.' "
>
> "'The long journey Baylor is attempting cannot happen without a few bumps in the road, bumps that can often be addressed through good faith dialogue among believers with differing views,' Marks said. 'In the current matter, that is what happened.' "

42. Mike Gene, "Do It On Your Own Time," Telic Thoughts, August 28th, 2007

43. O'Leary "Baptist University pulls plug on Evolutionary Informatics Lab - links to intelligent design fatal," Uncommon Descent, September 1, 2007

    > "Yesterday, the Baylor University administration shut down Prof. Robert Marks's Evolutionary Informatics Lab because the lab's research was perceived as linked to intelligent design (ID).""

44. "Weird Situation at Baylor Gets Weirder," The Austringer, 01 Sep 2007

45. Sal Cordova, "My retreat from the public view," Uncommon Descent, 01 Sep 2007

    > "I have been accepted into a graduate program at Johns Hopkins University. I attempted to apply both at Hopkins and at Baylor. I was attempting to work with Dr. Robert Marks at the evolutionary informatics lab. I got the sense Baylor was putting Dr. Marks in their gunsights and that they would also put me indirectly in their gunsights as well if I worked at the informatics lab."

46. "R.J. Marks II EXPELLED?," molecular B(io)LOG(y), September 2, 2007

47. posted by Denyse O'Leary for Bill Dembski, "Backgrounder to Robert Marks's lab shutdown: Baylor revokes Dembski's research fellowship 2006," Uncommon Descent, 3 September 2007

"On Thursday (12.07.06) I learned it was definite that Baylor University was revoking a postdoctoral fellowship that I held in the Department of Electrical and Computer Engineering. Last month (11.06) I was appointed as Senior Research Scientist in that department to work on a project in information theory with Prof. Robert Marks. That project was funded through a grant that he procured specifically for me to work with him. Here are the facts:

"(1) Robert Marks , Distinguished Professor in the Department of Electrical and Computer Engineering, procured a small grant from the LifeWorks Foundation so that I could work with him on the Baylor campus. The grant was to extend for two years. Robert Marks and I have been working on a project in information theory since the spring of 2005.

"(2) This grant and the invitation to work with Prof. Marks was entirely at his initiative. I had worked at Baylor from 1999-2005 as Associate Research Professor in the Conceptual Foundations of Science. During that time my work on intelligent design was continually vilified at Baylor and I personally was ostracized from much of the Baylor community. Nonetheless, during that time I always found the engineering faculty congenial, who invited me regularly to give special lectures on intelligent design to their students. In the past, I've had postdoctoral fellowships at MIT, Princeton, University of Chicago, etc. At these institutions, I always found that senior faculty members can hire any qualified person to work with him, no questions asked. Thus, despite my controversial history at Baylor, I felt that my place in engineering and Robert Marks's lab would be secure. Hence my willingness to accept Prof. Marks's offer to work with him back at Baylor.

"(3) Having procured the grant from Lifeworks, Robert Marks had it processed through normal administrative channels. At no point in the process did the Baylor administration raise any flags. The documentation on the grant clearly specified the work to be done and my role (by name as a third-party beneficiary) in it. Ultimately President John Lilley of Baylor signed off on the grant, sending a letter with his signature to the Lifeworks Foundation thanking them for it (I have a pdf scan copy of that letter).

"(4) My appointment as Senior Research Scientist in Baylor's Department of Electrical and Computer Engineering began November 2006. The dean and department head were aware of my presence in the department and for one month raised no objection. I was given a small windowless office in the engineering building (Rogers 305A), which I planned to use once or twice a week. I had no teaching duties this was strictly a research position. Also, I had access to the Baylor library and online journals.

"(5) My day-job is as Research Professor in Philosophy at Southwestern Baptist Theological Seminary , from which I derive my salary and benefits. I commute to Ft. Worth for that job two to three times per week. In procuring a grant for me to work with him, Robert Marks was fully aware of that position at Southwestern. Moreover, my immediate superior in Southwestern's School of Theology, Prof. Douglas Blount, was aware that I had this

appointment at Baylor. Neither saw any conflict of interest in my being at both Baylor and Southwestern (more on this in point (9)).

"(6) On Monday (12.04.06), I was called into Ben Kelley's office (the dean of Baylor's School of Engineering and Computer Science) at 7:00am in the morning. Robert Marks attended the meeting. Dean Kelley informed us that there were concerns with my being again on campus (I had been on faculty at Baylor from 1999 to 2005) and that I might need to be let go 'for the good of the School of Engineering and Computer Science.' Dean Kelley declined to answer who was raising these concerns (Robert Marks pressed him twice on this point). Nor did Dean Kelley elaborate on the nature of the concerns, though he did mention that resources to the School of Eng/CompSci might be cut on account of my presence there. At no point did he bring up my connection with intelligent design (ID) as a reason for concern. Nor did he question my qualifications to work in the engineering school (in fact, he commended my mathematical sophistication).

"(7) On Tuesday (12.05.06) there was a meeting of Baylor's Faculty Senate President John Lilley and Provost Randall O'Brien were in attendance. At that meeting, President Lilley remarked that my appointment was to be revoked and that the grant Robert Marks procured for me to work with him would be returned to the LifeWorks Foundation. The reason given was that a 'technicality' had been missed in the processing of the grant (no elaboration at that time of what this technicality was). On Wednesday (12.06.06) , Dean Kelley confirmed that Baylor would be refunding the grant to LifeWorks and that Provost Randall O'Brien concurred with this decision.

"(8) On Thursday (12.07.06) Robert Marks and another distinguished professor of engineering at Baylor, Walter Bradley, met with Dean Kelley in one last effort to persuade him not to pull the plug on my appointment (earlier in the week they had written forceful detailed letters urging that I be permitted to remain in the engineering school). The 'technicality' that had been missed in the processing of the grant was at this meeting finally divulged: Dean Kelley and Jim Farison (the head of the Department of Electrical and Computer Engineering) had not been properly notified that I would be joining the Department of Electrical and Computer Engineering. But they had not raised any objection the whole prior month (my name and title were prominently displayed on my office door as well as in front of the suite of offices of which it was a part). Moreover, when Robert Marks offered to 'reprocess' the grant, Dean Kelley informed him that this was not an option and that I was too great a 'liability' for Baylor. He did not elaborate on why I would be a 'liability.'

"(9) On Friday (12.08.06) Baylor claimed finally to have found a good reason to remove me, namely, a policy that forbids postdocs from having full outside employment (which I do with my job at Southwestern Seminary). On examining the BUPP (Baylor University Personnel Policy and Procedures http://www3.baylor.edu/BUPP), one finds no such policy. Regard-

less, whether this was a formal or informal policy, the president of the university had signed off on a grant which listed me as a third-party beneficiary. The university had a legal obligation to honor its commitments (my attorney indicated that I could sue Baylor it didn't). Instead, the university decided to return the money for the grant simply so that I would no longer be associated with Baylor.

"(10) Later on Friday (12.08.06) I received an email from Dean Kelley indicating that he needed to talk to me about clearing my desk and returning my keys. I asked him to send me a formal letter to indicate when my appointment officially ends and the reasons for its ending I received such a letter as an email Monday, 12.11.06, stating that I had been terminated Friday 12.08.06 but giving no reasons for my termination.

"(11) On Saturday (12.09.06), prior to any official notification that my position with Baylor was over, my Baylor ID card no longer worked to take my family to the cafeteria. Also, on that day, my Baylor email address (William_Dembski@baylor.edu), which had worked since 1999 (it had never zeroed out even in my year-long absence from Baylor since June of 2005) now yielded the following response to people who attempted to send email to it: 'Recipient address rejected: Account Disabled.' I had been erased.

"(12) Sometime in December or January, Baylor sent back to the LifeWorks Foundation the entire amount of the grant that Robert Marks had procured for me to work with him. Question: Has Baylor throughout its history ever returned grant money and, if so, under what circumstances?"

48. "Another example of Atheists, er, Baptists against ID," The Atheocracy, September 4, 2007

49. PZ Myers, "Baylor episode is getting wider circulation," September 4, 2007

50. Philosopundit "More ID Controversy at Baylor," Typepad.com, September 04, 2007

    "From the hiring of William Dembski to the tenure case of Francis Beckwith my alma mater is a hot bed of intelligent design controversy. Now, I see there's another one over an engineering professor, Robert Marks II.

    "When I was at Baylor, at least, one or two of the philosophy professors were sympathetic with intelligent design. Once, I remember in class we were discussing the relationship between Aristotle's 'metaphysical biology' and his ethics in After Virtue and the professor mentioned something like 'some people think teleology is coming back in biology.' In retrospect I believe he was referring to intelligent design. The year after I finished up there that same professor was, if I'm not mistaken, influential in bringing Dembski to campus. I also took a course with that professor on the politics of higher education and the role of religion in higher education at religiously affiliated universities."

51. "A funny thing happened on the way to the laboratory: Another example of how the process is rigged against Intelligent Design," vere loqui: Observations in Defense of the Obvious, September 04, 2007

52. William Dembski "Chronicle of Higher Education reports on Evo-Info Lab controversy," Uncommon Descent, 4 September 2007

53. "Censorship or Intolerance?" Southern Baptist in NC, September 5, 2007

    > "I remember well when the movie 'The Last Temptation of Christ' was removed from the library at Southeastern Baptist Theological Seminary. The calls of censorship rang from the rafters of academia. When Dr. Lewis Drummond became the first conservative at SEBTS he asked Dr. Billy Graham to preach the inaugural sermon. As a young Christian I literally witnessed seminary students, supposedly called by God, protest Dr. Billy Graham speaking in a chapel service. Then, some of these same students, placed yellow dye in the fountain in protest of the faculty that left and were then replaced by the incoming administration.
    >
    > "Why tell about this incident? It was during this time that I heard about conservatives being intolerant views they did not agree with and they would censor debate. Well, after reading this article here, my call is to Baylor University."
    >
    > "Where is the outrage at the censorship taking place in academia? Where is the call to the accrediting agencies about this undoubtedly open expression of intolerance and the shutting down of academic freedom? We are not speaking about a professor that has lied about his credentials and is imposing fundamental landmarker beliefs in a leading liberal divinity school. We are seeing the censorship of a world-class expert in the field of evolutionary computing.
    >
    > "My only question is this. Where is the outrage in the academy?"

54. "Informatics Lab Grows," Professor Smith's Weblog, September 5th, 2007

    > "On the heels of my post on Dr. Marks and the Evolutionary Informatics lab, it appears that the lab is growing by one member. Dr. William F. Bassener is joining the ranks. This is welcome news. Dr. Bassener has already been rather prolific in his career with a book and numerous peer-reviewed articles as well as some more in progress. ID science is attracting some serious talent."

55. BOTNIK, "Academic Freedom Expelled from Baylor University," molecular B(io)LOG(y), September 5, 2007

56. Erin Roach "I.D. rift hits Baylor again," Baptist Press, Sep 5, 2007

    > "WACO, Texas (BP)–Baylor University officials ordered the shutdown of a personal website of one of a handful of the school's distinguished professors

because of anonymous concerns that the site, hosted on the university's server, supported Intelligent Design.

"Robert Marks, distinguished professor of electrical and computer engineering at Baylor, launched a website called the Evolutionary Informatics Lab in June to examine whether Darwinian processes like random mutation and natural selection can generate new information.

"Marks' conclusions, as explained on the website, placed limits on the scope of Darwinism and offered scientific support for Intelligent Design.

"In July, a podcast interview with Marks appeared on a website run by the pro-ID Discovery Institute, and a week later Benjamin Kelley, dean of engineering at Baylor, told Marks to remove the Evolutionary Informatics website immediately.

" 'This is a big story, perhaps the biggest story yet of academic suppression relating to ID,' William Dembski, a research professor in philosophy at Southwestern Baptist Theological Seminary, told Baptist Press.

" 'Robert Marks is a world-class expert in the field of evolutionary computing, and yet the Baylor administration, without any consideration of the actual content of Marks' work at the Evolutionary Informatics Lab, decided to shut it down simply because there were anonymous complaints linking the lab to Intelligent Design,' Dembski said.

"In response to the dean's order to remove the Evolutionary Informatics website, Marks requested a meeting with Baylor legal counsel to resolve the matter. Six days before the scheduled Aug. 9 meeting, Kelley entered Marks' Baylor webspace and, without his consent, removed all references to the Evolutionary Informatics Lab, according to a timeline Dembski sent to BP.

"The Aug. 9 meeting involved John Gilmore, an attorney who advised Dembski in 2000 and now represents Marks, Baylor Provost Randall O'Brien, Kelley and Baylor attorneys including Charles Beckenhauer, chief counsel for the school. Baylor officials asked that Marks add a disclaimer to his website and remove anything that could imply the lab is a Baylor initiative.

" 'Randall O'Brien signs off on the EIL site going back up and closes the meeting with prayer,' Dembski's timeline states."

" 'You have to understand, in the current academic climate, Intelligent Design is like leprosy or heresy in times past,' he said. 'To be tagged as an ID supporter is to become an academic pariah, and this holds even at so-called Christian institutions that place a premium on respectability at the expense of truth and the offense of the Gospel.'

"Dembski said he knows of several faculty members at Baylor who support Intelligent Design, but they are mostly younger faculty who don't have tenure and don't speak up on the topic. An old guard at Baylor, he said, supports secularization.

" 'John Lilley, in attempting to pacify that old guard, and perhaps because

of a sense of foreboding about how Baylor might be perceived in the wider university culture if it were seen as supporting Intelligent Design or as even allowing it merely a presence, has therefore decided to come down hard against it,' Dembski said."

" '... [Marks] was a star in his department at the University of Washington in Seattle for 26 years before Baylor recruited him, and now Baylor is subjecting him to treatment that even so 'liberal' and 'secular' a place as UW would find unconscionable,' Dembski added. 'Yes, there are academic freedom issues here, but at this point the issue is one of plain decency.'

" Robert Crowther of the Discovery Institute's Center for Science and Culture told Baptist Press the institute is watching the Marks situation from an academic freedom standpoint.

" 'We're deeply concerned that the administration at Baylor University has really not shown any support for academic freedom or freedom of scientific inquiry in shutting down a website and a research project of one of their distinguished faculty,' Crowther said. 'We find that very troubling. It does show a certain trend at Baylor.'

"Crowther said he believes Intelligent Design has become such a controversial issue in academia because of the scientific threat it poses. The Scopes Trial should have settled the issue, he said, but discoveries since then have altered the discussion.

" 'What has changed is the science. We know things now and there are new discoveries being made all the time that are leading a number of scientists to not just question Darwinian evolution but to actively pursue research into Intelligent Design," Crowther said. "The thing that is driving this really is the science. We wouldn't be having the debate if there wasn't something going on in science that was causing a lot of questions to rise from most of the scientists.' "

57. William Dembski, "Baptist News reports on the Evo-Info Lab Controversy," Uncommon Descent, 5 September 2007

58. Robert Crowther, "Academic Freedom Expelled from Baylor University," Evolution News & Views, September 5, 2007

"Unfortunately for Robert Marks, Distinguished Professor of Electrical and Computer Engineering at Baylor, he didn't keep his views to himself. Perhaps he was still under the misperception that tenured professors and proven researchers could still pursue scientific inquiry without fear of institutional reprisal.

"Suffering from a delusion of academic freedom last year, Marks decided that research related to evolution and intelligent design, specifically the informational generative capabilities of Darwinian evolution, could be an interesting and fruitful subject for scientific investigation. Marks teaches signal processing and imaging intelligence, his current research is on computational

intelligence, fuzzy systems and neural networks, and he has a recently published book on related subjects published by no less than Oxford University. Tying together all of these subjects, one of his biggest areas of research and study is evolutionary computing, which has to do with emulating evolution on computers and is a robust and growing field of engineering.

"Marks discussed the subject of evolutionary informatics in an interview conducted by CSC's Casey Luskin on ID The Future back in July. He described evolutionary informatics as basically conducting simulated evolution on computers. For better or worse Dr. Marks mentioned that he was working with William Dembski on some of his research into information and evolution computing. Just mentioning Dembski these days at Baylor is grounds for dismissal apparently or at least for dismissal of your life's work."

"Dr. Marks has gone the extra mile in trying to accommodate any legitimate concerns Baylor administrators may have had about his evolutionary informatics website–even agreeing to put a disclaimer on the site making clear that it represented his views as a faculty member, not the university as a whole. But Baylor administrators have now spurned Marks' efforts to accommodate them, apparently reneging on a compromise brokered last month by Marks' attorney. Not only has Baylor deleted Marks' website about his evolutionary informatics research, its lawyer is now outrageously charging Marks with misconduct in creating it and implying that Marks has no academic freedom to pursue research in evolutionary informatics as a faculty member at Baylor.

"Under pressure from the administration, Marks agreed to rename the project 'Evolutionary Informatics Group' since calling it the 'Evolutionary Informatics Lab' bothered anonymous complainers at Baylor because they said it connoted a physical presence. Of course, a 'lab' in science circles often refers to a group of scientists participating in related research and collaboration at differing locations. Bickering over whether or not it was a lab probably seemed a silly thing to a researcher like Marks, and so he agreed to change the name. Of course, for the anti-ID thought police in Baylor's administration anything less than the complete annihilation of any research related to intelligent design wasn't good enough. Changing the name didn't go far enough. The work itself had to be stifled. After all, it's not the name that is truly threatening, it is the research that can't be allowed to progress."

59. William Dembski, "Discovery Institute Issues Press Statement Concerning Evo-Info Lab," Uncommon Descent, 6 September 2007

60. Darin M. Wood, "Academic Freedom at Baylor University?" On my mind today, September 06, 2007

    "The surprising thing is that Baylor University, the oldest university in our fair state and, at least traditionally, a school of religious heritage, has engaged in a war against Intelligent Design. I was always under the impression that

one of the fundamental purposes of higher education was to teach one to think critically. To do so means to critically evaluate all possible options. Of course, to do that means one has to have all the options available! To discredit one is, definitively, NOT academic freedom."

61. Bradford, "Updating Robert Marks and Baylor," Telic Thoughts, September 06, 2007

    "It should be noted here that Marks had received a grant from an outside organization that was administered through Baylor University to do this research. And that grant had been approved by the President of the University himself. Interestingly, the involvement of William Dembski caused Baylor to return the grant."

    "Think about that. When Guillermo Gonzalez was denied tenure what was the most plausible argument put forth by anti-IDists? Remember how Gonzalez's alleged failure to secure grants was cited? It's about money right? Wrong. Sometimes those underlying personal views of the world, that people hold so near and dear, motivate them to take all sorts of anti-academic, anti-science and anti-intellectual actions that are otherwise anethema. Baylor, you are a case study."

62. William Dembski, "Baylor's Main Argument Against the Evo-Info Lab Reply to Lori Fogleman," Uncommon Descent, September 06, 2007

    "In her remarks to the Baptist Press, Lori Fogleman (well beloved Baylor sports personality who regularly comments on 'Inside Baylor Sports' for the Lady Bears) offers the following argument against allowing Robert Marks's Evolutionary Informatics Lab to continue at Baylor:

    > "This isn't about the content of the website. Really the issue is related to Baylor's policies and procedures of approving centers, institutes, products using the university's name,' Fogleman said. 'Baylor reserves the exclusive right to the use of its own name, and we're pretty jealous in the protection of that name. So it has nothing to do with the content but is all about how one goes about establishing a center, an institute, a product using the university's name."

    "So she is saying that the problem was procedural Robert Marks did not follow proper procedure for his lab to be approved and permitted on the Baylor server. But this argument does not stand. Consider the following:

    "(1) Robert Marks has another research entity on the Baylor server: 'The Baylor University Time Scales Group' (note the Baylor URL: web.ecs.baylor.edu/faculty/marks/Research/TimeScales). This research group (a collaboration between engineering and mathematics) has been allowed to proceed unimpeded by Baylor, using its name and absent any disclaimer. Is Baylor now, to maintain a foolish consistency, going to take down that site as well? Is it going to require disclaimers when previously it didn't? Note

that Prof. Marks, by way of compromise, was willing to rename the 'Evolutionary Informatics Lab' the 'Evolutionary Informatics Group,' but this too was unacceptable to the Baylor administration."

"(4) Throughout this controversy it needs constantly to be borne in mind that the Baylor administration went into Robert Marks's personal webspace not because they had any impartial assessment of the merits of the research and judged it to be so substandard or outside the pale that it didn't deserve to be on the Baylor server but solely because anonymous (i.e., to this point unnamed) critics linked the research of the lab to intelligent design. If one actually reads the research papers on which Robert Marks and I collaborated, one would see that they fall squarely within the fields of information theory and evolutionary computing. They are under review with standard journals in the field. They are part of an ongoing conversation about the power of evolutionary processes. Benjamin Kelley, the dean of engineering at Baylor, who removed the Evolutionary Informatics Lab website from Robert Marks's space on the Baylor server, does not have the expertise to assess the work of the lab a fact he admitted to me back when I was a senior research scientist at Baylor briefly last year. The provost, Randall O'Brien, has his expertise in theology; the president, John Lilley, has his expertise in music. None of them had even the faintest trace of knowledge about the actual work of the Evolutionary Informatics Lab. Lori Fogleman is therefore correct about this removing the Evolutionary Informatics Lab website from the Baylor server was not about content. The Baylor administration removed it simply because of guilt by association."

"(5) Controversy has not kept Baylor from lending its name to at least one website on the Baylor server, namely, Marc Ellis's Center for Jewish Studies. Ellis, like Robert Marks, is a distinguished/university professor at Baylor; unlike him, Ellis is not a Christian, and unlike most of his fellow Jews, seems to side more readily with the Palestianians than with the Israelis. Moreover, he rubs shoulders with Norman Finkelstein, who claims Jews are exploiting the 'holocaust industry.' On the Center for Jewish Studies website, which is carried on the Baylor server, Ellis has a page titled 'Great Thinkers.' Among the great thinkers listed are Martin Luther King Jr., Mahatma Gandhi, and Dorothy Day. Also included among the great thinkers is Marc Ellis, depicted with a half-tone, half-lit photo, and captioned with 'Does a world without struggle about God understand the image of solidarity and solitude any better than those who always and everywhere know who God is?' There is no disclaimer about Baylor product branding on any of these pages of the Center for Jewish Studies. So, in regard to the 'Great Thinkers' page, are we to understand that Baylor is happy to place Ellis in the same company as King, Gandhi, and Day?"

63. Anika Smith, "Baylor University Denies Research Scientist's Academic Freedom," Evolution News & Views, September 6, 2007

"'Baylor University has proven yet again that academic freedom has been thrown off campus and academic persecution is now the norm,' said Discovery Institute's Casey Luskin in reaction to Baylor University's deletion of a professor's research website, which focused on evolutionary systems and informatics. 'It is simply unconscionable that a major university would so trample a scientist's right to freedom of scientific inquiry,' "

" 'What has happened to Professor Marks is censorship, pure and simple,' added Luskin.

"Discovery Institute is encouraging Baylor alumni and Texas residents to write to the University's board of regents and demand that the university reinstate academic freedom and protect the rights of scientists and scholars to pursue their research without fear of reprisal."

64. William Dembski "Baylor Public Relations on Marks Evo-Info Lab in Free Fall," Uncommon Descent, 7 September 2007

"The Baylor President, Provost, Dean of Engineering, and Baylor legal counsel need to get their story straight"

65. Baylor U. Shuts Down Prof's ID Website, CR (Church Report) Daily, Sep 07, 2007

"Officials at Baylor University in Waco, Texas, ordered the shutdown of one of the school's distinguished professors' personal websites because the site, hosted on the university's server, supported Intelligent Design. Robert Marks, distinguished professor of electrical and computer engineering at Baylor, launched a website called the Evolutionary Informatics Lab in June that offered scientific support for Intelligent Design."

"Robert Crowther of the Discovery Institute's Center for Science and Culture said ID has become such a controversial issue because it challenges traditional science. 'We know things now and there are new discoveries being made all the time that are leading a number of scientists to not just question Darwinian evolution but to actively pursue research into Intelligent Design. ... We wouldn't be having the debate if there wasn't something going on in science that was causing a lot of questions to rise from most of the scientists.' "

66. O'Leary, "The Great Escape A tribute to Bob Marks," Uncommon Descent, 8 September 2007

"What does Bob Marks want? He wants the right to run computer simulations at Baylor that might (possibly) reduce confidence in Darwinian evolution."

"Last night, my mom and I were watching a video of one of my favourite movies - The Great Escape. Suddenly, some of the dialogue seemed startlingly relevant to the struggle of scientists like Marks.

"Listen, as the German Colonel Von Luger explains to the Allied prisoners of war:

> "We have in effect put all our rotten eggs in one basket, and we intend to watch this basket carefully. Very wise. You will not be denied the usual facilities. Sports, a library, a recreation hall, and for gardening we will give you tools. We trust you to use them for gardening. Devote your energies to these things. Give up your hopeless attempts to escape. And, with intelligent cooperation, we may all sit out the war as comfortably as possible."

"What institutions like Baylor want is precisely that - faculty who will just 'sit out' the war between rampant materialist atheism and all non-materialist traditions, in the comfort of a Christian environment.

But Group Captain Ramsey responds,

> "Colonel Von Luger, it is the sworn duty of all officers to try to escape. If they cannot escape, then it is their sworn duty to cause the enemy to use an inordinate number of troops to guard them, and their sworn duty to harass the enemy to the best of their ability."

"Ramsey's reply is the proper duty of the Christian (or other non-materialist) academic in these times.

"It is also the only safe one. There is no surprise, really, in the fact that today's academic environment is quickly losing touch with the goal of intellectual inquiry. As Mario Beauregard and I show clearly in The Spiritual Brain, materialists do not believe in the reality of the mind. In that case, it is more humane as well as easier to just program the young meat puppets to be whatever is needed, and sideline any mis-programmed puppets who interfere.

"Only a non-materialist tradition - in which intellect functions as a cause of events - can responsibly support intellectual freedom.

"A Christian you say? Well then, do not be a good prisoner of your Christian campus. Be a Bob Marks. BE a problem!"

67. HERMAGORAS "With Friends like Dembski (again)," INTELLIGENT DESIGN IS NOT SCIENCE, September 8, 2007

> "PZ and I seem to be more on Marks's side than Dembski. From the first, he has made things worse. From announcing the superpower of the EIL before they'd published anything ('it promises to put people like Christoph Adami and Rob Pennock out of business'), to the absolutely stupid hoax letter – which I still think must have been a dream, it was so deliciously mismanaged – to his focus on negative media attention now, he's got to be making Marks more and more isolated. I wonder if he cares about that, or if it's just that he's got an unfailingly tin ear."

68. DRUDGE RETORT, "I.D. rift hits Baylor again," September 8, 2007

> "Baylor University officials ordered the shutdown of a personal website of one of a handful of the school's distinguished professors because of anonymous

concerns that the site, hosted on the university's server, supported Intelligent Design"

69. Aristotle, "Baylor University Shuts Down Professor's Private Site for Challenging Evolution," A Faithful Rebel, September 08, 2007

    "There is a growing controversy over the action of Baylor University in shutting down a personal web site of one of their most distinguished professors. The only crime is that the professor dared to challenge Darwinian evolution. His scientific conclusions supported Intelligent Design."

    "This is perhaps one of the most blatant examples of a violation of the principle of academic "freedom" in the history of U.S. education. That a professor would be ordered to remove his own private web site because his scientific conclusions question the scope of Darwinian evolutionary theory shows that evolution, much like global warming, has become a dogma for the scientific community. They are not even willing to question it.

    "It's certainly not good science. Baylor ought to be ashamed, and Kelley should apologize to professor Marks."

70. William Dembski, "Of Groups and Labs at Baylor," Uncommon Descent, 8 September 2007

    "You might wonder whether Prof. Robert Marks is the only faculty member at Baylor who has a 'group' or a 'lab' not blessed by Baylor administration. The other day I mined a bunch of cases here at UD where the terms 'group' and 'lab' are used at Baylor, almost certainly without the Baylor administration's blessing or knowledge."

    "Here are some that I found in a few minutes of googling the Baylor server: (i) The Robert R. Kane Research Group (chemistry); (ii) Rene Massengale Research Group (biology); (iii) The Klausmeyer Research Group (biochemistry); (iv) Jeffrey Olafsen's Nonlinear and Nonequilibrium Dynamics Group, aka Nonlinear Dynamics Laboratory (physics); (v) The Stanford Lab (Matthew Stanford's lab in neuroscience)."

    Well, there's more:

    "The Baylor University Time Scales Group" (note the Baylor URL: web.ecs.baylor.edu/faculty/marks/Research/TimeScales) just got a big NSF Grant and is finishing another. No one with that group ever asked anyone at Baylor whether it was okay to form this group or put it on the Baylor server. It's something research groups do. And no one at Baylor is upset about it.

    "Robert Marks has another research group on the Baylor server with Randall Jean: The Microwave Applied Metrology Lab (note the Baylor URL: web.ecs.baylor.edu/faculty/jean). Prof. Marks does research with Prof. Jean. It has been posted with no changes since the first year Marks got to Baylor 2003.

"Prof. Marks's new department chair (electrical and computer engineering), who started this fall 2007, is Prof. Kwang Lee. Prof. Lee moves to Baylor from Penn State where he ran The Power Systems Control Laboratory (www.ee.psu.edu/faculty/lee/lee1.html). It's still at Penn State. Given what Baylor did to Prof. Marks's Evolutionary Informatics Lab, why should Prof. Lee risk moving his lab to Baylor? Question: Was that lab okayed by Penn State? I'll bet it wasn't.

"At the University of Washington, where Prof. Marks was on faculty for 26 years, he ran The Computational Intelligence Applications Lab (note the acronym: CIA Lab). Prof. Marks ran it, with no approval from anybody, with Mohamed El-Sharkawi. They wrote numerous papers together and got millions in grants for this lab. El-Sharkawi still runs the lab at cialab.ee.washington.edu. Here's the kicker: When Prof. Marks first came to Baylor, he called his research effort 'The CIA Lab' it's still mentioned at web.ecs.baylor.edu/faculty/marks/Marks/Bob/Bob2004.htm. Note that Baylor and The CIA Lab are listed right next to each other. Prof. Marks used 'CIA Lab' as the entity under which he conducted his research at Baylor for several years. You'd think if Baylor got mad at Prof. Marks for anything, it would be for placing his research under 'The CIA Lab.'

"THIS IS WHAT RESEARCH PROFESSORS AT RESEARCH UNIVERSITIES DO!!! To attract funds, research professors form groups and labs because there's a synergy in numbers that enables research to attract funding and flourish. That's how the game of 'supply side academics' gets played. Interestingly, no one publicly criticizing Prof. Marks at Baylor (President, Provost, Dean) has ever attracted a cent of research funding for their own scientific work/scholarly activities. (Prove me wrong!) The President, John Lilley, is in music. The Provost, Randall O'Brien, is a Baptist Pastor. And Prof. Marks's Dean, Benjamin Kelley, has a teaching, not a research, background. In particular, Kelley has admitted that he does not understand the work of the Evolutionary Informatics Lab.

"It's infuriating that none of the critics of the EIL at Baylor has offered a single comment about the substance of the papers they removed from Prof. Mark's server. NO ONE!"

71. Tim Woods, "Web site sparks new intelligent design battle at BU," Waco Tribune-Herald, September 09, 2007

"A Baylor University professor is fighting university officials to have the school restore his personal Web site in a battle some link to academic freedom and intelligent design.

"About a week after informing distinguished professor of electrical and computer engineering Robert Marks that his Evolutionary Informatics Lab site would need to be taken down, Benjamin Kelley, Baylor's dean of engineering, ordered the site be removed without Marks' permission, according to Marks' attorney, St. Paul, Minn.-based John Gilmore.

"The site, which was on a university server, has been down since early August."

"In taking the site down, Kelley 'unilaterally shut down this venue of academic freedom,' Gilmore wrote in a letter to Baylor general counsel Charles Beckenhauer on Thursday.

"According to Gilmore, as well as a series of e-mails between Beckenhauer and Gilmore, Baylor said it took the site offline until sufficient disclaimers and minor changes were made to the site, which would make clear that the evolutionary informatics work is not endorsed by the university or supported by university resources. Gilmore said that he and Marks have been amenable to Baylor's request for a disclaimer and that they believe the real issue is one of academic freedom.

" 'I don't think they wanted to take yes for an answer,' Gilmore told the Tribune-Herald on Wednesday. '(The disclaimer) might not have satisfied the absolutists who don't want anyone at Baylor to think, even on their own time, about I.D. and its related issues. . . . Baylor has an obligation to defend Bob Marks' position. Unfortunately, they've been taking the position of his persecutors. . . . It's viewpoint discrimination.'

"Gilmore also said Baylor might be causing themselves more trouble than they hoped for by dragging their feet in restoring Marks' Web site.

" 'Somebody wants a crisis,' Gilmore said. 'It's not us, but somebody wants a crisis and I can't, for the life of me, understand it. If the goal is not to draw attention to intelligent design at Baylor and keep it under the radar, this is having precisely the opposite effect.' "

"Gilmore, however, says that Marks, who spent 27 years at the University of Washington before coming to Baylor three years ago, has never tried to represent his work as being Baylor-related. He says the parties agreed at an Aug. 9 meeting, attended by Beckenhauer, Gilmore, Marks, Kelley, provost Randall O'Brien and engineering department chair Kwang Lee that 'a disclaimer would be put on the Web site and that it would then go back online as the provost had promised at the close of the meeting.' "

"Dembski, who has collaborated with Marks on research projects and admits that he has become somewhat of a polarizing figure at Baylor, says he is convinced, despite Baylor's denials, that Marks' site was taken down because of its connection with intelligent design.

" 'It's not the university's place to put restrictions on it,' Dembski said. 'I've been at Notre Dame, Princeton, Cornell, the University of Chicago, MIT, and it's just unimaginable that they would mess with a distinguished professor about this. . . . It's just outrageous. If the full story comes to light on this, it's going to look terrible for Baylor. . . . I think what we're talking about here are restrictions on academic freedom.' "

"Gilmore and Dembski, who was represented by Gilmore during the battle over the Polanyi Center, said they believe Baylor president John Lilley over-

ruled what he says was an agreement after the Aug. 9 meeting to put Marks' site back online.

" 'The president is the only one who would have the authority to overrule the provost,' said Dembski, who is a fellow at the Discovery Institute. 'Why didn't it stick? I would have to say it's the president.' '

"Barry said that Lilley would not comment on the matter"

"Regarding the allegation that Lilley overruled an Aug. 9 agreement, Barry said, 'That seems to me to be highly subjective. I'm not sure on what grounds Mr. Gilmore (and Dembski) make that conclusion.'

Dembski also said that he found at least five labs or groups set up by Baylor faculty that contained no disclaimers stating that the work is not related to Baylor in any way. 'Why is the rationale so different?' he said. 'It's because this is intelligent design and intelligent design is so controversial.' "

72. Robert Crowther "Baylor University Accused of Viewpoint Discrimination in Suppression of Pro-Intelligent Design Scientist," Evolution News & Views, September 9, 2007

73. "Expelled Filmmakers Want to Talk to Baylor President About University's Crackdown on ID Scientists" Evolution News and Views, September 9, 2007

"Academic persecution has long been a serious problem for intelligent design advocates in academia. And you don't even have to be an ID proponent to get in trouble, you can simply be in trouble for expressing doubts about Darwinian evolution."

74. William Dembski "Baylor Academic Discrimination Crisis Makes Sunday Front Page of Waco-Trib," Uncommon Descent, 9 September 2007

"PZ Myers of Pharyngula has stood up on the side of academic freedom at Baylor University for Robert Marks, II."

"Baylor episode is getting wider circulation Posted on: September 4, 2007 3:07 PM, by PZ Myer"
"The story of the Robert Marks debacle has now made the pages of The Chronicle of Higher Education. If the account is accurate, I'm going to do something you'll only rarely see: I'll take the side of the creationist.... The problem is that Baylor was more than a little ham-fisted in intruding on Marks' academic freedom. I categorically reject Marks' whole philosophy and I'd probably call him delusional, but it is the professor's job to talk freely about wacky ideas if he wants. A web page that can be shared (and laughed at) is a reasonable part of the commitment to public communication, and I don't think Baylor should restrict it. Even if the professor is a bit of an embarrassment, and the subject is a sore spot for the university..."""

"PZ Myers has previously demanded: 'The IDists love to quote me, because I am rather militant in my opposition to their lies. . . .The only appropriate response should involve some form of righteous fury, much butt-kicking, and the public firing of some teachers, many school board members, and vast numbers of sleazy, far-right politicians I say, screw the polite words and careful rhetoric. It's time for scientists to break out the steel-toed boots and brass knuckles, and get out there and hammer on the lunatics and idiots.'

"Were Myers to fully support objective science, would he not insist on the most rigorous examination of Evolution to ensure that it is the most robust parsimenous theory possible, without even the perception of a flaw? Would he not welcome the strongest critique Marks could make? Who knows, Myers may yet affirm our full unalienable rights of speech, religion and academic freedom as preserved by the First Amendment, with equality for all - even for theories diametrically opposed to his.

Gentlemen, Start your engines - and lets make level the playing field so that the best theory wins."

75. "3rd Strike for Baylor" l3ruceWayneBlog, September 9, 2007

"The big story on ID right now is Baylor University (which ironically means 'unity within diversity') and its shutting down of Prof. Robert Marks' (who is a distinguished Professor of Electrical and Computer Engineering) research lab on 'evolutionary informatics,' due to anonymous complaints about its ties with ID."

76. Professor Smith's Weblog, "Science Blog of the Year?" September 9, 2007

"I surfed over to the lion's den today to check out what PZ Myers is up to. He's the reigning science blogger of the year. I had to go to the second page, through 20 posts before I found one about science. This is a pretty clear indication that Darwinism are not really about science. Here, you have one of its most outspoken advocates and he can't even find time to write about science in the last 20 posts?"

"Some people who've asked about my anonymity should take note of Marks' situation. He's a full professor, actively recruited to Baylor after a distinguished career, and he's *still* trampled on."

77. Robert Crowther, "'So, now everyone in Times Square knows about Expelled too," September 10, 2007

"Maybe Expelled's producers should rent some billboards in Waco."

78. William Dembski, "Baylor Forces Professor to Shut Down Site," September 10, 2007

"Here's the Syracuse University student paper weighing in on the Baylor Academic Freedom Crisis one wonders when the Baylor student paper, The Lariat, is going to have something to say about this."

79. Nicole Loring, "Baylor forces professor to shut down site," The Daily Orange, September 10, 2007

    "Just before the 2007-2008 academic year began, Baylor University shut down a personal Web site, dedicated to the theory of intelligent design, of distinguished professor Robert J. Marks II.

    "A Baptist university in Texas, Baylor is now entrenched in a legal battle with the electrical and chemical engineering professor, who claims his academic freedom was violated when his Web site was shut down without his knowledge.

    "The site in question, Evolutionary Informatics, cites its mission as 'investigating how information makes evolution possible.' The site featured links to Marks' personal publications and presentations on intelligent design.

    "Attorney John Gilmore, who is representing Marks, said it all began when the professor gave a podcast interview with the Discovery Institute, a renowned pro-intelligent design organization that often attracts attention for its stance on evolution.

    " 'As a result of this interview, people called and complained. A week later, it was removed," Gilmore said of the Web site."

80. Claire St. Amant, "New intelligent design conflict hits BU," Baylor Lariat, September 11, 2007

    "Baylor has received the national spotlight once again for another controversy involving intelligent design research. Dr. Robert Marks, distinguished professor of electrical and computer engineering, posted what university officials are calling "unapproved research" on his personal Web site hosted by Baylor's server. The research, which concerns informatic computing and the evolutionary process, was conducted as part of Marks' Evolutionary Informatics Lab. Baylor shut down the site in early August, shortly before a scheduled meeting to discuss the issue with Marks; his attorney, John Gilmore; Baylor General Counsel Charles Beckenhauer; Provost Dr. Randall O'Brien; and dean of engineering Benjamin Kelley – whom Gilmore credited with shutting down the site. President John Lilley did not attend.

    " '(Kelley) did not give my client the benefit of a meeting or a phone call,' Gilmore said.'

    "Barry said when publishing research on Baylor Web sites, professors can either have the backing of their department, school or dean, or decide to work independently of the university and identify it as such. Marks was working independently of the university.

    "Gilmore said he thinks other faculty Web sites without disclaimers are left alone because of their content and Marks is being discriminated against because his site deals with intelligent design.

"Despite university representatives' dismissal of this claim, many are calling the incident an infringement of academic freedom and discrimination against intelligent design.

"The Baptist Press quoted former Baylor professor William Dembski, a research professor in philosophy at Southwestern Baptist Theological Seminary, as saying this is 'perhaps the biggest story yet of academic suppression relating to ID.' "

" 'We offered to put the disclaimer that is used at the (Association of American University Professors) Web site,' Gilmore said. "That doesn't seem to be enough for Baylor.' "

Luskin said he would like to see this issue resolved by allowing Marks to post his research with a disclaimer on the Baylor server.

" 'Baylor should let Dr. Marks have the academic freedom to do research and talk about it on his Web site without any undue constraints,' he said. "It isn't that complicated.' "

81. William Dembski, "Only 'Approved Research' on our site! And who gives approval?" Uncommon Descent, 11 September 2007

"The Baylor University student newspaper, the Lariat, finally has a piece about the academic discrimination case involving Prof. Robert Marks and his Evolutionary Informatics Lab (EIL). The story introduces an interesting new twist: now the problem with the EIL site is that it doesn't contain 'approved research.' And who is supposed to approve Prof. Marks's research? His dean, Benjamin Kelley, who has admitted that he doesn't understand it? And by what criteria does or doesn't such research get approved? How about this criterion: If it's about intelligent design and promises to lower the university's prestige and undercut departmental funding, it does not constitute 'approved research.' The Baylor administration seems to have no clue what a can of worms they are opening here. In effect, they no longer have a research university."

82. Denyse O'Leary, "So where ARE the Friends of Robert Marks? Of intellectual freedom at Baylor?" Uncommon Descent, September 11, 2007

"The latest Baylor explanation of why Prof. Robert Marks' evolutionary informatics website was taken down is that he wasn't doing 'approved research.'

"There is no precedent for this notion of 'approved research' at Baylor which is most likely why the Baylor administration did not cite it earlier. They have just thought the idea up and are taking it out for a spin.

"This is the latest in a variety of explanations. The original one turned on anonymous complaints. Another cited proprietary 'Baylor branding.' Till now, none cited a doctrine of 'approval.'

> "Actually, if the Baylor administration were being honest, only one good explanation would be necessary. The story wouldn't keep changing.
>
> "The 'approved research' slogan may have resulted from careful thought among the Baylor PR staff. It's pretty good because most of us know what we would DISapprove. (Porn, racism, medical quackery, et cetera.) So Prof. Marks becomes associated with distasteful stuff.
>
> "And, all is well, right?
>
> "No, it isn't."
>
> "What the Baylorites are saying when they mutter to the media about 'approved' research is that, had they known what Marks was doing, they would not have approved. They would have found a way to stop him. That's all."

83. Gil Dodgen, "Baylor, Marks, Faust, and Selling One's Soul," Uncommon Descent, Uncommon Descent, September 11, 2007

> "There is an ancient legend about a man named Faust, who sold his soul for temporal selfish gain and self-aggrandizement. Although the immediate but ephemeral rewards were intoxicating, the ultimate consequences were hideous.
>
> "The legend of Faust has inspired much art, music, and theater over the centuries. The reason is obvious: There is a fundamental truth and lesson to be learned.
>
> In the Marks case, Baylor has sold its soul for temporal selfish gain and self-aggrandizement the antithesis of what its Baptist tradition teaches."

84. Robert Crowther "Where's Sharon Begley When We Need Her?" Evolution News & Views, September 12, 2007

> "Returning to Newsweek after a five year stint as a science writer for the Wall Street Journal, Sharon Begley posted a blog piece yesterday about Darwinist biology professor Richard Colling. Colling teaches at a small Nazarene university in Illinois and, according to Begley, has come under fire by church leaders because he is a theistic evolutionist and authored a book called Random Designer.
>
> > "Anger over his work had been building for two years. When classes resumed in late August, things finally came to a head. Colling is prohibited from teaching the general biology class, a version of which he had taught since 1991, and college president John Bowling has banned professors from assigning his book."
>
> "Two years? Robert Marks' evolutionary informatics website was barely online two months when Baylor admins gave it the heave-ho. Granted, private religious institutionsunlike state universitieshave the right to enforce doctrinal beliefs as part of their First Amendment freedom. Of course, if Colling's universitylike Baylor Universityhas claimed that it guarantees academic freedom, then that is another matter. If Colling's academic freedom has been

hindered then that needs to be corrected. We support academic freedom, obviously, for Darwinists as well as Darwinist-skeptics."

"The cases of academic persecution against Darwinists are few and far between can you name even three? whereas IDers unfortunately find themselves attacked from all sides, and all too often. Sternberg, Leonard, Wells, Bryson, Crocker, DeHart, Kenyon, Behe, Marks, and the list goes on and on and on."

85. Cody Cobb, "Let academic freedom ring," Baylor Lariat, Sept. 13, 2007

"Dr. Robert Marks should be free to pursue his research on intelligent design, and I say that as an ardent opponent of intelligent design.

"As long as Baylor doesn't front the bill and Marks puts up a disclaimer on his site, academic freedom should be reason enough to let the Web site remain on Baylor's servers."

86. Steve F, "Evolutionary Informatics lab," Internet Infidels, September 14, 2007

"There's been a bit of a kerfuffle recently about the Evolutionary Informatics lab "

87. Eric Rasmusen "The Robert Marks Academic Freedom Case at Baylor," Eric Rasmusen's Weblog, September 14th, 2007

"Baylor University is clearly infringing on academic freedom when it tries to shut down Professor Robert Marks's pro-intelligent-design website, located here with the disclaimers the professor put on in response to Baylor's complaints that people might think Baylor officially approved of his research. I wish there were more publicity about this kind of thing."

88. William Dembski, "The Baylor Board of Regents," Uncommon Descent, 14 September 2007

"President John Lilley of Baylor appears to have made up his mind that Prof. Robert Marks's Evolutionary Informatics Lab has no place at Baylor. There is only one court of appeal now, the Baylor Board of Regents, who can reverse Lilley's decision and even remove Lilley as president. Here is the list of board members. I encourage readers of UD to contact them (respectfully) and share their concerns about this gross violation of academic freedom."

89. "EIL Grows Again," Professor Smith's Weblog, September 14, 2007

90. Paul, "Can Intelligent Design and Academic Freedom Co-exist?" WeekInScience.com, 2007-09-14

91. O'Leary, "Baylor closes ranks, defends Darwin against all lines of evidence," Uncommon Descent, 14 September 2007

"Baylor's move to shut down Prof. Robert Marks's exposure of Darwinism as the Enron of biology is a harder line than the institution took seven years ago.

"Curiously, the 2000 report on the Polanyi Center (long closed) had actually proclaimed,

> " the committee wishes to make it clear that it considers research on the logical structure of mathematical arguments for intelligent design to have a legitimate claim to a place in current discussions of the relations of religion and the sciences."

"Presumably, Baylor honchos don't think that any more.

"Is that because Bob Marks can actually do it now?

"Bill Dembski tells me that the shutdown committee had never suggested that he couldn't put such papers on his own site."

92. "Editorial: BU opens old wounds with Marks," Baylor Lariat, Sept. 14, 2007[Newspaper Layout]

"The problem began when Dr. Robert Marks, distinguished professor of computer and electrical engineering, posted research relating to intelligent design on his personal Web site hosted by Baylor's server.

"Marks had no disclaimer on his site disassociating the research from that conducted under Baylor approval, so university officials shut down the site and then met with Marks to discuss the terms under which the site would go back up.

"It still hasn't gone back up, and conspiracy theories are flying about infringement of academic freedom and administrative hypocrisy.

"It would be nice to get to the bottom of this."

"Marks is a distinguished professor pursuing research in his field, and he deserves not only academic freedom, but also the common courtesy of honest and open communication. The Baylor administration has only further exacerbated the situation by not being straightforward about why they don't want to be affiliated with Marks' research in the first place.

"Baylor administrators are free to regulate their stamp of approval on Web sites, but if they plan to do so, they should follow this policy across the board."

93. "I.D. rift hits Baylor again," Answers In Genesis, September 15, 2007

"We're saddened to report on a recent administrative action at Baylor University (a Baptist school) in Texas, where administrators ordered a professors personal website be shut down because of 'anonymous concerns' that the site supported ideas associated with the intelligent design movement (IDM).

"Baylor's record on dealing with academic freedom, particularly as it concerns intelligent design the IDM, is now all the more odious. In 2000, Baylor

removed intelligent design theorist William Dembski, now at Southwestern Baptist Theological Seminary, because Dembski refused to rescind a statement supporting Intelligent Design as a legitimate form of academic inquiry.

"The professor under fire this time is Robert Marks, distinguished professor of electrical and computer engineering, who launched a website called the 'Evolutionary Informatics Lab' in June to study whether natural selection can use chance mutations to generate new information. Marks's conclusions, as explained on the website, placed limits on the scope of Darwinism and offered scientific support for Intelligent Design, explains Baptist Press.

"The debate, surprisingly, does not concern the validity of Marks's research, but rather Baylor's policies and procedures of approving centers, institutes, products using the university's name,according to Lori Fogleman, director of media communications at Baylor. In July, after giving an interview to the IDM-promoting Discovery Institute, Marks was asked by Baylor engineering school dean to remove the website. In response, Marks requested a meeting for discussion, but just shy of a week before the scheduled meeting, all references to the Evolutionary Informatics Lab on Marks website were forcibly removed."

"There are several points to take away from this sad news. First is the obviousthat even many Christian schools (some effectively Christian in name only) have become founts of Darwinism. Second, all too well known is that despite evolutionists' cries that virtually all scientists agree wholeheartedly with Darwinism, such cries are untrustworthy when academicians are afraid to speak out with their criticisms because of the harsh consequences associated with those that do. Even questioning Darwinism, let alone actually voicing support for the intelligent design movement or true biblical creation, can doom one's reputation a priori in science fields. Despite this fact, hundreds of scientists have signed an official statement dissenting from Darwinism, in addition to the many scientists who go beyond accepting the tenets of the intelligent design movement and accept, specifically, the Bible's account of creation."

"But ultimately, the saddest lesson to learn from this story is the attitude many including, apparently, some Christian academia are not even willing to fairly consider the creation/evolution issue. Apparently, Baylor's leadership is so frightened of standing against secular dogma that in dealing with Marks, it did not even consider the validity of the ID research presented."

94. Mark Bergin, "Not so fast. Baylor's treatment of an ID-advancing research lab has shifted from friendly to fire," World Magazine, September 15, 2007

"Last month, as John Gilmore flew home from Waco, Texas, after apparently resolving a dispute at Baylor University over a faculty member's website supporting intelligent design, the Minnesota attorney sipped a glass of wine, looked out the window, and wondered to himself, "Was this too easy?" Turns out, it was. On Aug. 9, Baylor officials had agreed that distinguished

engineering professor Robert Marks could repost his evolutionary informatics website on the Baptist school's server spaceif a disclaimer made clear that any research advancing intelligent design does not represent an institutional position. Less than two weeks later, Gilmore received an email from Baylor general counsel Charles Beckenhauer detailing considerable further alterations Marks needed to make before reposting his site.

"Among the demands:

- ◇ Delete the title "The Evolutionary Informatics Lab" from the top of every page.
- ◇ Delete the name and email address of a Baylor graduate student assisting Marks with his research.
- ◇ Post at the bottom of every page and the top of the home page a 108-word public-relations statement denying any institutional support for the research and extolling Baylor's commitment to academic freedom.

Finding such demands excessive, Gilmore replied to Beckenhauer reminding him of the Aug. 9 meeting in which Baylor Provost Randall O'Brien and Dean Ben Kelley of the School of Engineering and Computer Science had accepted a far simpler arrangement: 'I believe you have overreached here in order to pacify those at Baylorand outside of Baylorwho complained to Dean Kelley and who most certainly won't be pleased that the website will go back up in any form.' "

95. "UD Invites Readers to Write to the Board of Regents at Baylor" September 16th, 2007

96. Beth Mull, "Baylor University: Stifling Academic Freedom?" ICR, September 16th, 2007

"Baylor University is wrangling once again with the issue of Intelligent Design. The affiliate of the Baptist General Convention of Texas is reported to have shut down a professor's personal website because of anonymous complaints that the site could be construed as supporting Intelligent Design as a field of scientific inquiry."

"An interview with Dr. Marks appeared in July on the pro-Intelligent Design website of the Discovery Institute, and a week later the Dean of Engineering at Baylor, Benjamin Kelley, reportedly told Dr. Marks to remove his website."

"In an August 9th meeting between concerned parties, Baylor officials requested that Dr. Marks add a disclaimer to his website to clarify that it was not affiliated with the university. Provost Randall O'Brien reportedly indicated that The Evolutionary Informatics Lab site could resume operation, but less than two weeks later Baylor attorney Charles Beckenhauer contacted Dr. Marks' lawyer with additional "fixes" to the site, leading to speculation that university president John Lilley was overriding his provost's prior agreement."

"Discovery Institute's Casey Luskin commented, 'It is simply unconscionable that a major university would so trample a scientist's right to freedom of scientific inquiry.' The Evolutionary Informatics Lab, now cleansed of any association with Baylor, is currently being hosted outside of the university's auspices.

"Baylor's website describes the university's mission as educating men and women for leadership and service "by integrating academic excellence and Christian commitment within a caring community." How is either of those goals 'excellence or commitment' served by clinging to evolution at the cost of academic freedom? "

97. "How do evolutionary processes create information?" Panda's Thumb, September 16, 2007

98. Mark Chu-Carroll, "A Glance at the Work of Dembski and Marks," Goodmath, 9/17/07

"Both in comments, and via email, I've received numerous requests to take a look at the work of Dembski and Marks, published through Professor Marks's website."

"There's two ways of looking at this work: on a purely technical level, and in terms of its presentation.

"On a technical level, it's not bad. Not great by any stretch, but it's entirely reasonable. The idea of it is actually pretter clever. They start with NFL. NFL says, roughly, that if you don't know anything about the search space, you can't select a search that will perform better than a random walk. If we have a search for a given search space that does perform better than a random walk, in information theoretic terms, we can say that the search encodes information about the search space. How can we quantify the information encoded in a search algorithm that allows it to perform as well as it does?

"So, for example, think about a search algorithm like Newton's method. It generally homes in extremely rapidly on the roots of a polynomial equation - dramatically better than one would expect in a random walk. For example, if we look at something like y = x2 - 2, starting with an approximation of a zero at x=1, we can get to a very good approximation in just two iterations. What information is encoded in Newton's method? Among other things, it's working in a Euclidean space on a continuous, differentiable curve. That's rather a lot of information. We can actually quantify that in information theoretic terms by computing the average time to find a root in a random walk, compared to the average time to find a root in Newton's method.

"Further, when a search performs worse than what is predicted by a random walk, we can say that with respect to the particular search task, that the search encodes negative information - that it actually contains some assumptions about the locations of the target that actively push it away, and prevent it from finding the target as quickly as a random walk would."

"That's the technical meat of the paper. And I've got to say, it's not bad. I was expecting something really awful - but it's not. As I said earlier, it's far from being a great paper. But technically, it's reasonable."

"So as much as I'd love to trash them, a quick read of the paper seems to show that it's a mediocre paper, with an interesting idea. The writing sucks: it was written to try to make a point that it can't make technically, and it makes that point with all the subtlety of a sledgehammer, despite the fact that the actual technical content of the paper can't support it."

99. Regis Nicoll "The Unpardonable Sin in Academia," CrossWalk.com, Sep 17, 2007

"What do William Dembski, Frank Beckwith, and Dr. Robert J. Marks have in common? All three have been victims of academic suppression at not at Cornell, Stanford or MIT, but at Baylor Universitythe world's largest institute of higher learning in the Baptist tradition."

"...the campus thought police has Robert Marks in its crosshairs. Marks is a Distinguished Professor of Engineering at Baylor who chairs several national and international committees, has authored over 300 technical papers and three books, and has received numerous awards in the field of computational intelligence.

"This past June Dr. Marks launched a website on the Baylor server called, 'Evolutionary Informatics Lab.' The purpose of the lab was to distinguish 'the respective roles of internally generated and externally applied information in the performance of evolutionary systems.'

"Although not an ID site, per se, Evolutionary Informatics was ID-friendly containing quotes by Michael Polanyi and links to publications of ID researchers like William Dembski. That was enough for a group of anonymous complainers to pressure the administration into purging the site from the Baylor system.

In sad irony, the science building where Dr. Marks works bears the words of Paul, 'By Him all things are made; in Him all things are held together.'

Even sadder is the fact that Baylor, as a Christian-based school, is not alone As Casey Luskin of the Discovery Institute explains, 'In the academic world, if you question evolution, you come under attack. There's been a pattern of discrimination against ID all over the nation in the past couple years.' It seems that the one commandment enforced by secular and Christian schools alike is: 'Thou shalt put no other gods before Darwin.' "

100. KAREY QUARTON "INTELLIGENT WEB DESIGN," The Michigan Daily, 9/17/07

"Baylor University shut down a professor's personal website earlier this week because the page supported intelligent design. College officials said they removed the site from the school's server because the subject matter was "immaterial" and the professor did not follow proper protocol for posting research.

Access to the page was blocked before the professor could discuss the issue with school officials. The professor's lawyer has argued that his client was not given the opportunity to post a disclaimer on his website and that the University's decision to remove the website constitutes discrimination."

101. Emory U. Student Paper, The Emory Wheel Reprints Baylor LariatArticle: "Baylor U. Takes Intelligent Design Website." Tuesday, September 18, 2007

102. Walt Ruloff, Executive producer, Premise Media "BU administration silencing science by design," The Baylor Lariat, Sept. 18, 2007 [Newspaper Layout]

"It may sound like a crazy question, but it needs to be asked: Does the administration at Baylor believe in God?

"This is a legitimate question in light of the university's heavy-handed actions in shutting down the research Web site of Dr. Robert Marks."

"My team and I (including lawyer, economist, actor, game show host and social commentator Ben Stein) have interviewed dozens of the world's top experts in biology, astronomy, physics and philosophy.

"What we have uncovered in our documentary film, Expelled: No Intelligence Allowed, is an attack on freedom of speech and scientific inquiry that is as frightening as it is appalling. And it's happening right here at Baylor.

"Last month Dr. Ben Kelley, dean of engineering and computer science, shut down Marks' Web site. He apparently had the blessing of President John Lilley. Why? The university put forth a bunch of phony-baloney procedural explanations that don't stand up to scrutiny.

"The truth however, can be found in an e-mail sent to Marks by Ben Kelley in which he told Marks, 'I have received several concerned messages...' about his Web site. These complaints have been kept anonymous. How convenient.

"Here's what's going on: Somebody within the scientific community let Kelley know that Marks was running a Web site that was friendly to Intelligent Design."

103. William Dembski. "Walt Ruloff op-ed on academic suppression at Baylor 'Does the Baylor administration believe in God?', " Uncommon Descent, 19 September 2007

"Walt Ruloff, the executive producer of the Ben Stein movie EXPELLED: NO INTELLIGENCE ALLOWED, has an amazing op-ed in today's Baylor Lariat, the school newspaper. WOW!"

104. William Dembski "'Expelled: The Movie' attempts to interview Baylor President John Lilley," Uncommon Descent, 19 September 2007

"According to today's Baylor Lariat (the student newspaper), the producer of the upcoming Ben Stein documentary on suppression of ID (www.expelledthemovie.com) is sending a crew to Baylor to interview President John Lilley and others regarding the removal of Robert Marks's Evolutionary Informatics Lab from Baylor"

105. Claire St. Amant, "ID debate to continue in new film," The Baylor Lariat, Sept. 19, 2007 [Newspaper Layout]

> "Troubled by the Baylor administration's removal of an intelligent design Web site from a Baylor server, a producer from the film Expelled: No Intelligence Allowed is planning a Thursday trip to campus in hopes of meeting with President John Lilley.
>
> "Distinguished professor Dr. Robert Marks' personal research Web site on evolutionary informatics was taken down from a Baylor server last month, and producers of Expelled want to speak to Lilley about it.
>
> " 'We are disturbed with what happened with Dr. Marks," executive producer Walt Ruloff said. "He was working on some really vital research."

106. Pat Sullivan, "Intelligent Design Researcher Censored," September 19, 2007

> "Coverage of Baylor University versus Professor Robert Marks has been pretty widespread, especially on ID blogs. A website he had on the Baylor server was shut down. His website reported on his mathematics research regarding the potential limits of Darwinian theory."
>
> "When Baylor officials realized his research potentially questioned evolutionary dogma they simply shut down his website without even informing him. His academic freedom (usually considered sacred) was clearly violated. Even PZ Myers at his Pharyngula blog, a very outspoken, vitriolic critic of ID came out in support of Mark's academic freedom to study and report anything he wished. Good for PZ. (I would point to his blog but it is down right now.)
>
> "It has been argued by evolutionists that there is NO effort to stifle scientists who question Darwinity. But there are many examples, this one the most recent. The controversy has attracted the attention of Ben Stein who is working on a documentary film, Expelled: No Intelligence Allowed. The censorship at Baylor will make it in the film for sure. Dr. Mark's attorney is working on this as well.
>
> "The efforts of evolutionists to censor anything ID is backfiring. For ID scientists to draw inferences of design from their scientific observation is science. The rabid efforts of Darwinists to claim they are idiots who don't understand science simply are illogical. They use an unnatural definition of science to protect their materialistic faith. As long as they control the definition of science they can hide behind their often silly statements. Personally, I think we will continue to see the evolution monopoly unravel."

107. William Dembski "President Lilley has laryngitis," Uncommon Descent, 20 September 2007

> "Today's Baylor Lariat (the student newspaper) has an amazing editorial... 'Lilley's two cents are missing"'

108. "Lilley's two cents are missing," Baylor Lariat, Sept. 20, 2007. [Newspaper Layout]

> "...one of the most crucial roles a university president must play, especially during times of dispute, is to act as the face of the university. By virtue of his job description, Lilley is the voice of Baylor. Lately it seems he has laryngitis.
>
> "When Baylor was thrust into the national spotlight for shutting down distinguished professor Dr. Robert Marks' intelligent design Web site, representatives from media relations answered questions, not Lilley.
>
> "Of course, the public could hardly expect anything less, considering Lilley's absence from the initial meeting between Marks and a handful of Baylor administrators."
>
> "As your student body, we'd like to hear from you once in a while."

109. Ryan Latham "Baylor right in Marks debacle," Baylor Lariat, Sept. 20, 2007 - Letter to the editor [Newspaper Layout]

110. Forthekids "Baylor takes Lilley to task," Reasonable Kansans, September 20, 2007

> "Well, it looks as though Baylor is becoming a bit put off with their President. Yesterday, I posted an article from the Baylor Lariat which was written by the producer of the upcoming movie, Expelled: No Intelligence Allowed. Apparently, his film crew was on it's way to interview President Lilley in regard to the Evolutionary Informatics lab fiasco, but it looks as though he refused to meet with them."

111. Jackie Hyland, "ID talks fail to satisfy," Baylor Lariat, Sept. 21, 2007 [Newspaper Layout]

> "The associate producer of the film Expelled: No Intelligence Allowed, Mark Mathis arrived on campus Thursday morning with a camera crew in a last effort to speak to President John Lilley.
>
> "Mark Mathis wished to discuss the decision to shut down a research Web site on Intelligent Design belonging to Dr. Robert Marks, distinguished professor in the electrical and computer engineering department.
>
> "Lilley was unavailable, but Mathis met with director of media relations Lori Fogleman and Dr. Ben Kelley, dean of the school of Engineering and Computer Science."
>
> " 'With Dean Kelley and Lori Fogleman, it's pretty clear to me that both of them were coached by lawyers to continue saying it's not content but procedure," Mathis said.
>
> "Mathis said he asked Kelley and Fogleman several questions about academic freedom and the issue behind Marks' Web site, but he was unable to get a lot of answers.

" 'It seems odd to me that Baylor, which is a Christian university, is uncomfortable with a professor who is doing a research sympathetic to intelligent design,' Mathis said.

"Allentown, Pa., junior Sam Chen is the director of the Intelligent Design Undergraduate Research Center.

"He met and talked to Mathis on Thursday.

"Chen said he thought it was interesting how generic and closed the administration's speech is about this issue."

112. Tim Woods "Film crew presses Baylor officials on intelligent design Web site's removal," Waco Tribune, September 21, 2007

"Baylor University's recent controversy regarding a professor's intelligent design-related Web site took a dramatic turn Thursday when a film crew went to President John Lilley's office, hoping to speak to him about what they deem academic suppression.

"But Lilley was out of town."

"Mathis said Stein and the film's producers believe Baylor's removal of distinguished engineering professor Robert Marks' Web site devoted to evolutionary informatics a concept Marks' collaborator, William Dembski, termed 'friendly' to intelligent design from its server is an example of academic suppression. While Baylor officials have said the site was removed for procedural reasons, namely the absence of a disclaimer separating the university from involvement in Marks' research, Mathis believes it was taken down because of its content.

" 'To us, it seems pretty obvious what's going on with Professor Marks' Web site. . . . To us, that's academic persecution and suppression,' Mathis said. 'What is the problem with tenured, distinguished university professors pursuing a scientific idea? What's wrong with that? It's especially interesting in the case of Baylor, in that this is happening at a Christian university.' "

"Outside Baylor's Pat Neff Hall, which houses Lilley's and Fogleman's offices, Mathis pressed the issue of academic suppression with Fogleman.

" 'This had everything to do with the fact that (Marks' site) was friendly to intelligent design, didn't it?' Mathis asked Fogleman.

" 'I just know that right now there is a discussion between the parties . . . and it will be resolved to mutual satisfaction,' Fogleman replied.

" 'The content of the site has nothing to do with this,' Fogleman later said, again stressing Baylor's stance that it is a procedural matter.

"Mathis then asked Fogleman about whether or not she is allowed to openly refer to intelligent design. 'You will not say intelligent design.' Is that forbidden? You keep saying content.' . . . You haven't said (intelligent design) and it stuck out to me,' Mathis said. 'You guys are holding your cards so tight . . . Are you not allowed to say it?'

"Fogleman responded, 'I am allowed to say it, (but) I'm not saying it because you're asking me to.' "

113. William Dembski, "MEDIA COVERAGE: Baylor, Robert Marks, and the EvoInfo Lab," Uncommon Descent, 21 September 2007

"September 14th marked the end of the first wave of media attention in the Baylor administration's censoring of Prof. Robert Marks's Evolutionary Informatics Lab (now on a third-party server at www.EvoInfo.org). With the coming to campus of a crew from Ben Stein for his forthcoming movie/documentary EXPELLED: NO INTELLIGENCE ALLOWED, things have ramped up and the second wave has begun (see all the local newspaper coverage cited below).

"Where are we now? Baylor President John Lilley remains the problem he continues to dig in his heels and won't let the Evolutionary Informatics Lab back on campus. Nonetheless, the people speaking to the press in his stead (e.g., Lori Fogleman and Randall O'Brien) are now back to claiming that the problem was 'procedural' (previously they had introduced the category of 'approved research' research in evolutionary informatics presumably constituting unapproved research). Also, they are saying that there is a 'deal in the works' (see the front-page story in the Waco Tribune, 9.21.07, link given below).

"How there can be a deal in the works when the administration has made clear that Prof. Marks's work on evolutionary informatics is entirely on his own time and may not be characterized as a group or lab on the Baylor server remains a mystery. Baylor is positioning itself as a 'reasonable party' trying to work things out, but in fact they are simply playing a waiting game until this second wave of media interest dies down, after which the removal of Prof. Marks's website from the Baylor server will be quietly forgotten. What the Baylor administration needs to do is apologize to Prof. Marks and restore his site with no more restrictions than any one else on the Baylor server faces."

114. William Dembski "Baylor President John Lilley Responds," Uncommon Descent, 21 September 2007

"Peter Irons, it appears, has been corresponding with President Lilley of Baylor, writing him on Wednesday, September 19, 2007 to alert him about the crew of EXPELLED that was coming to campus (Irons continually forwards me emails):

> "Also, the Discovery Institute, of which Dembski is a Fellow, has announced on its website that a producer of a still-in-production film called 'Expelled' will visit your campus tomorrow (Thursday) with a request to interview you for this film. Pretending to be an 'objective' account of the evolution/intelligent design controversy on

various campuses, the film is in fact a highly biased project, devoted to showing the 'persecution' of intelligent design advocates. I'm sure you will not agree to meet with Walt Ruloff, the film's producer, but I did want to warn you in advance about his deceptive intentions. Mr. Ruloff, by the way, convinced the Baylor Lariat editors to run an opinion piece by him in which he questioned whether Baylor faculty and administrators believe in God. Can you believe this?"

"Irons forwarded me President Lilley's reply:

"Subject: RE: Professor Dembski's attacks on you
From: "Lilley, John M."
Date: Wed, September 19, 2007 5:34 pm
To: pironsATweber.ucsd.edu
Peter, thanks for your email. It is greatly appreciated. I shall not take the bait on the movie. I greatly regret the difficulty that Dembski has created. John "

"I contacted President Lilley (also copying the provost and others at Baylor) about whether these actually are his words:

"Date: Thu, 20 Sep 2007 11:29:06 -0500
To: John_LilleyATbaylor.edu, pironsATweber.ucsd.edu
From: "William A. Dembski"
Subject: Fwd: RE: Professor Dembski's attacks on you
Cc: Randall_O'BrienATbaylor.edu, Ben_KelleyATbaylor.edu,

Dear President Lilley,
Peter Irons, a professor at one of the University of California campuses, continually forwards to me email communications, ostensibly between him and others. He's forwarded to me several putative emails from you. I'd like to confirm whether the exchange below is genuine before I blog on it.
If it is genuine, I would point out that any difficulties you may be experiencing over your suppression of ID-related research at Baylor are of your own creation. My role in this has merely been to shine some light.
Best wishes,
Bill Dembski"

"Twenty-four hours later still no disconfirmation from Baylor that Lilley wrote what Irons forwarded to me."

115. Robert Crowther, "Baylor President Stays Mum on University's Suppression of Intelligent Design," Evolution News & Views, September 21, 2007

"The Baylor student newspaper continues to report on the story of the shut down of distinguished professor Robert Marks' evolutionary informatics website due to aonymous complaints that it was pro-intelligent design. Baylor

president John Lilley refused to speak with Expelled filmmakers about the suppression of intelligent design scientists and scholars. Filmmakers had to settle speaking to a public relations reprsentative and the Dean of Marks' school."

' "With both of them it was really limited because they have a certain line they are holding, which the issues are all about procedures and not about the content,' Mathis said, 'and all the information we have seen says that that's not true.' "

' "With Dean Kelley and Lori Fogleman, it's pretty clear to me that both of them were coached by lawyers to continue saying it's not content but procedure,' Mathis said."

116. "Thou Shalt Put No Other Gods Before Darwin," Vital Signs Blog, September 21, 2007

117. Gil Dodgen, "Real Simulations, Cartoon Simulations, and Evolutionary Informatics," Uncommon Descent, 22 September 2007

"Computer programs that purport to validate the grand claims of Darwinian (i.e., chance and necessity) biological evolution are a hoot."

"Interestingly, investigating the validity of evolutionary simulations is one of the things Marks and Dembski have been doing with their evolutionary informatics research. In the case of an evolutionary program called ev, they demonstrated that all but 8.8 bits of information out of a total of 131 were smuggled into the program, and then it was squandered with an evolutionary algorithm. It turns out that random queries outperform the evolutionary algorithm by over 10,000 . I believe Dembski and Marks have plans to conduct a similar analysis of Avida.

"Avida and ev are cartoon simulations.

"Of course, this is what got Marks in trouble at Baylor. There is no need to investigate the validity of evolutionary simulations, because we know in advance that Darwinian mechanisms explain everything in biology."

118. Gary Ramsey "Call it censorship at Baylor," Waco Tribune, September 24, 2007

"Robert Marks' Web site was hosted on Baylor servers (as professors are permitted to use). However, after someone objected, Baylor took Marks' Web page down.

"This was in direct violation of an agreement hammered out just days before that included Marks changing the title of the material and featuring a disclaimer that it represented his views only and not Baylor's.

"This censorship is based not on poor scholarship or bad data but on a disagreement about the research's conclusions.

"The conclusions were not deemed to be particularly favorable to the notion that Darwin was right and no intelligence was required in the creation of the world and everything in it.

"A Baylor spokesman said that taking the page down has nothing to do with content and everything to do with rules relating to Baylor's official endorsement of ideas. Right.

"That Baylor would be so unbold as to cower before those who advocate a secular society must give its supporters pause."

119. Gary Ramsey, guest column: "Call it censorship at Baylor," The Waco Tribune, September 24, 2007

"Baylor University literally has censored a 'distinguished instructor' who has been conducting computational studies of what Darwinian evolution can and cannot accomplish.

"Robert Marks' Web site was hosted on Baylor servers (as professors are permitted to use). However, after someone objected, Baylor took Marks' Web page down.

"This was in direct violation of an agreement hammered out just days before that included Marks changing the title of the material and featuring a disclaimer that it represented his views only and not Baylor's. This censorship is based not on poor scholarship or bad data but on a disagreement about the research's conclusions.

"The conclusions were not deemed to be particularly favorable to the notion that Darwin was right and no intelligence was required in the creation of the world and everything in it."

"A Baylor spokesman said that taking the page down has nothing to do with content and everything to do with rules relating to Baylor's official endorsement of ideas. Right."

120. Robert Crowther, "Op-ed in Waco Paper Highlights Baylor Univeristy Censorship of Intelligent Design Website," Evolution News & Views, September 24, 2007

"The Waco Tribune Herald today published an op-ed, keeping the spotlight on Baylor University's crusade to stifle research questioning Darwinism or supporting intelligent design.

"Aside from the fact that they got both the author and the professor's name wrong (Mark Ramsey is the author, Robert Marks is the professor), the op-ed continues to showcase the censorship used by the Baylor administration to suppress intelligent design."

121. "Creationist Mini-Museum to Come to Wisconsin Dells," Globe Lens, September 24, 2007

"As Wisconsin Dells Events reported, private collector Bill Mielke hopes to establish an artifact display in the Dells area showing humans and dinosaurs were contemporaries"

"Meanwhile, everyone else seems to be talking about the Robert Marks fiasco at Baylor... Although Baylor president John Lilley may have finally made

a peep, he can't hide for long now that Baylor's own student newspaper is criticizing him and his faculty"

122. O'Leary, "Why Bob Marks's lab got trashed," Uncommon Descent, 25 September 2007

> "Here's what I think of the whole mess (and I am not an American and do not live anywhere near Waco or Baylor and have nothing but trouble to expect from either side in this matter.):
>
> "The Voices of the Baylor Bears have figured out one thing for sure: Bob Marks knows precisely what is rotten in the state of Darwinism.
>
> "So a vast army rushes to aid Baylor's quest to be the Protestant Notorious Dame, or whatever it wants to be (forgive me if I forget).
>
> "The Bears can't afford to have their obsequious little Baptist university expose the Darwin mess. Then they will not get the rewards handed out to all those who keep their traps shut tight.
>
> "Traps must be shut tight in a world dominated by materialism, where Top People actually believe in that ol' Darwinian magic.
>
> "Oh, you know, mud to mind and all that, in a zillion easy steps. Or maybe a zillion zillion easy steps, or ... heck, what's another few powers of ten ... bring em on ..."

123. Anika Smith, "Troubling Signs at Baylor University," ID the Future, September 25, 2007

> "On this episode of ID the Future, Anika Smith takes a look at an emerging pattern of academic suppression and viewpoint discrimination at Baylor University. Baylor's recent removal of distinguished professor Robert Marks' website is only the most recent example of this trend, which spans from college campuses to government institutions and beyond."

124. Raymond Takashi Swenson, "Baylor betraying its mission," Baylor Lariat (Studet Newsapaper) Sept. 25, 2007. [Newspaper Layout]

> "I am amazed that a university purporting to be connected to a church is so scared about the idea of intelligent design that they feel they must suppress its discussion.
>
> "Even more, does Baylor suppress all original speculation about scientific questions and only allow publication of scientific ideas that are widely endorsed as 'orthodox'?
>
> "If so, then it is guaranteeing that it will never be a first-rate research institution, because the really groundbreaking original insights are by definition outside the mainstream."

125. Raymond Marc Carrier, "Marks can publish findings," Baylor Lariat (Studet Newsapaper) Sept. 25, 2007. [Paper Layout]

"When and if Marks ever does viably challenge Darwin, he will surely publish his findings. Or are all peer-reviewed scientific journals run by atheists?"

126. Raymond Mark Moore, "Bible is proven scientifically," Baylor Lariat (Studet Newsapaper) Sept. 25, 2007. [Paper Layout]

"This is a country where we allow different opinions. If there is another side of the argument, let's hear it. Don't be offended by another side, respect the other side just like religions, countries, etc. respect each other."

127. Robert Crowther, "New York Times' Cornelia Dean: Wrong on Evolution, Intelligent Design and Expelled," Evolution News & Views, September 27, 2007

"The New York Times periodically exhibits a questionable nose for news. What rises to the level of news for the science writers at the Times aren't instances of scientific censorship or persecution of scientists. Today, complaints by Darwinists allegedly featured in a forthcoming (and as of yet unfinished, according to the filmmakers themselves) film, Expelled, that documents the persecution of scientists who question Darwin, is considered news by the Times' science staff.

"What about real news related to the debate over evolution and intelligent design? The Times has a snobbishly selective olfactory sense, it seems.

"Has the Times reported on the attacks on the academic freedom of distinguished professor Robert Marks, who had his research website on intelligent design shut down by Baylor University?"

128. TBC Staff, "BAYLOR UNIVERSITY," The Berean Call, September 28, 2007.

"We're saddened to report on a recent administrative action at Baylor University (a Baptist school) in Texas, where administrators ordered a professor's personal website be shut down because of "anonymous concerns" that the site supported ideas associated with the intelligent design movement (IDM).

"Baylor's record on dealing with academic freedom, particularly as it concerns intelligent design the IDM, is now all the more odious."

129. "Baylor University," The Berean Call, September 28, 2007

"We're saddened to report on a recent administrative action at Baylor University (a Baptist school) in Texas, where administrators ordered a professor's personal website be shut down because of 'anonymous concerns' that the site supported ideas associated with the intelligent design movement (IDM)."

"The debate, surprisingly, does not concern the validity of Marks' research, but rather 'Baylor's policies and procedures of approving centers, institutes, products using the university's name,' according to Lori Fogleman, director of media communications at Baylor. In July, after giving an interview to

the IDM-promoting Discovery Institute, Marks was asked by Baylor's engineering school dean to remove the website. In response, Marks requested a meeting for discussion, but just shy of a week before the scheduled meeting, all references to the Evolutionary Informatics Lab on Marks' website were forcibly removed."

"Should we be surprised? Dembski, the previous victim, offers a fairly chilling perspective on academic freedom when it comes to disagreement with Darwin:

" 'You have to understand, in the current academic climate, Intelligent Design is like leprosy or heresy in times past. To be tagged as an ID supporter is to become an academic pariah, and this holds even at so-called Christian institutions that place a premium on respectability at the expense of truth and the offense of the Gospel.' "

130. Regis Nicoll "From Galileo to Robert J. Marks," BreakPoint 9/28/2007

"'It's simply unconscionable that a major university would so trample a scientist's right to freedom of scientific inquiry.' (Casey Luskin, attorney)

"Dr. Robert J. Marks is a distinguished professor of engineering at Baylor who chairs several national and international committees, has authored over 300 technical papers and three books, and has received numerous awards in the field of computational intelligence."

"This past June Dr. Marks launched a website on the Baylor server called 'Evolutionary Informatics Lab.' The purpose of the lab was to distinguish 'the respective roles of internally generated and externally applied information in the performance of evolutionary systems.' "

"In sad irony, the science building where Dr. Marks works bears the words of Paul, 'By Him all things are made; in Him all things are held together."'

131. World Net Daily on "Expelled: No Intelligence Allowed," Uncommon Descent, September 29, 2007

132. Mark Ramsey, "Et Tu, Baylor U?," TexasInsider.org October 1, 2007

"Baylor University has made tremendous strides in the past several years in working toward the vision of 'Baylor 2012'. In the beginning of the first 'Imperative' of Baylor 2012, a vision of critical thinking is stated.

" 'Baylor will seek to maintain a culture that fosters a conversation about great ideas and the issues that confront humanity and how a Christian worldview interprets and affects them both.'

"While Baylor has made progress towards many 2012 goals, it just took a giant leap backward on this keystone concept, which has academic freedom for students and faculty as its foundation.

"Baylor has literally censored a 'distinguished instructor' who has been conducting computational studies of what Darwinian evolution can and cannot

accomplish. His website was hosted on Baylor servers (as professors are permitted to use). However, some still mysterious (and anonymous) person or persons objected to the content of his website.

"Baylor's administration literally took one of his web pages down."

"Is Baylor Consistent?"

"The geology department's statement on evolution is instructive. It includes numerous pages, several in direct conflict with clear teaching of most Baylor parents' and students' beliefs."

"Authorities listed as 'suggested reading' include Stephen J. Gould (the most vocal atheist in America until his death), Richard Dawkins (the most vocal living atheist on the planet who openly mocks all religion and whose 'weasel' computer program is a joke compared to Professor Marks' work), and Eugenie Scott, director of the National Center for Science Education, a so-called think-tank devoted (and partially publicly funded) to promoting evolution and discrediting non-evolutionary beliefs."

"Some 'conversation'."

"Professor Marks, Baylor students and faculty, and yes, Baptists, deserve better."

133. Bruce Chapman, "Who is Anti-Science?" Family Action Organization, October 1, 2007

"Today, the persecutors of scientific dissidents are not in the Church, but in the academy. At Baylor University, an intelligent design project that is not even directly funded by grants, has its website shut down by the university."

134. Casey Luskin, "Credibility Gap: Baylor Denies Robert Marks' Situation Has Anything to do with Intelligent Design," Evolution News & Views, October 1, 2007

"The Waco Tribune reported that 'Baylor vice president for marketing and communications John Barry denied that the matter has been drawn out because the content is related to intelligent design.' Does Baylor University actually expect us to believe that this has nothing to do with ID? William Dembski reports that the initial e-mail sent from Baylor administrator, Dean Kelley, to Dr. Marks explicitly stated that people were complaining about Robert Marks's website precisely because it dealt with ID:

> "I have received several concerned messages this week about an interview and web site dealing with evolutionary computing associated ID. Please disconnect this web site immediately and Cheryl will arrange a time for us to meet immediately upon my return."

"It was this e-mail that preluded Baylor's removal of Marks's website without his knowledge or permission.

"Baylor, of course, provides the usual pretexts that they are treating Dr. Marks like they would any other faculty. This makes it important to dispel

Baylor's pretexts for persecuting Dr. Marks on the grounds that he has done something wrong.

"Dr. Marks is an innocent party. He was simply doing his own research, much like any other faculty might do, and he discussed it on a website. After Dr. Marks made the mistake of talking about his research on an ID the Future Podcast, some anti-ID forces at Baylor complained, and Baylor administrators sent Dr. Marks the threatening e-mail above and even took the website offline, without Marks' permission and knowledge."

135. Editorial: "Lilley, Lariat striving for effectiveness," Baylor Lariat, Oct. 2, 2007 [Newspaper Layout]

"The editorial board met Thursday with President John Lilley, his chief of staff Karla Leeper and vice president of media relations John Barry. This meeting came on the heels of our editorial, 'Lilley's two cents are missing,' which called for administrative transparency, more direct access to the president and direct responses to important, university wide issues."

"In the case of Dr. Robert Marks, we were assured by Barry that allegations that Lilley was somehow involved in shutting down the Web site are 'categorically false.' "

136. Editorial: "Free to speak, free to read," Waco Tribune, October 03, 2007

"Baylor librarians are participating in Banned Books Week by scheduling readings from select books that have been purged from library shelves due to public or governmental pressure.

"These include such classics as To Kill a Mockingbird, Of Mice and Men and Lord of the Rings. Of current note is Alms for Jihad: Charity & Terrorism in the Islamic World. A lawsuit caused Cambridge Press to recall all copies of Alms in bookstores and ask that libraries remove it. To its credit, Baylor's library system refused. It is one of the books from which excerpts will be read aloud this week."

"Right now Baylor has a controversy over a professor's Web site about intelligent design. The university pulled it down over concerns that it conveyed Baylor's endorsement of the concept. The professor says that a mutually acceptable disclaimer was composed to address the concerns, but Baylor still won't allow the site."

"Crushing unpopular opinions and censoring information might be the impulse of a tyrannical majority. But the right of the individual to think, read and speak freely is the bedrock of this society. After all, it was formed so many years ago by people who fled oppression.

"Read on."

137. (KSLR) "Baylor University, to their shame, has censored the web pages of a professor who discussed "Intelligent Design" as the explanation for our origin instead of Darwinian evolution. Attorney John Gilmore joins me" October 3, 2007.

138. O'Leary "Banned Books Week - at least one dinosaur survived after all," Uncommon descent, 3 October 2007

> "Friends draw my attention to this Banned Books Week event at Baylor, and this hasty reassurance that we are NOT supposed to think that there is any clear comparison between the suppression of Bob Marks's evolutionary informatics lab and the banning of books. (Hat tip Anarchicharmony's William J. Murray.)"

139. "Speaking of 'Expelled,' a Scientist is Censored," LIFEETHICS.ORG, October 4, 2007

> "Last month Dr. Ben Kelley, dean of engineering and computer science, shut down Marks' Web site. He apparently had the blessing of President John Lilley. Why? The university put forth a bunch of phony-baloney procedural explanations that don't stand up to scrutiny."
>
> "The truth however, can be found in an e-mail sent to Marks by Ben Kelley in which he told Marks, 'I have received several concerned messages...' about his Web site. These complaints have been kept anonymous. How convenient."

140. Aaron, "Free speech? Not for you because you're wrong," October 4, 2007

> "Imagine your a college professor with a website where you post information about your research. Should your website and information be protected only if the college agrees with it? Should controversial research be banned from the professor's webpage? If you're Robert Marks and you are working for Baylor and in the intelligent design related field of evolutionary informatics."
>
> "This is not about whether you agree with ID or not. Thils is about whether you accept academic freedom or not."

141. Dangoldfinch. "Turns out there were other similar episodes by Baylor University," October 4, 2007

> "It seems that even historically Christian' universities are not above fear. Seems that even Baylor University is getting in on the action against professor Bob Marks."
>
> "There's also the story of Guillermo Gonzalez who was denied tenure at Iowa State University"

142. Bob Unruh, "Darwin challenged, research censored. Christian university removes professor's website, data from public view," World Net Daily. October 4, 2007

> "A professor whose research could be the foundation for a major challenge to Darwin's theory of evolution and his historically Christian employer are at odds over that work, with Baylor University ordering Professor Bob Marks' work taken off the Internet."
>
> "Prof. Marks told WND he could not comment since his lawyer and the university are in negotiations over the situation. And Baylor spokeswoman

Lori Fogleman said there are 'ongoing legal discussions that we hope will be resolved to both party's mutual satisfaction.' However, she told WND she was unaware of a single other instance in which any research posting by any Baylor professor had been treated in a similar fashion."

143. 071005 (BLOG) Jim Lange, "The Inmates Running the Asylum," October 5, 2007

"A professor at a Christian university (Baylor University) has been forced to remove his research from the internet which challenges Darwin's theory of evolution and helps to further prove the existence of God's design."

"My first reaction to this is that this is like the inmates running the asylum. How can this university operate out of a position of fear like this?"

144. Michael F. Haverluck "Christian University Sides with Evolutionists," CBNNews.com (Christian Broadcasting Network, October 5, 2007

"Despite its Christian background, Baylor University demanded that Professor Bob Marks take his Web site off the Internet because scientific findings posted there challenged Darwinian evolution.

"It is believed that Baylor has succumbed to the bullying of evolutionists who have dominated the field of science in American academic institutions."

" 'As many of you have heard, Marks, a distinguished professor of electrical and computer engineering, has been conducting research that ultimately may challenge the foundation of Darwinian theory,' said Walt Ruloff, the executive producer of Premise Media. 'In layman's terms, Marks is using highly sophisticated mathematical and computational techniques to determine if there are limits to what natural selection can do,' Ruloff explained. 'At Baylor, a Christian institution, this should be pretty unremarkable stuff. I'm assuming most of the faculty, students and alumni believe in God, so wouldn't it also be safe to assume you have no problem with a professor trying to scientifically quantify the limits of a blind,

undirected cause of the origin and subsequent history of life?" '

145. John Hugh Gilmore, "Mob rule, not academic freedom, at Baylor," Waco Tribune-Herald, October 7, 2007... [Unedited]

"To the opponents, intelligent design ID is an intellectual crime. Or so we must assume by the actions of Baylor University.

"As counsel for Baylor Distinguished Professor Robert J. Marks II, I was amazed and discouraged by the controversy surrounding his rather routine yet scientifically exacting Web site that was shut down by the dean of his Engineering Department. This action came after anonymous complaints, but without an opportunity for him to respond beforehand."

146. William J. Murray "Darwin as sacred cow," WacoTrib.org October 8, 2007

> "Baylor University's ... Marks is a world-class expert in evolutionary computing. His Web site that Baylor unceremoniously pulled had nothing to do with 'intelligent design.' Rather, it was the faceplate for his evolutionary informatics lab, where he was attempting to run realistic simulations to see if RM&NS [random mutation and natural selection] could actually account for what neo-Darwinists claim."

147. "Lawsuit claims job tied to faith in natural selection: Researcher sues over dismissal because he didn't 'believe'," World Net Daily, December 8, 2007

> "A former researcher for the prestigious Woods Hole Oceanographic Institution is suing the institution, alleging he was dismissed from his position there because he didn't have faith in evolution."
>
> "WND reported earlier the issue had driven a wedge between Baylor University Professor Bob Marks, whose research could be the foundation for a major challenge to Darwinian faith, and his historically Christian employer.
>
> "Walt Ruloff, the executive producer of Premise Media, who worked with actor Ben Stein on a new project called 'Expelled: No Intelligence Allowed,' about the monopoly Darwinian beliefs hold in academia, wrote in the Baylor student newspaper about his concerns."

148. Pat Sullivan, "The Baylor ID vs Evolution Controversy," The Pat Sullivan Blog, October 9, 2007

> "Here is a very good article from the Waco Tribune regarding Dr. Robert Marks. Baylor took down his website because he dared to espouse some of the scientific merits of Intelligent Design based on hi s own research. Baylor University clearly violated the academic freedom of Dr. Marks, persecuting him for questioning Darwinian evolutionary dogma. The fact that this Texas Inquisition has gone on so long is rather amazing to me. It would seem that Baylor would realize how silly it's actions are. It calls widespread attention to the McCarthy-like approach of the Darwinists. It shows Darwinists to be religionists of the worst type."

149. Denyse O'Leary, "When you want the approval of people whose approval you should NOT want..." Uncommon Descent, October 9, 2007

> "On Sunday, Bob Marks's lawyer John Hugh Gilmore wrote an op-ed in the Waco Tribune expressing astonishment at the sheer, manifest vulgarity of the attempt to suppress the Evolutionary Informatics Lab"

150. "Intellectual Insecurity at Baylor" Darwinian Fundamentalism, October 9, 2007

> "It would appear that my comments about the apparent intellectual insecurity at Iowa State (also here) would apply to Baylor as well. And it looks like this intellectual insecurity will get a lot more attention soon, and will really put Baylor on the map"

151. Robert J. Marks II, "Review: EXPELLED: NO INTELLIGENCE ALLOWED," Christian News New Zealand, December 12, 2007

> "I attended a screening of EXPELLED: NO INTELLIGENCE ALLOWED yesterday in Dallas. ... we watched the movie with unwavering interest. Wow. I want everybody to see this important film. I now know where I will do my Christmas shopping.
>
> "John Sullivan, one of the movie's producers, said EXPELLED will open on about a thousand screens in February. This is about the same number of screens for Michael Moore's last documentary.There is sooooo much great stuff in this movie. Here are some bullets."
>
> "Old B&W movie clips were sprinkled throughout the film. One showed a 1950's middle school bully (Big Science) sitting on the stomach of a victim (ID proponent) pinning his arms back. The bully boy keeps saying 'OK. Now you're on our side. Say you're on our side!' It was hilarious.
>
> "There are also a bunch of short custom animated cartoons. One is an animation of Richard Dawkins frustrated at the low probabilities emanating from a bank of slot machines. The audience roared."

152. Rusty Pugh "Attorney accuses Baylor Univ. of viewpoint discrimination," OneNewsNow.com, October 12, 2007

> "An attorney representing a Baylor University professor whose website was shut down because it promoted intelligent design says the Baptist school is guilty of viewpoint discrimination."
>
> "just before the school year began, Baylor shut down the website, claiming Marks had violated university procedure for hosting websites. Attorney John Gilmore, however, says it had nothing to do with procedures – he claims Baylor did not like the professor's intelligent design stance. He is accusing the university of viewpoint discrimination.
>
> " 'No other website that we're aware of has been shut down at Baylor,' says the attorney. 'The dean of his engineering department, who is a good man – but [who] I think had pressure brought to bear on him – shut down his website without any investigation, without any discussion with my client."'

153. Robert Crowther "Lucky for Koonin, he doesn't teach at Baylor," Evolution News & Views, October 12, 2007

> "Like Koonin, Michael Behe in his latest book *The Edge of Evolution* shows what evolution can do and what it can't. Professor Robert Marks at Baylor uses the Evolutionary Bioinformatics Lab to showcase some of the limits of Darwinian evolution. Both have suffered serious repercussions. But not Koonin (yet)."

154. Minggu, "Menggoyang Teori Evolusi, Situs Internet Profesor Dibrangus," Hidayatullah.com October 21, 2007

> "Hidayatullah.com–Sebuah perguruan tinggi Kristen Baptist di Texas Amerika Serikat, Universitas Baylor, telah melakukan penindasan terhadap kebebasan akademis stafnya, Robert Marks, seorang profesor teknik elektro dan komputer. Kedzaliman ini dilakukan dengan menutup situs internet milik Roberts Marks yang berisi penelitian yang dikerjakannya. Menurut media pemberitaan di Universitas itu, Lariat, 11 September 2007, penelitian di laboratorium Informatika Evolusi yang dikelola profesor Marks mencakup komputasi informatik dan proses evolusi[11]"

155. Salvador "$40,000 tuition and salary" ExpelledTheMovie.com, October 31, 2007

> "In the Spring and Summer of 2007, Dr. Robert Marks of Baylor University offered me 2 years tuition and a small salary to work as his research assistant in the Evolutionary Informatics Lab."
>
> "The Informatics Lab was shut down in August by the Darwinists at Baylor when it was evident the scientific research would put certain Darwinist organizations around the country out of business and into disrepute. With the lab shutting down, so went my offer."

156. Intelligent Design Watcher: Kumicit's Blog "Comments on Active Information." November 13, 2007

> "In a recent draft manuscript, Dembski and his coauthor Marks extend the vocabulary with three new terms [1]: endogenous information, exogenous information, and active information."

157. John West, "New Report Exposes Sham of Academic Freedom at Baylor University" Evolution News & Views, November 16, 2017

> "Today's edition of the student newspaper at Baylor University carries a devastating investigative report exposing new details of the university's shameful treatment of pro-ID engineering professor Robert Marks. Anyone who thinks Baylor science faculty have academic freedom to research and write about ID should read this article, which provides extensive documentation of the lengths to which some Baylor administrators will go to censor and shut down open discussion and research about intelligent design."

158. Denyse O'Leary, "Baylor Lariat asks for vote on intelligent design" Uncommon Descent, November 16, 2007

159. Brad Briggs and Grace Maalouf, "BU had role in Dembski return" November 16, 2007... [Newspaper Layout]

[11] Translation of Indonesian: A Baptist Christian College in Texas United States, Baylor University, has been suppressing the academic freedom of his staff, Robert Marks, a professor of engineering electro and computer. This tyranny is done by closing Roberts Marks's internet site contains the research he did. According to news media at the University, Lariat, 11 September 2007, research in the Evolutionary Informatics lab managed by professor Marks includes computing informatics and evolutionary processes.

"Baylor's history of controversy surrounding intelligent design has been well chronicled, especially when former professor Dr. William Dembski has been involved. But such was not the case in November of 2006 when Dembski arrived back on campus to work with Dr. Robert Marks, distinguished professor of computer and electrical engineering.

"Baylor was involved in asking for the grant that brought Dembski back, but when his return was made known to the administration, Baylor returned the grant, effectively terminating his position."

160. 071127 Baylor Lariat Editorial: Disclosure lacking in ID dispute, November 27, 2007 [Newspaper Layout]

"The controversy around intelligent design research came into focus when Dr. Robert Marks, distinguished professor of computer science and engineering, procured a private grant to hire a researcher. His research assistant was Dr. William Dembski, who once ran Baylor's controversial Polanyi Center, which addressed science and religion."

161. World Net Daily,Lawsuit claims job tied to faith in natural selection: Researcher sues over dismissal because he didn't 'believe', December 8, 2007

"'As many of you have heard, Marks, a distinguished professor of electrical and computer engineering, has been conducting research that ultimately may challenge the foundation of Darwinian theory. In layman's terms, Marks is using highly sophisticated mathematical and computational techniques to determine if there are limits to what natural selection can do,' he wrote. 'At Baylor, a Christian institution, this should be pretty unremarkable stuff. I'm assuming most of the faculty, students and alumni believe in God, so wouldn't it also be safe to assume you have no problem with a professor trying to scientifically quantify the limits of a blind, undirected cause of the origin and subsequent history of life?

" 'But the dirty little secret is university administrators are much more fearful of the Darwinian Machine than they are of you,' he said.

"Here's what's going on: Somebody within the scientific community let [Baylor dean Ben] Kelley know that Marks was running a website that was friendly to intelligent design. Such a thing is completely unacceptable in today's university system even at a Christian institution. Kelley was probably told to have the site shut down immediately or suffer the consequences,' Ruloff said.

"Prof. Marks told WND he could not comment since his lawyer and the university are in negotiations over the situation. And Baylor spokeswoman Lori Fogleman said there are 'ongoing legal discussions that we hope will be resolved to both party's mutual satisfaction.' "

162. Top 10 Darwin and Design News Stories for 2007, December 29, 2007

> "5. Academic Persecution Continues. Last year Richard Sternberg lost his job at the Smithsonian for 'allowing' a pro-intelligent design paper to be published. This year noted astronomer Guillermo Gonzalez was denied tenure at Iowa State University because of his intelligent design affiliations and the Baylor University administration shut down Robert Marks's Evolutionary Informatics Lab and website for similar reasons. These three tragic stories and others will be exposed in the Ben Stein documentary Expelled: No Intelligence Allowed to appear in theaters nationwide next spring."

2008

163. Robert Crowther, "Access Research Network Announces Top 10 Darwin and Design News Stories of 2007," Evolution News & Views, January 2, 2008

> "Even though scientists should be free to follow the evidence wherever it leads, the 2007 stories about Guillermo Gonzales being denied tenure at Iowa State and Robert Marks having his lab and website shutdown at Baylor University prove that we are not as free as we would like to think."

164. Jocelyn Green "ID Tagged; Faculty member at Iowa State University denied tenure for supporting intelligent design," Christianity Today, Jan 10, 2008

> "When Guillermo Gonzalez, assistant professor of physics and astronomy, was denied tenure at Iowa State University (ISU) in November 2006, department head Eli Rosenberg said the decision had nothing to do with Gonzalez's support of intelligent design. Recently released documents, however, told a different story."
>
> "In August 2007, Baylor University took offline the Evolutionary Informatics Lab website of Robert Marks, who is tenured. He said it was because the lab's research implied there might be a Creator. 'What's at issue here is the ability to bring the idea of the possibility of design into science,' said Marks."

165. Jerry Pierce "Baptist professors featured in new film," Southern Baptist TEXAN, January 28, 2008

> "DALLASTwo professors with ties to Baptist higher education are featured in an upcoming big-screen documentary that aims to expose the scientific establishment's scorn toward academics who question Darwinian evolution.
>
> " 'Expelled: No Intelligence Allowed' is scheduled for theaters in April and stars comedic actor and conservative activist Ben Stein as he travels the world interviewing intelligent design (ID) proponents whose careers have been threatened, as well as prominent neo-Darwinists who hold ID in contempt, including Richard Dawkins, author of the best-selling book 'The God Delusion.'

A rough cut of the film, screened Jan. 10 in Dallas, featured interviews with William Dembski, a research professor of philosophy at Southwestern Baptist Theological Seminary and a leading ID proponent whose books include 'The Design Inference' and 'No Free Lunch,' and Robert Marks, who holds the title of 'distinguished professor of engineering' at Baylor University."

"Marks appears in the film as one of the 'expelled' academics. Although he remains at Baylor as a tenured professor, Baylor officials last year forced Marks to return grant money it received related to ID research and forced his ID research website to an off-campus server.

"Marks appears in the movie with Stein near the Brazos River in Waco. Stein interviewed Marks' engineering dean, Ben Kelley, on film, but attempts to interview Baylor President John Lilley and other administration officials failed.

"Marks said of the film: 'I sat there and I laughed. I laughed because I have seen this atheistic, big-science mafia squad come out and kill the careers of many of my friends. Guillermo Gonzalez, who I knew at the University of Washington. Richard von Sternberg, who I recently met. And to see their motivation and goals so clearly exposed in a Ben Stein sort of dry humor was incredible. I really, really enjoyed the movie. I think it is going to have an enormous impact. I hope it does.' "

166. Jerry Pierce "Q&A: Expelled' producer Logan Craft" Southern Baptist TEXAN, January 28, 2008

"TEXAN: I understand that William Dembski, formerly at Baylor, is in this film, as well as Robert Marks of Baylor. What was your reaction when you discovered the resistance to intelligent design research at places like Baylor or SMU?

"CRAFT: That's no surprise. To me, the long history of religiously founded universities and colleges in the United States is typically one of the ultimate capturing of the colleges and universities by the progressive secularists. I think you see that at Baylor partly. You see that at SMU almost entirely."

167. Jerry Pierce, "Q&A: 'Expelled's' Robert Marks," Southern Baptist TEXAN, January 28, 2008

"The Southern Baptist TEXAN's Jerry Pierce interviewed Robert Marks, a distinguished professor of engineering at Baylor University, regarding his role in the upcoming movie documentary 'Expelled,' starring Ben Stein. Last summer Marks' research website related to intelligent design (ID) drew enough criticism at the Baptist school that he was forced to move the site to an independent web server, remove Baylor's name from the research and also return private grant money donated to Baylor on Marks' behalf. Prior to his coming to Baylor in 2003, Marks served on the faculty of the University of Washington in Seattle for 26 years. The following is excerpted from the interview.

TEXAN: First off, what is your faith background?
MARKS: I have been a follower of Jesus Christ since I was a junior in college. While at the University of Washington I was the Campus Crusade for Christ advisor for 18 years. I knew Walter Bradley, another distinguished professor of engineering at Baylor, an incredible man and one of the heroes in my life. I had heard him speak on the topic of the scientific evidence for the existence of God. I was up for moving on to an endowed chair in Colorado. Baylor was attempting through their 2012 Initiative to be the first institution that pursued research and celebrates a Christian worldview. I heard about that and I decided that was one thing I wanted to dedicate the rest of my career to. For that reason we came down to Baylor in 2003.
TEXAN: Why is there a conflict over ID at a self-identifying Christian school such as Baylor?
MARKS: Baylor had a reputation as an excellent teaching university that wanted to jumpstart its research programs. I have my name on about five books and about 300 academic publications. They wanted that reputation. But I realized after I came here that Baylor, with its goals, was attempting to do things that are contradictory and they needed to make decisions. One, they want to be recognized by the world as a critical research institution, and number two, they want to celebrate a Christian worldview. Well, as Christians we are told not to seek the approval of the world. And so as I see it, Baylor is going to come to a place where they will have to make the decision on one side or the otherto be acceptable to the world or to pursue a Christian worldview. So that, I believe, is one of the things that is motivating what is happening right now. There is a two-sphere model of education that says you have science, and you have your faith, and the two shouldn't intersect. You have a quote by the current president (William Underwood) that says the Bible is not a book about science. I claim that saying the Bible is not a book about science is like saying a cookbook is not a book about chemistry. Now, it doesn't address chemistry, but boy, there's a lot of chemistry in a cookbook. And the other thing about the two-sphere modelit is the only mode of Christianity that is acceptable to atheists. So if your goal as a Christian is to be compatible with the world, your only choice is the two-sphere model. I also believe that any pursuance of truth requires consideration of a creator. And many people try to define science to exclude the possibility of a creator. And if you do that it isn't a pursuance of truth any more.
TEXAN: When did you first realize there might be a conflict between your work in ID and the academic priorities at Baylor?
MARKS: I first thought it was a dislike of Williams Dembski [a leading ID proponent formerly at Baylor and now at Southwestern Seminary]. William Dembski is a polarizing name at Baylor. I

actually received a grant from a private organization, a Microsoft millionaire, and the purpose was to bring on Bill Dembski so I could see him a couple of days a week and actually have him in an office here to do some collaboration. Boy, [the Baylor administration] didn't like that. They sent back the money for it. And at the time, I thought it was William Dembski. And later on, when they shut down my website and with other comments that were made, there was no doubtit was indeed intelligent design. There isand this is the topic explored in 'Expelled'there is a Darwinian, atheistic mafia whose purpose is to ruin the careers of anybody who delves into the idea of intelligent design. And we had kept it stealth from them that Bill was involved. Now to be clear, at Baylor it wasn't stealth, as was suggested in a student newspaper article here. It was totally open at Baylor. I had the proposal. Bill Dembski's name was on the proposal. It is amusing that the previous provost actually blamed me for the president signing something [the research grant proposal] he didn't read. We tried other avenues for grant money. The National Science Foundation said it did not fit the direction they were looking for. The Templeton Foundation turned it down as well.
TEXAN: Where does the research stand?
MARKS: The research is ongoing and I'm really excited about it. We do have some papers under consideration for publication in journals. The basic idea of what Bill Dembski and I are working on in evolutionary informatics is, simply put, evolution is modeled as an assembly line where complexity pumps out of the end. And it took a lot of smarts to assemble that assembly line. We've been working on measuring the information that would be required for that. And it's still going on. Through my background, a lot of people say, Boy, this Robert Marks, he's doing things in biology. He has no reason to do anything in biology because he's an engineer.' Well, it turns out engineers have been doing evolutionary computing to design things for years. I've been involved in this area in simulation of evolution.
TEXAN: What's the result so far, in layman's terms?
MARKS: The universe as accepted by science in terms of size and age is not big enough or old enough to explain evolution. There just do not exist the probabilistic resourcesthe idea that evolution has a chance. People in ID have been saying this for a long time, but we're actually able to measure the information that is required and do it in bitsjust like the same bits that we use in a DVD player, measuring that information content in bitsand the results are astonishing. We have some papers that are being peer reviewed for journals. I did recognize that Bill was a name that was polarizing, so when we submitted these papers we submitted them without Bill's name on them. I don't know if this current publicity that I've gotten because of the Baylor situation is now going to hurt in the peer-review as-

pects. Currently, we want to do the research. I have actually tried to begin a draft of a book trying to explain the results of our research without the mathematics. I'm an engineer; it's hard for me to write a page without putting an equation on it. Bill, of course, is genius at doing that. He's one of the most talented men I've ever met. But he has the ability to write at a wonderful lay level without getting into all the details. I think that's a ways off, however, because we have a lot of other things to do before that. TEXAN: Where do the negotiations with you, your attorney, and the Baylor administration stand right now?
MARKS: I believe the negotiations as of recently have just reached an impasse. I have moved the evolutionary informatics site onto a third-party server and it's still there. Currently, it's at evoinfo.org, and it includes the paper that was done. Then we've also added other affiliates from other universities who are also helping us with our work.
TEXAN: Have you screened the movie yet?
MARKS: Yes, I have. I sat there and I laughed. I laughed because I have seen this atheistic, big-science mafia squad come out and kill the careers of many of my friends. Guillermo Gonzalez, whom I knew at the University of Washington. Richard Von Sternberg, whom I recently met. And to see their motivation and their goals so clearly exposed in a Ben Stein sort of dry humor was incredible. I really, really enjoyed the movie. I think it is going to have an enormous impact. I hope it does. The producers talked to me prior to the Baylor incident because they knew of my work with Bill Dembski. Then when the website was removed they came to Baylor and attempted to interview the president and a bunch of other people about this. They got some interesting quotes. Although they didn't get to interview the president, they did interview my dean, Ben Kelley. If you'll notice, big science is trying to squash the talking about God in academia. People say ID is religion dressed up in a cheap tuxedo. Well, big science is atheism dressed up in a cheap tuxedo. Their motivation when you scratch the surface is so unreal in terms of propagating their atheism. Richard Dawkins and P.Z. Myers [noted atheistic evolutionists], they are chilling in what they are trying to do.

168. William Dembski, "EXPELLED in Baptist Press," Uncommon Descent, 3 February 2008

169. "INTELLIGENT DESIGN COSTS PROF HIS JOB: Regents reject tenure request without evidence, testimony," WORLD NET DAILY EXCLUSIVE, 02/07/2008

> "Iowa State University regents, who earlier ruled against accepting evidence or hearing testimony from a professor in a dispute over the school's denial

of his tenure, now have turned down his appeal."

"According to Robert J. Marks, distinguished professor of electrical and computer engineering at Baylor, he checked a citation index of journal papers, and found one of Gonzalez' research papers had 153 citations listed; another had 139.

" 'I have sat on oodles of tenure committees at both a large private university and a state research university, chaired the university tenure committee, and have seen more tenure cases than the Pope has Cardinals,' he said. 'This is a LOT of citations for an assistant professor up for tenure.' "

170. Tyler DiPietro "The Horowitz Option," February 8, 2008

171. Sam Hodges, "Dembski, Marks featured in 'ID' film," Baptist Press, 6 February 2008

172. JUAN SANCHEZ, "Baptist Professors Dembski and Marks to be Featured in Ben Stein's Expelled," STRAIGHT TO THE HEART, FEBRUARY 9, 2008

173. Andrew Halloway, "Expelled: New movie exposes persecution of anti-Darwinists," Creation Ministries, 15 February 2008

174. David Klinghoffer "EVOLUTION'S GLASS CEILING," Townhall Magazine, February 26, 2008

"Experienced scientists who support intelligent design theories literally have to disguise themselves in order to perform their research."

" 'There are so many bodies by the side of the road that people get the message,' said Robert Marks, who teaches engineering and computational intelligence at Baylor University. One of his research interests is simulating evolution on computers. Without additional information (a/k/a design) being included in the simulation, he finds, the evolutionary process doesn't produce results as Darwin promised.

"Dr. Marks has tenure and was lured away from the University of Washington in 2003, in an attempt by Baylor to upgrade its academic image. His latest book will be published by Oxford University Press. You might think he'd feel secure. Yet when I asked to interview him, he agreed only on the condition that his attorney listens.

"At Baylor, Marks said, he has suffered 'viewpoint discrimination, violation of academic freedom, persecution.' In 2006, Baylor canceled a $30,000 grant Dr. Marks had received, which was intended to let him hire a famous ID theorist, mathematician William Dembski, to assist him. In 2007, the university disconnected a website Marks had put together about 'evolutionary informatics,' featuring ID-related work done by Dr. Dembski and himself."

175. Barbara F. Hollingsworth "America's new blacklist," National Examiner, 2008-03-06. [PDF]

> "A new documentary-style film, 'Expelled: No Intelligence Allowed,' starring Ben Stein, scheduled for release in early April, examines the blacklisting now happening on today's college campuses."
>
> "One can understand, if not condone, persecution of academics who bring up ID on secular campuses. But even though ID would seem to mesh well with Christian colleges' religious world-view, they are no haven for expelled academics. Baylor mathematics professor Robert Marx [sic] explains in the film how he was ordered by his dean to take down an ID-related Web site."

176. George Noory, "Interview with Expelled's producer Mark Mathis," Coast to Coast, August 3, 2008. [Audio #1] [Audio #2]

177. "Expelled! Comments from Southern Baptist Texan Wednesday," Alabaxterblog's Weblog, Mar 12 2008

> "'Expelled' exposes the blacklisting of academics who question the prevailing Darwinian dogma." "The original inspiration came specifically in this subject matter to Walt Ruloff [Expelled co-producer], who is a Canadian. He lives in Vancouver. I used to live in Vancouver, where I studied under a theologian named J.I. Packer at Regent, and Walt and I became acquainted.
>
> "Walt was a very successful technology entrepreneur, founder of a software company. And he was doing some business in Houston and he picked up a 'Wired' magazine in the Houston Intercontinental Airport lounge and he read an article about this debate between evolution and intelligent design. He had always been interested in the subject matter and he got inspired and kind of had an epiphany on the flight back to Canada, and he wrote out a treatment on a screenplay.
>
> "And that very beginning, a sort of inspirational moment for Walt, turned into a partnership between John, Walt and myself to explore controversial subject matter related to science and to science and religion. I had been working in New Mexico. I produced and hosted a regionally televised program called 'Church and State with Logan Craft.' And 'Church and State' explored a lot of the controversial social issues and political issues that both religious and non-religious people were interested in. So when Walt and John brought this to me, I was interested because I had been covering a panoply of issues over the years and was very, very aware of the connection between the landmark issues in the culture war and the debate over evolution. So we formed a partnership in 2005, developed the company in 2006 and began filming and acquiring raw material footage in the middle of 2006."
>
> "Marx and Freud have already been contracted, and I think Darwin is on his way to being contracted. And I think that's a good thing."

178. "Expelled! No Intelligence Allowed - now scheduled for April Wednesday, " Alabaxterblog's Weblog, Mar 12 2008

179. "Expelled: New movie exposes persecution of anti-Darwinists," Alabaxterblog's Weblog, Mar 12 2008

> "'Expelled' has received endorsements from evangelical Christian leaders such as J.I. Packer, Chuck Colson and James Dobson. Craft said Premise Media would be screening the film for some Southern Baptists leaders in Houston and Louisville, Ky., soon."

180. Rush Limbaugh, "Ben Stein's Film Blew Rush Away," The Rush Limbaugh Show, March 18 2008. [Audio]

> "Ben Stein has a new movie out. He brought it by my house Friday afternoon to screen it for me. It's called Expelled. It is powerful. It is fabulous. And here's the premise of his movie. The premise is that Darwinism has taken root, taken hold at every major intellectual institution around the world in Western Society, from Great Britain to the United States, you name it. Darwinism, of course, does not permit for the existence of a supreme being, a higher power, or a God. His interviews with some of the professors who espouse Darwinism are literally shocking. The condescension and the arrogance these people have, they will readily admit that Darwinism and evolution do not explain how life began. One of these professors said it might have been that a hyper-intelligence from another planet came here and started our race. This from some professor either in the UK, I forget where it was, but can't be God. These people are so threatened by the existence of God, they will not permit intelligent design to be discussed. Professors have been fired, blackballed, and prevented from working who have deigned to try to combine the whole concept of evolution with intelligent design.
>
> "Ben Stein's new movie is going to open to a thousand screens pretty soon, it's not out there yet. It's called Expelled. But the point of it is that these people on the left are just scared to death of God. It threatens everything. We, on the other hand, recognize that our greatness, who we are, our potential, our ambition, our desire, comes from God, and as part of our Creation, this natural yearning to be free and to practice liberty. That is how we think this country came to be great. It is how we think this country will continue to be great and to grow."

181. Bob's Bloggersection, "Dealing with Design (from Montgomery's Journey)," TUESDAY, MARCH 25, 2008

182. O'Leary, "Baylor going gently into that good night?," Uncommon Descent, March 31, 2008.

> "A Christian research university would be a great contribution. But the temptation to sell out to tax-funded materialism is everywhere.
>
> "Who is surprised when yet another institution is pitching headfirst? Read The Dying of the Light for a scholar's take on the subject."

183. Review of Expelled on *Marketplace*. [Audio]

184. Benjamin Hawkins "Dembski: 'Expelled' exposes hypocrisy," Baptist Press, Apr 4, 2008.

> "A controversial documentary set for release nationwide April 18 could foster a cultural shift 'equivalent to the fall of the Berlin Wall,' says William Dembski, research professor of philosophy at Southwestern Baptist Theological Seminary."
>
> " 'This film exposes the hypocrisy of an academic and cultural elite who pretend that they value freedom of inquiry and expression but in fact suppress it when it clashes with their deeply held materialistic convictions,' Dembski said. He and other proponents of ID have suggested that the universe shows signs of having been designed by an intelligent being."
>
> Unlike biblical creationism, ID does not begin with the Genesis account of creation, nor do its proponents attempt to describe the nature of the intelligence that designed the universe. Despite this fact, Dembski noted, 'ID is friendly to Christian theism in a way that materialistic forms of evolution never have been.'
>
> " 'One of the biggest obstacles to people coming to Christ in Western culture is the impression that science has disproved the Bible and Christianity,' he said. 'ID therefore helps to correct this false impression by showing that our best science supports belief in a higher intelligence responsible for life. ID does not give you the Christian God as such, but it puts you in the right ballpark.' "

185. O'Leary "Expelled: 'Denormalizing' the Darwin thugs," Uncommon Descent, April 5, 2008.

> "If I had heard the word 'denormalizing' from a sociology prof, instead of from Ezra Levant, the courageous Canadian lawyer who is working to bring down Canada's unspeakable 'human rights commissions', I would just groan.
>
> "But, 'denormalizing' is a useful term for the Expelled film's potential impact in the United States."
>
> "Expelled is a 100-minute eye-opener. But once your eyes are opened, you are responsible for what you see."

186. Mark Bergin, "A campus divided - ACADEMIA: Baylor promotes Christian scholarship while dismissing Christian scholars," World Magazine, April 5, 2008.

187. O'Leary "Expelled: 'Denormalizing' the accountability gap at Baylor - 3," Uncommon Descent, 8 April 2008

> "If students are distracted by an emphasis on how Christianity is allegedly compatible with Darwinism, they are unlikely to evaluate Darwin's theory on the scanty evidence.

> "And their confusion protects them. After all, Baylor is the university that shut down the Web site of a distinguished professor for skeptically investigating evolutionary computing programs. (By the way, so much for teaching students to 'think for themselves.' What good did thinking for himself do Prof. Marks?)"

188. Carl E. Olson "ID vs. "Big Science" On The Big Screen: An Interview with Mark Mathis, Associate Producer of Expelled," Ignatius Insight, April 5, 2008.

> "Ignatius Insight: Are there any secular universities at which there are exceptions to this [attitude against Darwinism]?
>
> "Mathis: Not only are there not any secular universities that are an exception to this, there are very few Christian universities that are an exception to this. One of the men featured in Expelled is from Baylor University, Robert J. Marks. As soon as the head of his department discovered that Dr. Marks had a research program up on the web that pointed toward intelligent design theory in its conclusionsthis is in the fields of mathematics and engineeringhe was told to shut it down immediately. When Professor Marks didn't, the university shut it down for him."

189. O'Leary "Expelled - and Baylor's passion for Darwin - 4," Uncommon Descent, 11 April 2008

190. Christian Ohnimus, "Expelled," That Green Gentleman, SATURDAY, APRIL 12, 2008.

191. John West, " on The NCSE Exposed: Clunky Attack on 'Expelled' Reveals More Than Intended," Evolution News & Views, April 15, 2008

> "The National Center for Science Education has just unveiled its expanded website denouncing the upcoming movie 'Expelled,' but the website's clunky attacks merely provide confirmation that the film's essential thesis is correct: Darwinists really don't believe in academic freedom regarding evolution, and they're more than willing to smear any scientist who disagrees with them.
>
> "The basic thrust of the NCSE's website seems to be the preposterous claim that pro-ID scientists never, ever face harassment, intimidation, or persecution. Not ever! Scientists who claim otherwisesuch as biologist Richard Sternberg, astronomer Guillermo Gonzalez, and Baylor University engineering professor Robert Marksmust be cry-babies or worse."
>
> "The NCSE similarly does its best to cover up the facts about what happened to Baylor University engineering professor Robert Marks, making it appear that the only consequence he faced was the loss of a research website. The NCSE neglects to mention Baylor also forced Marks to return a grant he had received for intelligent design-related research (after the university had duly accepted the grant). The return of the grant meant that Marks was deprived

of funding for a post-doc position for pro-ID mathematician William Dembski. The NCSE also neglects to mention that university officials pressured Marks to stop pursuing his intelligent design-inspired research."

192. Doc Noebel, President, Summit Ministries "Expelled, the Movie: Academic Freedom in Jeopardy" Summit Ministries, April 15, 2008

    "Most of us take academic freedom for granted. We assume that freedom of speech applies not only to the political and social arena but also to the halls of education. However, the foundations of freedom are experiencing seismic tremors in the academy. In the area of science education the freedom to pursue the truth where ever it leads is experiencing a major setback. It is the equivalent of a modern-day black-list!"

    "Early screenings of the film have uncovered supporters of its message such as Missouri Governor Matt Blunt and radio personality Rush Limbaugh. Marvin Olasky, Editor of World Magazine, wrote in a recent article, "'Expelled,' is perfect for adults and children of middle-school age or above: It should be rated R not for sex or violence but for being reasonable, radical, risible, and right"

193. Robert Crowther, "Expelled World Premiere," Evolution News & Science, APRIL 17, 2008.

    "Last night in Dallas the official theater run of Expelled was kicked off with a gala premiere complete with red carpet, film narrator Ben Stein, and the film's main stars, the Expelled scientists. Here's a few pictures."

194. Carl Hoover, "Baylor officials among those demonized in 'Expelled'," Waco Tribune, April 19, 2008

    "Ben Stein's Expelled: No Intelligence Allowed ostensibly looks at academic freedom, or the alleged lack thereof, at schools and universities, including Baylor University, on the issue of intelligent design."

195. Lori Fogleman "Baylor Senior Awarded Prestigious Goldwater Scholarship," Baylor News, April 18, 2008.

    "'Juan Yaquian is a rare intellectual jewel of a student,' said Dr. Robert Marks, Distinguished Professor of Engineering at Baylor and one of Yaquian's mentors. 'His soft-spokenness and humility are wonderful attributes often not characteristic of such genius. He has shown that, given a chance, great things can be accomplished by those from humble backgrounds. Remember the name Juan Yaquian. He is going to accomplish great things for society and our Lord.' "

196. Premier of *Expelled: No Intelligence Allowed*. April 18, 2008

    - Movie: *Expelled: No Intelligence Allowed*

- ◇ "Bad to the Bone" Trailer
- ◇ 7 Minute Trailer
- ◇ "It's Awesome" Trailer[12]
- ◇ Ben Stein interviewed by Bill O'Reilly
- ◇ Ben Stein interviewed by Hannity & Combes
- ◇ Glenn Beck interviews Ben Stein. [Video #1], [Video #2], [Video #3], [Video #4], [Video #5].

197. Denyse O'Leary "Artificial intelligence: A look at things that neither we nor computers can discover," Mindful Hack, April 20, 2008

> "Recently (April 15, 2008), Robert J. Marks II, Distinguished Professor of Electrical & Computer Engineering at Baylor University in Texas, addressed a joint meeting of the local American Scientific Affiliation and the Baylor Society for Conversations in Religion, Ethics and Science, on the limitations of computer models of life and mind:
>
> > "Computing has no theory of everything (T.O.E.). We're uncertain whether physics has a T.O.E. as revealed in M-theory but, due to the genius of Kurt Gödel 75 years ago, smart people like Stephen Hawking are starting to doubt it.
> > "This is because of a new startling mathematical idea from algorithmic information theory (AIT): There exist things that are true that cannot be derived from fundamental principles. Some things are true simply because they are true.
> > "Many claim God cannot be proved. (Although I'll show you G"odel's short mathematical proof of God's existence). There are some things we know exist that we can prove we will never know.
> > "Most doubt a computer program will ever write a deeply meaningful poem or a classic novel. How about something simpler? Can we look at an arbitrary computer program and decide whether or not it will ever print out the number 3?
> > "We can for some programs. But Alan Turing, the founder of computer science, proved it is impossible to write a program to analyze another arbitrary program to tell us whether or not a 3 will be printed.
> > "In fact, we can't write a computer program to determine anything another arbitrary computer program will do. (This is called Rice's theorem.) To find out, we need to run the program.
> > "We can also prove there are numbers of finite precision numbers a computer can't compute. One of these is Chaitin's number, an astonishing constant between zero and one we know exists.

[12] Contains footage of Robert J. Marks

> "If we knew Chaitin's constant to finite precision - one single number - we could solve many open problems in mathematics. These include the Riemann hypothesis, Goldbach's conjecture and whether or not there is an odd perfect number.
> "Chaitin's constant exists, but we can prove we will never know it. These and other mind bending properties in the field of AIT [artificial intelligence theory] seem too far fetched to be true, but with a minimum of math, I will convince you otherwise."

"Sounds interesting. I have written to ask him how it turned out."

198. John P. Meyer, "Review: 'Expelled: No Intelligence Allowed'bites down hard," KVAL.com, Apr 20, 2008. [pdf]

> "How does one go about commenting objectively on a film like Expelled: No Intelligence Allowed?"

199. Lynn Ngo and Shannon Daily, " 'Expelled' encourages intelligent design discussion, Chen says," The Baylor Lariat, April 22, 2008. [Newspaper Layout]

> "Friday marked the nation-wide opening of the movie Expelled: No Intelligence Allowed."
>
> "Several Baylor professors, including Dr. Robert Marks and Dr. Walter Bradley, both distinguished professors in the engineering and computer science department, were interviewed for the film.
>
> "Marks and Bradley were among the opening night crowd at the Hollywood Theaters.
>
> " 'I thought it portrayed things pretty well as they are that science by decree of entrenched Darwinism has no room for a God hypothesis,' Marks said. 'I on the other hand think that one cannot pursue truth without consideration of a creator.'
>
> "Marks said if science defines science as void of a creator, then it's not a pursuit of truth.
>
> "Bradley said in an e-mail to The Baylor Lariat there were areas he would have liked to see explored in more detail.
>
> " 'The general thesis that belief in an intelligently designed universe can prevent people from being hired or cause them to lose their job is sadly true in many universities, maybe even in some departments at Baylor,' Bradley said."

200. Stephen Jablonski, "Obviously not objective, 'Expelled' explores academic freedom," The Baylor Lariat, April 22, 2008. [Newspaper Layout]

> "If you attend Baylor University, you need to see this movie.
>
> "But first, do a quick research of the following names: William A. Dembski, the Michael Polyani Center, Robert Marks II, Robert Sloan... In fact, brush up on the past ten or so years of Baylor history.

> "Whether you agree with Ben Stein and crew's opinions or not, this is a period of Baylor's history that should at least be considered."

201. Expelled Trailer, "It's Awesome" [video]. Trailer photos: [1], [2], [3].

202. Hardy Parkerson, "From Professor Marks," PoliticsLA.com

> "Would you do me a favor and go see a movie on Friday, April 18 or that weekend? And take some friends? Here's why."
>
> "The film is endorsed by James Dobson (Focus on the Family), Chuck Colson, Lee Strobel, and Evangelist Luis Palau. The movie 'blew Rush Limbaugh away'. ... Here is an internet endorsement by presidential candidate Mike Huckabee. I've seen a prescreening of the movie - and it is powerful."

203. Harry Forbes and John Mulderig "Expelled: No Intelligence Allowed," Catholic News Service, April 23, 2008.

> "...supporters of intelligent design featured here include mathematician David Berlinski, theologian Alister McGrath and Baylor University engineering professor Robert J. Marks II."

204. Jack & Shirley, "Baylor Rejects Intelligent Design," Notes From A Retired Preacher, April 23, 2008

> ""Baylor University, formerly a great Baptist university in Texas has unveiled their true colors. They have succumbed to the religion of Darwinism by rejecting the concept of Intelligent Design (that the universe in which we live was created by a greater Intelligence). Biblical Christians reject the ridiculous theory of Darwinism and evolution."
>
> "Pray for the students and administration at Baylor."

205. Bob Ellis "Thoughts on Ben Stein's Expelled," Dakota Voice, WEDNESDAY, APRIL 23, 2008.

> "When Baylor University found out Professor Robert Marks believed in intelligent design, they forced him to shut down his website and return grant money. What was this college professor thinking–that he could just think what he wanted, believe what seemed reasonable to him???"

206. James Perloff, "Allow Intelligence!" The John Birch Society, April 24, 2008.

207. Denyse O'Leary, "Things we know but cannot prove - another nail in the coffin of materialism," Mindful Hack, April 25, 2008.

> "Recently, I highlighted a talk that Prof. Robert Marks, distinguished professor of electrical and computer engineering at Baylor University, gave to Baylor's American Scientific Affiliation branch on things we know but cannot prove (and it doesn't matter how big computers get)"
>
> "I asked Marks how it went, and he wrote back to say,

> "This is mind bending stuff. Stephen Hawking, for example, is becoming agnostic in his belief there is a single theory that describes all of physics. There look to be things that are true simply because they are true. They cannot be derived from first principles. And there exist things, like Chaitin's astonishing number between zero and one, that we can prove we will never know. The foundations of algorithmic information theory has been around since the 1930's, but scientists and mathematicians are only recently appreciating its significance.
> "Algorithmic information theory and string theory make the science fiction I read as a boy seem boring."

I watched Marks's PowerPoint on line, and highly recommend it."

208. Denyse O'Leary, "The fours be with you! ... and double cream, half sugar, please." The Mindful Hack, FRIDAY, APRIL 25, 2008.

> "Here's the number word game called The Four's Be With You, from Prof. Bob Marks's presentation on things computers will never do:
> "Spell a number. (Say, t-w-o.)
> "Count the letters. (3)
> "Spell that number. (t-h-r-e-e)
> "Count the letters of that number. (5)
> "Count the letters of that number. (f-i-v-e = 4)
> "Prof. Marks says, you will always end at four/4 letters.
> "Huh? I tried it a few more times:
> "Twenty 6
> six 3
> three 5
> five 4
>
> "thirty-six 8 [I suppose I should not count hyphens]
> eight 5
> five 4
>
> "Okay, I am trying this one more time. I have work to do:
> "one hundred thirty eight [I suppose I should leave out the "and"] 21
> twenty one 9
> nine 4
> "This seems like a good icebreaker, while we wait for late arrivals at a meeting. But you have to wonder about people who figure this kind of stuff out. Like what weren't they doing? (Stocking the shelves? Mending fence? Answering the phone at the Complaints desk? Might explain a lot ...)"

209. Matthew Lickona and Ernie Grimm "Talk About Movies: Expelled: No Intelligence Allowed," California Catholic Daily, April 26, 2008.

210. Don Harper, "Need To See," Raves, Rants & Roses, April 29, 2008.

> "RAVE: I don't usually like to advertise movies, but there's one out there you need to see: 'EXPELLED,' starring Ben Stein, and I give him raves for his documentary about so many professors being "expelled" from our major universities' Science Departments (including our beloved Baylor) because of their belief in Intelligent Design behind the creation of our universe as opposed to Darwin's theory that man descended from apes, evolution, etc. "

211. Tim Woods "Battling academic elites for the universe: Q&A with 'Expelled' producer Mark Mathis," Waco Tribune, April 29, 2008

> *Expelled: No Intelligence Allowed* associate producer Mark Mathis took time to speak with the Tribune-Herald on Friday. Here is a Q&A from that discussion:
>
> Q: Expelled opened in the top 10. Are you happy with the early numbers?
>
> A: Yeah, when you look at documentary films, it's pretty rare for any documentary film to debut in the top 10, and certainly on 1,052 screens, which is pretty significant for a documentary film. So, to finish (in the top 10), I think we did exceptionally well.
>
> Q: Was it difficult to get Baylor University professor Robert Marks to speak to you for the film?
>
> A: When we came down, it was following his Web site being shut down and all the big dust-up had already happened and I think at that point he apparently had made the decision that he was going to talk about it. We wanted him to talk about it, of course, because it's hard to get people to talk. They don't want to talk. Why would I want more of this grief, because the Darwinists are going to come after me in the most strident and vicious ways. Who would want to heap that upon themselves? You've got to be a pretty tough, courageous person to do that. Good for Robert Marks, that he has the courage to stand up for his principles.

212. Tim Woods, "Film puts Baylor dust-up over intelligent design in the cinematic limelight," Waco Tribune, Tuesday, April 29, 2008.

> "Baylor University distinguished professor of engineering Robert Marks had strong words for the school in a recently released movie but says he recognizes Baylor is in a difficult position, trying to balance its Christian heritage with lofty research goals.
>
> "Marks is one of several people whose cases are profiled in Expelled: No Intelligence Allowed, a film featuring attorney, actor and political commentator Ben Stein on a quest to expose cases of academic and intellectual suppression.

"Specifically, the film seeks to show that scientists and academics who study the possibility of intelligent design in nature or even the possibility of God, rather than random chance, are being persecuted by scientific elite holding 'neo-Darwinist' world views.

"Marks' involvement in Expelled centers on a Web site about his evolutionary informatics research lab. The research is friendly to the philosophy of intelligent design, Marks says, but is not direct intelligent design research.

"The site, formerly on Baylor's server, was shut down last year by school officials who claimed it lacked sufficient disclaimers that the work was in no way that of Baylor University.

" 'What we say is you have the freedom to formulate your own views and so forth, just make sure that you issue a disclaimer that your particular view does not necessarily express the view of Baylor University,' Baylor Provost Randall O'Brien explained in September, when an Expelled film crew was in Waco trying to talk with President John Lilley. 'We fully endorse the right and responsibilities of academic freedom.'

"In Expelled, however, Marks says he has no doubt the site was shut down because of its relationship to intelligent design.

" 'The fact that this was singled out, let alone shut down, is jaw-dropping,' he says in the film. Baylor spokeswoman Lori Fogleman, who spoke to Expelled associate producer Mark Mathis in September Lilley was out of town said she hasn't yet seen the movie. However, she took issue with Marks' claim the site was shut down because of its intelligent design connection.

"Once a professor fulfills his or her obligation to the school, that person is free to conduct any outside research 'as long as he or she does not represent that work as being connected to Baylor University,' Fogleman said. Marks' site has since been moved to a remote server.

Expelled, shown locally at Starplex Galaxy 16, 333 S. Valley Mills Drive, has met moderate success both locally and nationally. In its opening weekend, the film grossed nearly $3 million, according to Box Office Mojo, with a healthy per-screen average of almost $3,000."

213. O'Leary, "Expelled at Baylor: Local reaction to film varies," Uncommon Descent, April 30, 2008

214. Richard Kirk, "*Expelled: No Intelligence Allowed*: Reviewing the Philosophical Issues," California Republic, May 2, 2008

"As expected, Ben Stein's new documentary has been given a chilly reception by most reviewersby folks inclined to sympathize with the moral stylings of Joy Behar and reluctant to express opinions at odds with gray eminences at The New York Times."

",,, at Baylor University, Engineering Professor Robert Marks II saw his school web site unplugged and grant money revoked when his work on information theory began interfacing productively with ID. These are only two

of several examples presented in the film. Collectively, these cases expose a widespread effort to marginalize academics who raise questions about Darwinian theory and to ignore research that suggests what Sir Isaac Newton assumedthat an intelligent designer sustains the cosmos."

215. "Expelled: A Commentary on the Culture," Perservering Pastor, May 2, 2008

216. Robert J. Marks II, IMDb Filmography, May 3, 2008

217. O'Leary, "Baylor Prez Spins Expelled Worries: The God of the Bible is the God of the genome but not of the Evolutionary Informatics Lab," Uncommon Descent, May 4, 2008. [Lilley's Letter]

    "Taking a break from 'Imagining' no heaven, no hell, no Yoko Ono, and no delay till the Expelled DVD comes out, I note where John Lilley, Baylor's president, has seen fit to defend his institution in the light of the unflattering portrait in Expelled.

    "Except he doesn't exactly. In the form letter - apparently written to people for whom, in his words, Expelled has been a 'source of concern' - he manages to say nothing at all."

    "In short, in his letter, Lilley doesn't address the 'source of concern' at all. He is apparently gambling that the waves created by Expelled will just subside. And anyway, if Baptists don't give to Baylor, who they gonna give to?"

218. David "Baylor and Gomorrah," He Lives, Monday, May 05, 2008.

219. Marie T. Sullivan, "Great Debate ... at a Theatre Near You!" The Chicago Daily Observer, May 7, 2008.

220. "Go See It." The (Re)Publican, May 10, 2008.

    "Yesterday I saw Ben Stein's movie Expelled: No Intelligence Allowed. If it is playing at a theatre near you, you really must go see it. It is informative, entertaining, challenging, even moving."

221. Rev. Bryan Griem, "Movie review *EXPELLED: No Intelligence Allowed*," Christian Answers, April 18, 2008.

    "Touché! 'Expelled: No Intelligence Allowed' has made Ben Stein the new hero of believers in God everywhere, and has landed a smart right cross to the protruding jaw of evolution's elite."

222. "Expelled," Too Conservative, May 20, 2008

    "For those who haven't seen Ben Stein's EXPELLED yet, I highly recommend it."

    "A lot of the movie is about Baylor University(where I am attending) where an Intelligent Design Institute was founded and later dissolved."

223. William Dembski, "Baylor President Lilley Fired," Uncommon Descent, 24 July 2008

> "This just in from Christianity Today. Lilley, you will recall, expelled Robert Marks's Evolutionary Informatics Lab from Baylor."

224. JEANNIE KEVER "Citing lost confidence, Baylor regents fire president," Houston Chronicle, July 24, 2008.

225. Rack Jite "Baylor University President John M. Lilley Fired," KicK, Friday, july 25. 2008

226. "Intelligent Design Watcher," Kumicit's Blog, July 26, 2008.

> "Robert Marks, distinguished professor of electrical and computer engineering at Baylor, launched a website called the Evolutionary Informatics Lab in June to examine whether Darwinian processes like random mutation and natural selection can generate new information.
>
> "Marks' conclusions, as explained on the website, placed limits on the scope of Darwinism and offered scientific support for Intelligent Design."

227. O'Leary, "Yes, it's true! The ID Taliban brought about Baylor Prez Lilley's downfall..." Uncommon Descent, July 27, 2008.

> "Apparently, some fans of the ruins of neo-Darwinism think that President John Lilley's departure from Baylor relates to intelligent design."

228. Carrie Sager, "MEET THE MARTYRS: Robert Marks, Pamela Winnick, Michael Egnor." EBSCO,

229. Amazon.com Prerelease of DVD, August 10, 2008. [List]

> "Expelled: No Intelligence Allowed Ben Stein, Richard Dawkins, Robert J. Marks II, and Mark Souder (DVD - 2008)"

230. Barbara F. Hollingsworth, "America's new blacklist," DC Examiner, August 13, 2008.

> "'Expelled' does an excellent job of exposing the new blacklisting at tax-supported institutions of higher learning, where academic freedom is supposed to be the guiding principle and professors are supposed to be able to follow the evidence wherever it leads."

231. "Ben Stein's Expelled DVD," Fanbolt,

> "This year's highly anticipated faith and family release Expelled arrives on DVD October 21 from Vivendi Entertainment. Co-writer and Host, Ben Stein (Ferris Bueller's Day Off, 'Win Ben Stein's Money'), explores the ongoing conflict between advocates of intelligent design and evolutionists."

232. Henk Rijkers "Intelligent Design is 'Streng verboten!', " Katholiek Nieuwsblad, November 4, 2008.

"Professor Robert J. Marks werd aangepakt door zijn universiteit Baylor University, omdat men een verband ontdekte tussen zijn onderzoek en ID."

233. TOM GOODMAN "Stein's 'Expelled' and Baylor University," Get Anchored, Saturday, November 15, 2008.

"Yesterday I saw the Ben Stein film, Expelled: No Intelligence Allowed. Worth watching, especially since it has annoyed all the right people.

"My alma mater–and the school both sons plan to graduate from–is featured in the film. Robert Marks, who holds the title of distinguished professor of engineering at Baylor University has been using highly sophisticated mathematical and computational techniques to determine if there are limits to what natural selection can do."

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234. Wintery Knight "New podcasts and video in intelligent design controversy," Salvo Magazine, February 06, 2009.

"Podcast: Dr. Robert Marks and the Evolutionary Informatics Lab: Marks, a Distinguished Professor of Electrical and Computer Engineering, ran afoul of Texas's Baylor University when he started to show that a number of computer programs that seek to prove Darwinian evolution mainly prove that hope springs eternal. The U took his Web site down. He has a paper coming up for publication on this subject, if it is not suppressed."

235. "I'm not close-minded about evolution," Good Word Editing, February 10th, 2009

236. Casey Luskin " 'Expelled Exposed' Exposed: Your One-Stop Rebuttal to Attacks on the Documentary Expelled," Evolution News & Science, February 17, 2009

"'Expelled Exposed' leaves off key facts about the persecution Robert Marks endured at Baylor University and tries to make it sound like his persecution was reasonable (more on this below). In the end, Marks' website was permanently shut down, Baylor pressured Marks to cease his ID-related research, and Baylor even returned grant money given to Marks to hire research assistants his ID-related work. For the full story on Marks that 'Expelled Exposed' doesn't tell you, see:

'Academic Freedom Expelled from Baylor University'
'BU had role in Dembski return'

Ironically, by admitting that Marks's treatment was related to his ID work (they acknowledge it concerned 'the intelligent design material'), 'Expelled Exposed' has admitted precisely what Baylor denied. For details, see 'Credibility Gap: Baylor Denies Robert Marks' Situation Has Anything to do with ID.' "

237. Admin " 'Expelled Exposed' Exposed," Christian News, February 20, 2009.

    "Your One-Stop Rebuttal to Attacks on the Documentary Expelled."

238. Posts on Active Information, QUANTUM NON-LINEARITY, February 28, 2009. [Part #1], [Part #2], [Part #3], [Part #4].

239. Russell Huebsch, "Is Robert J. Marks the Greatest Scientist of Our Generation?" Associated Content, February 25, 2009.

    "2008 saw the release of Ben Stein's 'Expelled: No Intelligence Allowed,' a documentary on the prejudice of Intelligent Design theory in the academic world."

    "What I found out is that perhaps the smartest man of the 21st century, helping develop technology like the wireless mouse, is also a creationist and a proponent of what the academic world has label a psuedo-science.

    Here a just a few of Dr. Marks' contributions to the advancement of the scientific world. Marks and fellow colleagues, then at University of Washington, developed a sophisticated way of predicting power demands on utility grids using what he calls an "artificial neural network". Usually just called "neural networks", neural networks are essentially just computational models to measure non-linear statistical data.

    "In true renaissance fashion Robert Marks also used his genius level knowledge of statistical models to track radioactive seeds in cancerous prostates in real time! Marks and his team would receive the Judith Stitt Best Abstract Award from the American Brachytherapy Society, brachytherapy is radiotherapy where a radioactive source is placed next or inside the area needing treatment.

    "In the area of detection theory, or just the ability to determine whether radio waves are just noise or an actual signal, Dr. Marks and his team described the performance of the Neyman-Pearson optimal detector in non-Gaussian noise using a closed form solution.

    "If Dr. Marks had just revolutionized just one field of study he would be considered nothing short of a genius, to earn such high accolades from such a variety of fields of study is an accomplishment that only ranks up there with the likes of Newton and Einstein. Marks even has an award from NASA for helping them develop more power efficient communication amongst wireless arrays!

    "As one can see, Dr. Marks has done more with his life in his 50 some odd years on the planet, than a hundred men can do in a life time. The most exciting part is that Dr. Marks still has plenty of time left in his career to revolutionize many more areas of science. Maybe some day you can tell your grandkids that you heard of the genius of Dr. Marks and the Marks family before they became icons of the 21st century?"

240. O'Leary, "Oh No, Ono files: Expelled is #8 in documentaries," Uncommon Descent, 21 March 2009.

> "Anyway, this is how the film is doing in DVD:
> Amazon.com Sales Rank: #294 in Movies & TV (See Bestsellers in Movies & TV)
> Popular in these categories:
> #8 in Movies & TV: Documentary
> #70 in Movies & TV: Comedy
> #8 - that's in the Top Ten in docs. Not bad for a film that so many were determined to destroy. Even St. Yoko Ono wow!"

241. TFN "Science Takes Hit in Texas," Texas Freedom Network, March 27, 2009.

242. William Dembski "ScienceBlogs praises/disses Dembski-Marks paper on Conservation of Information," Uncommon Descent, May 9, 2009.

243. Casey Luskin,"New Peer-Reviewed Scientific Article From William Dembski and Robert Marks Challenges the Creative Mechanism of Darwinian Evolution," Evolution News & Science, August 18, 2009

> "A new article titled 'Conservation of Information in Search: Measuring the Cost of Success,' in the journal IEEE Transactions on Systems, Man and Cybernetics A, Systems & Humans by William A. Dembski and Robert J. Marks II uses computer simulations and information theory to challenge the ability of Darwinian processes to create new functional genetic information."
>
> "After assessing various examples of evolutionary searches, Dembski and Marks show that attempts to model Darwinian evolution via computer simulations, such Richard Dawkins' famous "METHINKSITISLIKEAWEASEL" example, start off with, as Dembski and Marks put it, 'problem-specific information about the search target or the search-space structure.' According to the paper, such simulations only reach their evolutionary targets because there is pre-specified 'accurate information to guide them,' or what they call 'active information.' The implication, of course, is that some intelligent programmer is required to front-load a search with active information if the search is to successfully find rare functional genetic sequences. They conclude, 'Active information is clearly required in even modestly sized searches.' "

244. William Dembski "New Peer-Reviewed Pro-ID Article in Mainstream Math/Eng Literature," Uncommon Descent, August 19, 2009.

> "William A. Dembski and Robert J. Marks II, 'Conservation of Information in Search: Measuring the Cost of Success,' IEEE Transactions on Systems, Man and Cybernetics A, Systems & Humans, vol.39, #5, September 2009, pp.1051-1061.

Our critics will immediately say that this really isn't a pro-ID article but that it's about something else (I've seen this line now for over a decade once work on ID started encroaching into peer-review territory). Before you believe this, have a look at the article. In it we critique, for instance, Richard Dawkins METHINKS*IT*IS*LIKE*A*WEASEL (p. 1055). Question: When Dawkins introduced this example, was he arguing pro-Darwinism? Yes he was. In critiquing his example and arguing that information is not created by unguided evolutionary processes, we are indeed making an argument that supports ID."

245. Clive Hayden "PZ Myers Does It Again," Uncommon Descent, August 20th, 2009.

"PZ Myers has, once again, railed against something that he doesn't understand at his blog Pharyngula. Hi PZ! Notice that he doesn't actually address the content of Dr. Dembski and Dr. Marks' paper, which you can read here: Conservation of Information in Search: Measuring the Cost of Success, published at the IEEE. Given his argument, he doesn't know how to measure the cost of success, yet claims that Dr. Dembski doesn't understand selection. A bit of advice PZ, the argument presented by Dr. Dembski and Dr. Marks is very sophisticated PZ, your mud slinging isn't PZ, you need to step it up PZ. I know this new stuff isn't ez, but you may want to consider a response that has actual content PZ. Your argument against this peer-reviewed paper is still in its infancy, or, more accurately, still in the pharyngula stage, embryonic in its development.

"Since evolution of the kind PZ subscribes to cannot be witnessed, the argument has moved into genetic algorithms with the advent of computational abilities to determine the affair, and the IEEE is an entirely appropriate place to publish on that subject. We're not going anywhere, we'll give him time to catch up and educate himself to the tenets of the paper's actual content. And if/when he does, maybe he'll write another blog, and possibly write one with active information, that is, actual information, or else his argument will never reach it's target."

246. William Dembski, "Evolutionary Informatics as Intelligent Design and not as Theistic Evolution," Uncommon Descent, August 23, 2009

"The paper on evolutionary informatics by Robert Marks and me that was recently published in an IEEE journal (go here for the paper) continues to generate discussion on the Internet. One criticism is that it at best is consistent with theistic evolution but does not support ID. I think this is a mistake. I've said for over a decade now that ID is consistent with the most far-flung evolutionary change. The key contention of ID is that design in nature, and in biology in particular, is detectable. Evolutionary informatics, by looking at the information requirements of evolutionary processes, points to information sources beyond evolution and thus, indirectly, to a designer. Theistic evolution, by contrast, accepts the Darwinian view that Darwinian processes

generate the information required for biological complexity internally, without any outside source of information. The results by Marks and me are showing that this cannot be the case. The paper just published is only the first installment. It essentially lays out our accounting procedure for measuring the information in evolutionary search. We have two forthcoming papers that flesh out our larger project (available at www.evoinfo.org/publications), showing that attempts to account for the information internally, without an external information source, all founder."

247. William Dembski, "The argument just keeps rumbling on ..." Uncommon Descent, August 25, 2009.

"A curious piece was posted a few days back by Ewen Callaway at the New Scientist (go here). Its focus was on the recent IEEE paper by Robert Marks and me on conservation of information (for the paper, go here). Callaway remarks: 'Even if a paper supporting ID has made it past peer review and no doubt the arguments will rumble on it seems like nothing much has changed.'

"Callaway and his colleagues are welcome to hide their heads in the sand and pretend that nothing has changed. But at the next Dover trial, as the body of peer-reviewed work supporting ID continues to grow (Marks and I have plenty in the pipeline, and there are other labs now getting into the act), it will no longer be possible for the next Judge Jones to dismiss ID for lack of peer-reviewed papers (even at the Dover trial, Jones was mistaken to claim that no peer-reviewed work supports ID).

"Nothing much has changed when a camel first starts sticking its nose into a tent. And nothing much has changed just at the moment something begins to slide down a slipperly slope. Nothing much has changed when a virulent bug first invades a body. But soon enough everything has changed."

248. O'Leary "Uncommon Descent Contest Question 10: Provide the Code for Dawkins' WEASEL Program," Uncommon Descent, August 26, 2009.

"Special invitation for Richard Dawkins but any civil person is entitled to enter.

"There's been some discussion here and elsewhere whether the the recent IEEE article by Dembski and Marks correctly characterizes Richard Dawkins' famous METHINKS IT IS LIKE A WEASEL program.

"Does the program ratchet correct letters or does it let them vary?"

249. I.D. the Future "Information and Clear Accounting in Evolution," Casey Luskin interviews William Dembski about the Dembski-Marks paper, October 1, 2009 [Audio]

250. Andrew Comings, "BOOK REVIEW - BURIED HOPE OR RISEN SAVIOR," Sharper Iron, October 6, 2009.

"On February 26, 2007, Oscar-winning film director James Cameron (of Titanic fame) and Emmy-winning host of History Channel's The Naked Archeologist, Simcha Jacobovici, held a press conference in New York City and claimed that they had found the the tomb of Jesus of Nazareth."

"This world, however, is far from perfect, and its inhabitants notorious for their gullibility. So we must defend the Christian hope against those who would seek to take it away. Enter Dr. Charles L. Quarles, professor of religion at Louisiana College, who probably could have written *Buried Hope or Risen Savior* by himself and done an outstanding job. Instead, he assembled an academic 'dream team,' and together they deliver a slam-dunk against the over-hyped documentary and its perpetrators."

"The next chapter was the most daunting for me, as William A Dembski (mathematician) and Robert J. Marks II (rocket scientistreally!) tackle the mathematics behind the claim that 'the probablility that the Talpiot tomb could be other than the tomb of Jesus [is 1 in 600]. Thus, conversely, it is supposed to be highly probablewith probability 599 in 600that this is Jesus' tomb' (p. 113). As they delve into the world of numbers, the non-mathematician's head begins to hurt. The chapter is full of sentences like this one:

> "Since E denotes the naming of a male and F the naming of a female, P(E) = P(E & Person-Named-Is-Male) = P(E — Person-Named-Is-Male) x P(Person-Named-Is-Male) = 231/2,509 x$\frac{1}{2}$ and P(F) = P(F & Person-Named-Is-Female) = P(F — Person-Named-Is-Female) x P(Person-Named-Is-Female) = 80/317 x $\frac{1}{2}$.

"Fortunately for the mathematically challenged, the book includes sections like the one found on pages 127-128, which put the mathematical concepts into regular language and provide helpful illustrations."

251. William Dembski, "New Dembski-Marks Paper," Uncommon Descent, December 7, 2009.

"William A. Dembski and Robert J. Marks II, 'Bernoulli's Principle of Insufficient Reason and Conservation of Information in Computer Search,' Proceedings of the 2009 IEEE International Conference on Systems, Man, and Cybernetics. San Antonio, TX, USA October 2009, pp. 2647-2652."

252. William Dembski, "Deconstructing Avida," Uncommon Descent, December 11, 2009

"Back in 2003 NATURE (vol 423, pp 139-144) published an article by Richard Lenski, Charles Ofria, Robert Pennock, and Christoph Adami titled 'The Evolutionary Origin of Complex Features.' "

"At no point in the paper is ID or any proponent of ID cited. Yet, when co-author Christoph Adami gave a PowerPoint presentation on Avida at a AAAS meeting some time back in Washington DC, his concluding slide showed Behe and his book DARWIN'S BLACK BOX. Moreover, Adami

indicated that the whole point of this work on Avida was to refute Behe. Likewise, when co-author Rob Pennock wrote his expert witness report for the Kitzmiller v. Dover case, he claimed that his work on this NATURE article constituted a refutation of Behe.

"The hypocrisy here is breathtaking. On the one hand, we are told that ID is not science. On the other hand, articles in places like NATURE appear that are clearly motivated by ID. And yet, the articles themselves are scrupulous to avoid referencing ID, its proponents, or published writings lest we gain an entry in the Science Citation Index and thus can further strengthen the case that ID is indeed science.

"It was clear to the authors of the NATURE article that the shrill, illogical reviews of Behe that appeared early on would not silence him. But it was also clear to them that addressing him forthrightly in a prominent scientific venue could backfire, indicating that Behe was on to something important even if he was ultimately wrong. Some scientific mistakes are illuminating. If Behe were charged with committing an illuminating scientific mistake, then he would still be doing science (rather than pseudoscience or religion). Hence the subterfuge of not citing him at all the in NATURE article.

"In any case, a thorough deconstruction of Lenski et al.'s article and of Adami's Avida program has been long overdue. That deconstruction is now available:

"Winston Ewert, William A. Dembski and R.J. Marks II, 'Evolutionary Synthesis of Nand Logic: Dissecting a Digital Organism,' Proceedings of the 2009 IEEE International Conference on Systems, Man, and Cybernetics. San Antonio, TX, USA October 2009, pp. 3047-3053."

253. Casey Luskin "Winston Ewert, William Dembski, and Robert Marks Publish Mainstream Scientific Paper Exposing Flaws in Avida Evolution Simulation," Evolution News & Science, December 31, 2009.

"In 2003, evolutionary biologist Richard Lenski, philosopher Robert Pennock and others co-published a Nature paper titled "The evolutionary origin of complex features" reporting results of a computer simulation of evolution dubbed 'Avida.' Though publicly arguing that Avida refuted intelligent design by showing the evolution of irreducible complexity, their paper refused cite the work of Michael Behe or any other ID proponent. Now, Winston Ewert, William Dembski, and Robert Marks expose in a paper in Proceedings of the 2009 IEEE International Conference on Systems, Man, and Cybernetics why Lenski and Pennock's 'Avida' simulation fails to accurately model Darwinian evolution.

Darwinian evolution has no prior knowledge about the search target, but Avida's programmers have intelligently designed Avida by smuggling in "active information" to help the program overcome the handicap of Darwinian blindness. Avida is based upon the premise that its target function ('EQU')

will be eventually found simply by building on simpler logic functions. Ewert, Dembski, and Marks call this attempt to model a stepwise advantage 'stair step active information,' observing that 'Avida uses stair step active information by rewarding logic functions using a smaller number of nands to construct functions requiring more.' Significantly, Ewert, Dembski, and Marks find that 'Removing stair steps deteriorates Avida's performance,' quoting from Lenski and Pennock's paper admitting that "where only EQU was rewarded ... none of these populations evolved 'EQU.' Avida is thus designed to evolve, even though its designers don't make that clear. Ewert, Dembski, and Marks thus conclude with the exhortation that, '"To have integrity, computer simulations of evolutionary search like Avida should make explicit ... the prior knowledge that gives rise to the active information in the search algorithm.' "

254. Access Research Network, "Top Ten Darwin and Design Science News Stories for 2009," ARN, December 31, 2009.

> "#1. Intelligent Input Required for Life. In a significant peer-reviewed article in the September 2009 journal IEEE Transactions on Systems, Man and Cybernetics authors William A. Dembski and Robert J. Marks II use computer simulations and information theory to challenge the ability of Darwinian processes to create new functional genetic information. This paper is in many ways a validation of Dembski's core ideas in his 2001 book, No Free Lunch: Why Specified Complexity Cannot Be Purchased without Intelligence, which argued that some intelligent input is required to produce novel complex and specified information."

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255. ARN Staff, "Post details: 2009 Top Ten Darwin and Design Science News Stories," In the News, January 12, 2009

> "Access Research Network has just released its annual "Top 10 Darwin and Design Science Stories" for 2009.
>
> "Gaining top honors on the list was a peer-reviewed article by intelligent design theorists William Dembski and Robert Marks II in the September 2009 journal IEEE Transactions on Systems, Man and Cybernetics. The authors used computer simulations and information theory to challenge the ability of neo-Darwinian processes to create new functional genetic information."

256. O'Leary, "Top ten ID science stories of the year," Uncommon Descent, January 17th, 2010

> ""Well, here are three of the top ten winner stories, and I have inserted some comments, with further stories to follow if you click on the link:
>
> "1. Authors William A. Dembski and Robert J. Marks II use computer simulations and information theory to challenge the ability of Darwinian processes to create new functional genetic information. This paper is in many ways a validation of Dembski's core No Free Lunch: Why Specified Complexity Cannot Be Purchased without intelligence, which argued that some intelligent input is required to produce novel complex and specified information."

257. ID the Future"Meyer and Dembski Breakthroughs Top ID Science Stories for 2009," January 21, 2010. [Podcast: ARN Top Ten]

258. ID the Future, "Graduate Student Challenges Avida in Scientific Paper," March 01, 2010. [Podcast]

259. William Dembski, "Winston Ewert With pro-ID grad students like this, Darwinian profs don't stand a chance," Uncommon Descent, March 4, 2010

260. William Dembski, "New Peer-Reviewed ID Paper Deconstructing the Dawkins WEASEL," Uncommon Descent, March 9, 2010.

> "Winston Ewert, George Montaez, William A. Dembski, Robert J. Marks II, 'Efficient Per Query Information Extraction from a Hamming Oracle,' Proceedings of the the 42nd Meeting of the Southeastern Symposium on System Theory, IEEE, University of Texas at Tyler, March 7-9, 2010, pp.290-297."

261. "The 20 Most Brilliant Christian Professors," College Crunch, March 10, 2010.

> "The professors listed here are all 'brilliant' in the original sense of the wordthey shine brightly among their peers as towering figures in the academic world. In addition, they are all Christians who do not hide their Christianity and see it as significantly impacting their intellectual work.
>
> "We have limited this list to professors who teach in the English-speaking world. A few listed here have officially retired or moved on to other responsibilities, but in each case they keep close ties to the academic world."
>
> "Robert Jackson Marks II (1950-)
>
> "Distinguished Professor of Electrical and Computer Engineering at Baylor University. A founder of the field of computational intelligence (comprising fuzzy sets, neural networks, and evolutionary computing), Marks has published hundreds of articles on an very wide range of problems (everything from optimal detection of non-Gaussian noise to proper placement of radioactive inserts to treat prostate cancer). His work has enormous practical implications that are felt every dayall major North American utilities deliver energy using his work on neural networks. An Christian intent on

> understanding teleology in nature, Marks founded the Evolutionary Informatics Lab, which publishes peer-reviewed scientific papers supporting the controversial theory of intelligent design."

262. Casey Luskin, "William Dembski, Robert Marks, and the Evolutionary Informatics Lab Take on Dawkins' 'WEASEL' Simulation in New Peer-Reviewed Paper," Evolution News & Science, April 8, 2010.

> "A new peer-reviewed paper continues the work published by William Dembski, Robert Marks, and others affiliated with the Evolutionary Informatics Lab... The authors argue that Richard Dawkins' 'METHINKSITISLIKEAWEASEL' evolutionary algorithm starts off with large amounts of active informationinformation intelligently inserted by the programmer to aid the search."

263. Tim Woods "Baylor faculty member named one of '20 Most Brilliant Christian Professors'," Waco Tribune-Herald, April 15, 2010. [

264. Newspaper]

> "Robert Marks, Baylor University Distinguished Professor of electrical and computer engineering, once again finds himself in the spotlight.
>
> "Less than three years ago, Marks was at the center of an intelligent design-related controversy at the school.
>
> "But Marks now is being honored for his work, notably his research in the area of evolutionary informatics.
>
> "CollegeCrunch.org, a college resource Web site, named Marks as one of 'the 20 most brilliant Christian professors.'
>
> "CollegeCrunch said professors included on the list 'shine brightly among their peers as towering figures in the academic world.'
>
> "Included are professors from such renowned universities as Johns Hopkins, Harvard, Notre Dame, Princeton, Rice, Stanford, Cambridge and Oxford. The list was limited to professors in English-speaking countries.

265. William Dembski "College Crunch honors Robert Marks for Work on ID," Uncommon Descent, April 15, 2010.

266. KWKT Fox44,"Baylor professor receives recognition," April 15, 2010.

267. "The 20 Most Brilliant Christian Professors," The Book of Doctrines and Opinions: notes on Jewish theology and spirituality, April 17, 2010.

268. Sara Tirrito, "Baylor professor ranked among most brilliant," Baylor Lariat, April 21, 2010. [Newspaper]

> "A distinguished professor in electrical and computer engineering, Dr. Robert Marks' work spans multiple areas, including computer program evolution

simulation, swarm intelligence work for the U.S. Navy, intelligent design and information theory.

" Recently, Marks was honored as one of the 20 Most Brilliant Christian Professors by collegecrunch.org. The list includes professors from universities such as Boston, Princeton, Stanford and Cambridge, among others.

" 'It was a complete surprise. I had no idea the list was coming out,'Marks said. 'It's astonishing. That's the greatest sort of thing that can happen, when something comes totally out of the blue. I think the really surprising thing is some of the incredible people on there whose company I keep.'

"Marks' work dealing with aspects of intelligent design has caused controversy on campus in the past, leading to the removal of his evolutionary informatics website from the university's server. However, Marks remains hopeful that Baylor will become more open to controversial research of this type.

" 'They want to be recognized as a research university and also celebrate the lordship of Christ,' Marks said. 'We're told as Christians we should not pursue the recognition of man. Our job should be rather to please our Lord, not man, and this isn't present in every decision that Baylor makes, but certainly in a number of them and will determine whether Baylor will achieve this lofty goal of being a research university that celebrates the lordship of Christ.

" 'I think if there's anywhere in the world there should be a dialogue about the sort of work I'm doing, it should be at Baylor.'

In his time at Baylor, Marks has worked with various professors in the electrical and computer engineering department.

" 'I came to Baylor because of 2012 – they wanted to be a cutting-edge university in terms of research and celebrate the lordship of Christ and I said that's what I want to spend my career doing,' Marks said. 'I spend most of my time actually doing research with other people; that's why I feel that I'm here.'

"Currently, Marks is working on a project with Dr. Charles Baylis, assistant professor of electrical and computer engineering, who said Marks' work stands out because of his desire to honor Christ through his research.

" 'From what I can tell and what I've observed, Dr. Marks is interested in doing his work to bring honor to Jesus Christ. He's committed to following Jesus Christ first and honoring him first and he sees his research as a way of doing that,' Baylis said. 'I think it's interesting too because I think our mission here at Baylor is so unique. We train our students to first be followers of Christ who happen to be engineers. I think he embraces that role of training students to do that.'

"Dr. Ian Gravagne, associate professor of electrical and computer engineering said that because Marks' work integrates both faith and academics, it can serve as a reminder that faith doesn't have to be abandoned in pursuit of

knowledge.

" 'I think it's also important for the world generally to see that from within Christianity can also come some of the greatest intellectual ideas,' Gravagne said. 'That's not a new concept, but I think lately we've sort of forgotten that many of the giants in science and mathematics in the past we're Christians.'

"Marks said he hopes being included on collegecrunch's list will also help show others that faith and intellect can coexist.

" 'I hope this list in general shows there is no reason that a person who is intellectually gifted should not be a Christian,' Marks said."

269. William A. Dembski, "FIRST-PERSON: Vindication for I.D. at Baylor?" Baptist Press, May 6, 2010.

270. William Dembski "Baylor's New President Meets Baylor's New Super-Genius Professor," Uncommon Descent, May 7, 2010.

271. William Dembski, "EVIDENCE FOR GOD now shipping!" Uncommon Descent, June 18, 2010.

"The following anthology, coedited by me and Mike Licona [EVIDENCE FOR GOD], is now available at Amazon.com:

"Here's the table of contents for the science section:"

"17. Evolutionary Computation: A Perpetual Motion Machine for Design Information? Robert J. Marks II"

272. Clive Hayden, "Robert Marks: The 'Charles Darwin' of Intelligent Design," Uncommon Descent, August 5, 2010.

"Evolution was a known concept before Darwin published his Origin of Species in 1859. But Darwin's work on evolution pushed it from obscurity to a widely known and accepted concept. Part of what helped Darwin in pushing through evolution was the credibility he had acquired from publishing lots of specialized scientific treatments (such as an extended treatise on barnacles) before publicly wading into evolution.

"Fast forward to the beginning of the 21st century. Robert Marks has built a career establishing his credibilityas a foremost thinker and researcher on the topic of computational intelligence. He has amassed an enviable publication record and huge set of government research grants. No one can question his scientific bona fides. And now, with his Evolutionary Informatics Lab (www.evoinfo.org), he is going for broke to establish intelligent design as a scientific research program.

"Just as Darwin made it possible to be an intellectually fulfilled evolutionist, so Robert Marks is making it possible to be an intellectually fulfilled design theorist. Robert Jackson Marks II is THE CHARLES DARWIN OF INTELLIGENT DESIGN!"

273. "The 20 Most Influential Christian Scholars," Super Scholar, September 10, 2010.

> "Super Scholar's 20 most influential Christian scholars have profoundly influenced the world by advancing Christian belief, by reconceptualizing it, or even by fundamentally challenging it. In any case, each of the thinkers below has deeply impacted Western culture's self-understanding."
>
> "Robert J. Marks II
>
> "Robert J. Marks II (b. 1950), Baylor University's leading research professor, has emerged as the public face of intelligent design. As the movement's premier scientist, he has been dubbed 'the Charles Darwin of intelligent design.' At one point, his research on intelligent design was removed by Baylor officials from the university's website. Since then he has published seminal work on such themes as whether computers have minds and whether Darwinian processes can generate biological information. He is widely quoted as saying, 'Computers are no more able to create information than iPods are capable of creating music.' His Law of Conservation of Information purports to demonstrate inherent limitations on natural selection, suggesting that the intricate information needed for life requires an intelligent source."

274. "Does Intelligent Design Help Science Generate New Knowledge?" Evolution News & Science, November 23, 2010.

> "I was recently asked by an evolutionary biologist where ID can help science generate 'new knowledge.' "
>
> "Below are about a dozen or so examples of areas where ID is helping science to generate new knowledge. Each example includes citations to mainstream scientific articles and publications by ID proponents that discuss this research:"
>
> "ID has inspired theoretical research into the information-generative powers of Darwinian searches, leading to the finding that the search abilities of Darwinian processes are limited, which has practical implications for the viability of using genetic algorithms to solve problems. (See: William A. Dembski and Robert J. Marks II, "Conservation of Information in Search: Measuring the Cost of Success," IEEE Transactions on Systems, Man, and Cybernetics-Part A: Systems and Humans, Vol. 39(5):1051-1061 (September, 2009); Winston Ewert, William A. Dembski, and Robert J. Marks II, "Evolutionary Synthesis of Nand Logic: Dissecting a Digital Organism," Proceedings of the 2009 IEEE International Conference on Systems, Man, and Cybernetics, (October, 2009); William A. Dembski and Robert J. Marks II, "Bernoulli's Principle of Insufficient Reason and Conservation of Information in Computer Search," Proceedings of the 2009 IEEE International Conference on Systems, Man, and Cybernetics, (October, 2009); Winston Ewert, George Montanez, William Dembski and Robert J. Marks II, "Efficient Per Query Information Extraction from a Hamming Oracle," 42nd South Eastern Symposium on System Theory, 290-297(March, 2010); Douglas D. Axe,

Brendan W. Dixon, Philip Lu, "Stylus: A System for Evolutionary Experimentation Based on a Protein/Proteome Model with Non-Arbitrary Functional Constraints," PLoS One, Vol. 3(6):e2246 (June 2008).)"

275. Meghan Hendrickson, "Ants go marching: Insect discipline applied to military," The Baylor Lariat, December 1, 2010.

"According to Dr. Robert Marks, distinguished professor of electrical and computer engineering, there is increasing military interest in unmanned autonomous vehicles. A collection of vehicles can act like a swarm of insects, and Marks and his team are researching to find simple rules the vehicles can follow to enable the military to complete its mission.

" 'Dumb bugs do smart things,' Marks said. 'Bees build intricate hives. Ants build and defend anthills.' Marks explained how ants figure out how to get the Milky Way candy bar someone drops on the sidewalk back to their home by traveling the shortest distance, despite obstacles that prevent that path from being a straight line. 'Using the same algorithm we learn from ants, we can get messages, Milky Way bars, over communication paths to their destination using information packets, ants, in a very efficient way,' Marks said.

"Marks went on to say that social insects are robust and adaptive. He said that even if someone steps on half the ants taking the Milky Way bar to their home, the ants will still complete the task; it will just take longer. He said that ants are individually unaware of the overall task they are performing and they continue to follow their simple rules to complete their mission, without a master controller directing their every move. It is these simple rules that Marks and his team are trying to create for the military.

"Marks research stems from an idea he learned from his grandfather. 'My grandfather, who had a third-grade education, once told me that man has never done anything that God didnt do first,' Marks said. 'He is right. All of mans engineering designs can be found in nature.' "

276. William Dembski "New Peer-Reviewed Pro-ID Paper in BIO-COMPLEXITY," Uncommon Descent, December 15, 2010.

"A Vivisection of the ev Computer Organism: Identifying Sources of Active Information by George Montaez, Winston Ewert, William Dembski, Robert Marks"

"It is naively optimistic to think that Marks' appearance on the College Crunch list vindicates his research on Intelligent Design. Such optimism would be better justified if incoming Baylor president Ken Starr were to reinstate the Evolutionary Informatics Lab's website on the Baylor server and to recognize Intelligent Design as a legitimate area of research for Baylor faculty. That would constitute a true vindication of Marks' work on Intelligent

Design. It would also constitute a true validation of Starr's commitment to the full Baylor 2012 Vision."

277. Quinta-feira, "Uma vivessecção do organismo de computador ev: identificando as fontes de informação ativa." Desafiando a NOMENKLZASTURA CIENTÍFICA, December 16, 2010.

278. Bilbo "New Bio-Complexity Paper," Telic Thoughts, December 16, 2010.

279. Casey Luskin "BIO-Complexity Publishes Article Answering Critics Who Promote Tom Schneider's 'ev' Simulation," Evolution News & Science, December 23, 2010.

> "A new peer reviewed paper published in Bio-Complexity, "A Vivisection of the ev Computer Organism: Identifying Sources of Active Information," answers that question. Dembski and his coauthors have shown that, contrary to Miller's claim, the ev program is in fact rigged to produce a particular outcome, and that Stephen Meyer's description of ev is precisely correct.
>
> "According to the paper's authors, ev 'exploit[s] one or more sources of knowledge to make the search successful' and this knowledge 'predisposes the search towards its target.' They explain that Ken Miller's credulity towards ev was unwarranted"

280. Hallee the Homemaker, "Creation: Darwinian A Sunday guest post by my brilliant husband, Gregg," Evolutionary Frauds Pt. XVII, December 26, 2010.

> "Five recent examples were interviewed in Ben Stein's documentary, Expelled.
>
> - Guillermo Gonzalez
> - Richard Sternberg
> - Caroline Crocker
> - Robert Marks
> - Michael Egnor
>
> "Dr. Robert Marks Ph. D., a tenured 'Distinguished Professor of Electrical and Computer Engineering,' endured what can only be described as nearly stentorian persecution at the hands of Baylor University. Marks' website about his research challenging Darwinism was permanently shut down by the Baylor administration, Baylor pressured Marks to cease his anti-Darwinist research, and Baylor as grant administrators even returned grant money given to Marks from a third party organization for the purpose of hiring research assistants to assist in his anti-Darwin lab work."

281. Casey Luskin, "William Dembski and Robert Marks Publish (Another) Peer-Reviewed Scientific Paper Supporting No Free Lunch Theorems," Evolution News & Science, December 28, 2010.

> "A peer-reviewed scientific paper published in 2010 by William Dembski and Robert Marks of the Evolutionary Informatics Lab supports no free lunch theorems. Published in Journal of Advanced Computational Intelligence and Intelligent Informatics and titled 'The Search for a Search: Measuring the Information Cost of Higher Level Search' "
>
> "Dembski and Marks thus argue that 'successful searches do not emerge spontaneously but need themselves to be discovered via a search.' However, without information about the target, the search for a search itself is still no better than a blind search"
>
> "The implication of course, is that without the ultimate input from an intelligent agent–active information–such searches will fail."

2011

282. David Klinghoffer, "No Peer-Reviewed Support for ID? Darwinists Talk to the Hand, Evolution News & Science, January 5, 2011.

> "Another peer-reviewed paper by Dembski and Marks in the Journal of Advanced Computational Intelligence and Intelligent Informatics joins the list of such publications coming out of the Evolutionary Informatics Lab. From the same source, led by computer scientists at Baylor University, comes a peer-reviewed journal article in BIO-Complexity, debunking a computer program supposed to simulate unguided evolution and widely hailed by Darwin apologists like Kenneth Miller. Finally, a paper in the International Journal of Design & Nature and Ecodynamics offers evidence that we live in an 'engineered world.' "

283. William Dembski, "Robert Marks interviewed by Tom Woodward," Uncommon Descent, January 22, 2011. [

284. Podcast]

285. David Klinghoffer "The Universe Is Haunted: Reflections on the 'Nature of Nature'," Evolution News & Science, March 18, 2011.

> "The Nature of Nature [is] a massive and massively learned new 900-page volume of essays. In chapter after chapter, proponents and critics of naturalism and Darwinism, scientists and philosophers, hammer away at each other at the highest levels of debate."
>
> "Writing with Baylor University's Robert Marks, a pioneer in the field of computational intelligence, William Dembski states a fundamental law of nature that explains why, if undirected by an intelligent agent, the inscribing of biological information in the genome should face such impossibly daunting obstacles.

> "Stanford mathematician Keith Devlin has suggested that information may be 'a basic property of the universe, alongside matter and energy (and ultimately interconvertible with them).' The Law of Conservation of Information, formulated by Dembski and Marks, says as much in formal terms, holding that information can only be imported into a natural system and shuffled around. Where we find information erupting, as in the genome, much as when we find matter or energy popping into existence at the Big Bang, it must have been seeded there from outside."
>
> "Dembski and Marks define the generation of information as the act of eliminating possibilities. To illustrate, they give the example of formulating a sentence of prose. That task involves sifting the vast space of possible combinations of letters, almost all of them meaningless gibberish, for a combination that yields not only meaning but the meaning you intend."

286. Katherine T. Phan, "Texas Bill Would Protect College Professors Who Question Evolution," The Christina Post, March 19, 2011.

> "A new Texas bill would make it illegal for colleges to fire or refuse jobs to professors based on their research on intelligent design or other theories on the origin of life that question evolution."
>
> "In 2007, Baylor University shut down an evolutionary informatics lab by professor Robert Marks after administrators learned he was doing pro-ID research. The lab was forced to move from the university server to a third-party server. The incident was documented in Ben Stein's 'Expelled: No Intelligence Allowed.' "
>
> "HB 2454 requires a two-thirds vote to pass in the House."

287. Claire Berlinski, "Great Expectations: Information Theory and the Maverick Rabbi," *Ricochet*, June 17, 2011. [YouTube video: https://youtu.be/Uc6Ktq0SEB].

288. Paul Benedict, "A Scientific Consensus: Darwinism is Dead," Nolan Chart, July 2, 2011.

289. "From a very discreet conference, offering some frank takes on the bankrupt public Darwin cult," Uncommon Descent, July 5, 2011.

> "Some participants were flagged down at the airport afterward. Here are some great interviews (vid) at Ricochet (Claire Berlinski, editor), a 'secret' conference of prominent idea people who are fed up with the cult. These feature Robert Marks and Rabbi Moshe Averick.
>
> "Robert Marks is a professor of engineering at Baylor University, who decided to inquire into the holiness of one of Darwin's relics, the computer programs that supposedly prove him right. For that purpose, he founded the Evolutionary Informatics Lab. Marks' dean got wind of it and, on his own initiative, removed the Lab from the university servers, amid howls of glee from the faithful. Here's a reflection on that event: 'The Great Escape: A Tribute to Bob Marks.' "

"TheChortle.com on the Cambrian Explosion," Uncommon Descent, July 22, 2011.

> "Designed to amuse, TheChortle.com has a number of images related to evolution. Here's one of the more recent."

290. "Marilee Marks joins Re-Max" RE/MAX of Texas, September 30, 2011.

291. Natalee Blanchat "The God Dialogues: Christianity is for thinking people and is a reasonable, logical faith," The Battalion (Texas A&M Paper), October 27, 2011. [Newspaper], [YouTube: https://youtu.be/APW8sqWI96E], [Video Excerpts]

> "The God Dialogues: A moderated panel discussion between Christians, Atheists, and Muslims at 8 p.m. Thursday in Rudder 601.
>
> "Representing Ratio Christi and Christianity will be John Ferrer and Dr. Robert Marks; Representing the Atheist and Agnostic Student Group will be Shawn Hanrahan and Abid Mujtaba, and representing the Islamic Study Group will be Emad Mousavi and Shima Mohajeri."

2012

292. "Information: What Is it?," Evolution News & Science, January 19, 2012. [Youtube: https://youtu.be/d7seCcS_gPk], [Cache.]

293. johnnyb, "ID Metrics and an Active Information Tutorial," Uncommon Descent, January 20, 2012.

> "One of my favorite parts of ID is the fact that it is creating good tools for biologists to use. ID is often misconceived as a conclusion about whether or not X was designed. Instead, ID presupposes only the *possibility* that something was designed, and that intelligent agents are not mechanistic. In accordance with this, several metrics have been developed."
>
> "The third metric, however, is my favorite. It's a simpler conception, yet very powerful, and is based directly on the No Free Lunch theorems. It is 'Active Information'. Active Information is basically the measurement of how much information a search algorithm knows about the pattern of the search space that it is searching. It is measured by looking at the performance of the search algorithm vs a blind search. The paper describing it is here. This concept has been further applied to measure the amount of active information that is used by the immune system during somatic hypermutation (about 22 bits), and additional research is ongoing to apply it more generally to cells in hypermutable states.
>
> "Anyway, Active Information has a huge potential in biology to help detect which processes have frontloaded information, and how much information the cell is actually supplying for mutational processes. Anyway, below, Robert Marks gives a *great* lecture on information generally, and ends the lecture specifically talking about Active Information in evolutionary systems."

294. "William Dembski Interview," The Best Schools, January 23, 2012

> "...we are not denying that natural selection operates. Indeed, it does. But we are denying that its range and power are anything like what the Darwinists claim. And the evidence, we would contend, is all on our side. This is probably not the place to rehearse such arguments. I refer readers to The Design of Life. I would also refer readers to an article I coauthored with Bob Marks entitled 'Life's Conservation Law: Why Darwinian Evolution Cannot Create Biological Information.' This paper can be found in The Nature of Nature anthology..."

295. "PEER-REVIEWED & PEER-EDITED SCIENTIFIC PUBLICATIONS SUPPORTING THE THEORY OF INTELLIGENT DESIGN (ANNOTATED)," Evolution News & Science, February 1, 2012.

296. Podcast - William Dembski interview "Peer-Reviewed Scientific Literature Building a Compelling Case for ID," ID the Future, February 3, 2012

297. Mario A. Lopez "Dr. Robert Marks, A Scientist Who Questions the Evolution Consensus," American Institute for Technology and Science Education, February 4, 2012.

> "According to a popular blog, AITSE Consortium member 'Robert Marks has built a career establishing his credibility as a foremost thinker and researcher on the topic of computational intelligence. He has amassed an enviable publication record and huge set of government research grants. No one can question his scientific bona fides. And now, with his Evolutionary Informatics Lab (www.evoinfo.org), he is going for broke to establish intelligent design as a scientific research program. Just as Darwin made it possible to be an intellectually fulfilled evolutionist, so Robert Marks is making it possible to be an intellectually fulfilled [intelligent] design theorist.' And AITSE believes he does so with integrity."

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299. "Bill Dembski on the Evolutionary Informatics Lab the one a Baylor dean tried to shut down," Uncommon Descent, February 17, 2012.

300. Barry Arrington, "Barr v. Arrington," Uncommon Descent, February 27, 2012.

> "Over at the First Things blog Stephen Barr said that there is no way to compute the probabilities of evolution.
>
> "I disagreed and pointed him to Dembski's and Marks' work at the Evolutionary Informatics Lab. Barr responded by citing a 2003 article by Wesley Elsberry and said the critique of Dembski's work was, if valid, 'very damaging.'
>
> "I responded by pointing out that the Dembski/Marks article to which I had linked was from 2009 and therefore it was not possible for Elsberry to have critiqued it in 2003. Here's where things got interesting. Instead of allowing my response through, the FT moderator deleted it."

301. N'yjustu athugasemdir, "Ritrýndar greinar sem styoja Vitræna hönnun," Mofa Blog, March 4, 2012.

302. Doug Axe, "Applied Darwinism: A New Paper from Bob Marks and His Team, in BIO-Complexity," Evolution News & Science, April 4, 2012.

303. "Memo to physicist David Thomas: Make Darwinism work. Get an intelligent agent involved," Uncommon Descent, May 5, 2012.

> ""Heck, Dave will do. Who are we to be fussy?
>
> "Physicist/mathematician David Thomas has boasted that evolution creates information and that he can show this by solving the Steiner tree problem using its powers.
>
> "Steiner tree problem: To connect 5 (or whatever) cities with roads using the shortest combined road length.
>
> "Thomas has challenged,
>
>> "If you contend that this algorithm works only by sneaking in the answer (the Steiner shape) into the fitness test, please identify the precise code snippet where this frontloading is being performed."
>
> "The guys at Evolutionary Informatics Lab (the one the Baylor dean tried to can years ago, remember?) do exactly that:
>
>> "The precise code snippet where this frontloading is being performed' from Thomas's Fortran version of the program is shown below. It ensures that there are at least two interchanges (Thomas calls them variable points) during the initialization of the population:
>> NPV = INT(RNDVAL*FLOAT(NVMX-1))+2 ! MINIMUM 2 VARIABLE POINT"
>
> "Robert J Marks II comments: 'In fact, we show the problem attacked by Thomas is pretty lame in comparison with other Steiner tree solutions in the literature.' "

304. William Dembski "Is Darwinism Theologically Neutral? A Reply to Darrel Falk," Evolution News & Science, May 9, 2012.

> "As I've argued with Robert Marks in a paper titled 'Life's Conservation Law,' even if life is the result of an evolutionary process driven by natural selection, it would have to be a form of selection finely tuned by an environment that is itself finely tuned (see our contribution to The Nature of Nature, edited by Bruce Gordon and me)."

305. William A. Dembski "Conservation of Information Made Simple," Evolution News & Science, August 28, 2012.

> "Conservation of information, as the idea is being developed and gaining currency in the intelligent design community, is principally the work of Bob Marks and myself, along with several of Bob's students at Baylor (see the publications page at www.evoinfo.org). Conservation of information, as we use the term, applies to search. Now search may seem like a fairly restricted topic. Unlike conservation of energy, which applies at all scales and dimensions of the universe, conservation of information, in focusing on search, may seem to have only limited physical significance. But in fact, conservation of information is deeply embedded in the fabric of nature, and the term does not misrepresent its own importance."
>
> "For a "Made Simple" paper on conservation of information, this is about as much as I want to say regarding a precise statement of conservation of information. Bob Marks and I have proved several technical conservation of information theorems (see the publications page at www.evoinfo.org)."

306. "Kahler- Marks Wedding," Waco Tribune, September 23, 2012.

> "Kristopher Thomas Kahler and Marilee Melodie Marks were united in marriage on June 16, 2012, at the Marks River Ranch in McGregor. Pastor Craig Ferrell officiated."

307. Ratio Christi "God the Mathematician," (flyer), Texas A&M, October 5, 2012.

308. Marilee Marks, "Marilee's Take on Waco," November 2012, The Real Estate Insider, November 2012.

309. Sarvesh Kaslay "Intelligent design advocate blends faith, science," The Texas A&M Battalion, November 6, 2012

> "The Texas A&M chapter of Ratio Christi aims to strengthen the faith of Christian students at secular institutions nationwide through the use of intellectual investigation and apologetics.
>
> Ratio Christi Latin for 'the reason of Christ' is a global movement that aims to give university students and faculty historical, philosophical and scientific reasons for believing the Christian faith.

"As part of the Science and Faith Speaker Series, Ratio Christi is bringing Robert Marks to help shed light on the connection between God and mathematics with his speech titled, 'God Ever Geometrizes.'

" 'Dr. Marks will provide mathematical proof about the existence of God,' said Jayson Pilosi, chapter director of Ratio Christi at Texas A&M. 'He will try to put across the point that mathematics and God are not in competition, rather they are actually hand in glove.'

Marks is a professor of electrical and computer engineering at Baylor University and a staunch advocate of intelligent design. He has written more than 300 peer-reviewed, technical publications and given several presentations on the relationship between science and faith.

'The reason Ratio Christi chose Dr. Marks is because he is an incredibly gifted and talented individual,' Pilosi said. 'He is very good at making valid references that will help the audience connect to his message. He is good at putting cookies on the bottom shelf so that everyone can reach them.' "

310. Sarvesh Kaslay, "Apologetics speaker looks to prove God through math," The Texas A&M Battalion, November 8, 2012

"The quest to understand the existence of God is one that is largely driven by faith. The majority of the experts in science and its various branches have questioned the theist view of the universe.

"In a speech given on Tuesday by Robert Marks, professor of electrical and computer engineering at Baylor University, he put a spin on the clich and aimed to provide a rational, mathematical basis for establishing the presence of God.

"Ratio Christi, a global organization with the goal of re-establishing a strong and reasoned presence of Christian thinking in academia, invited Marks to give a speech titled 'God ever Geometrizes.'

" 'I was part of the inception of the lecture series and the speakers were already chosen when I jumped on the bandwagon,' said Lauren Simcic, president of the Texas A&M University chapter of Ratio Christi and junior political science major. 'But when I found out what this was about I felt it would make a huge difference on the campus.'

"Marks said the science fiction he read as a boy is boring compared to the mind-blowing mathematics of today's string theory and algorithmic information theory.

" 'These exciting results from mathematics I'll talk about demonstrate that God is awesome,' Marks said. 'Stephen Hawking famously said that any physics theory could never be proven. The best we can do is accumulate evidence. The same is true of proving God and the Lordship of Christ. Apologetics is all about gathering this evidence and Ratio Christi is all about scholarly apologetics. I'm presenting some apologetics viewpoint of mathematics.'

"Marks discussed the possibility of existence of multiple dimensions and that God may exist in one of the dimensions that humans are unable to perceive.

" 'Flatland' by Edwin A. Abbott was a book that made a great impact on me when I was a child,' Marks said. 'The beings in Flatland are all two dimensional, so the existence of a third dimension is oblivious to them. Similarly, there might be a four, five or infinite dimensions in our world but we might be completely unaware of them.'

"Marks also showed a video clip of an episode from 'The Twilight Zone,' a TV series in which a child falls through a portal to another dimension.

"Marks said a higher dimensional entity referred to as God can be infinitely close to humans without being visible, intersect the perceivable universe at will or even be able to see inside a person.

"Extolling the works of mathematicians such as Kurt Gödel and Georg Cantor, Marks discussed the mathematics involving infinite numbers.

" 'The presence of infinite numbers lead to absurdities such as the number of elements in an infinite set of counting numbers is equal to the number of elements in a set of infinite prime numbers,' Marsk said. 'Hence, the universe had to be created by a higher being who is unknowable because infinities lead to uncertainties which are not provable.'

"He also said there are things that are known to exist that will never be proven, citing Chaitin's constant.

" 'Chaitin's constant is a real number that informally represents the probability that a randomly constructed program will halt,' Marks said. 'But at the same time this number is uncomputable, since no halting probability is computable.'

"Julio Ramon, sophomore general studies major, said he found the lecture to be very helpful as it provided an objective view to spirituality.

" 'I am definitely going to look up most of the things that the speaker said in the lecture as the mathematical approach to faith was very interesting,' Julio said.

"The next speaker in line for the Ratio Christi Fall Lecture Series is Walter Bradley, dean of engineering at Baylor University. He will deliver a speech titled 'Is There Scientific Evidence for God?' on Nov. 19."

311. Duane A. Laverty, "WREATHS FROM HERBS," The Waco Tribune, November 11, 2012.

"Cathy Valentine (front) and Monica Marks, members of the Waco Herb Society, create wreaths from herbs during the club's meeting Tuesday at the Carleen Bright Arboretum in Woodway. Society members brought the herbs from their gardens to make the wreaths."

312. "New Paper in Bio-Complexity: 'Time and Information in Evolution," December 8, 2012.

"Readers may recall a paper published in 2010 by Wilf and Ewens. A rebuttal to that paper (authors Winston Ewert, William A. Dembski, Ann K. Gauger, Robert J. Marks II) has now been published in Bio-Complexity."

313. Denyse O'Leary "New paper: Was there really enough time for Darwinian evolution?" The Best Schools, December 8, 2012.

"In 'Time and Information in Evolution,' (BIO-Complexity, 2012), Winston Ewert, William A. Dembski, Ann K. Gauger, and Robert J. Marks II cast doubt on a mathematical model claiming to show that there was enough time for the Darwinian model of evolution"

314. Casey Luskin, "Peer-Reviewed Science: There Isn't Plenty of Time for Evolution'," Evolution News & Science, December 13, 2012.

"The Evolutionary Informatics Lab, headed by Drs. William Dembski and Robert J. Marks, II, has published a number of peer-reviewed scientific papers that assess supposed simulations of evolution. Their team developed a methodology for studying so-called 'genetic algorithms' – computer programs that are intended to simulate the Darwinian process. These programs incorporate 'active information,' which is essentially the amount of information smuggled into a search algorithm by an intelligent programmer to help it find a target. Their methodology calculates the amount of active information in a program, showing that intelligence – not Darwinian evolution – is what is finding the targets of these searches. In a new peer-reviewed scientific paper in the journal BIO-Complexity, 'Time and Information in Evolution,' Winston Ewert, Ann Gauger, along with Dembski and Marks, once again show that a mathematical simulation of evolution doesn't model biologically realistic processes of Darwinian evolution at all. First, a bit about the paper that Ewert et al. are responding to.

"The new paper responds to a 2010 paper in Proceedings of the U.S. National Academy of Sciences (PNAS) titled 'There's plenty of time for evolution,' by Herbert S. Wilf and Warren J. Ewens, a biologist and a mathematician at the University of Pennsylvania. There's little doubt that Wilf and Ewens intended their work to respond to the arguments of intelligent-design proponents. Though lacking any citations to ID literature, the paper's abstract starts off by stating, 'Objections to Darwinian evolution are often based on the time required to carry out the necessary mutations.' They then open the body of their paper by elaborating on these objections "

315. "Our Top 10 Evolution-Related Stories: #6, Peer-Reviewed Science Supports Intelligent Design," Evolution News & Science, December 27, 2012.

2013

316. "The 50 Smartest People of Faith," The Best Schools, January 7, 2013.

"The qualifications for inclusion on our list are twofold:

> (1) Intellectual brilliance, evidenced by a very high level of achievement, whether in the natural sciences, the social sciences, the humanities, literature, the fine arts, or public service; and
> (2) Religious faith, evidenced either through explicit personal witness or through publicly professed respect for religion.

"This list, then, includes living men and women who are both people of faith and people of exceptional intellectual brilliance and professional accomplishment. It is presented in alphabetical order."

"Marks was born in West Virginia. He was educated at the Rose-Hulman Institute of Technology (BS, Engineering, 1972; MS, Electrical Engineering, 1973) and Texas Tech (PhD, Electrical Engineering, 1977). He taught for many years at the University of Washington, in Seattle. He is currently Distinguished Professor of Electrical and Computer Engineering at Baylor University, in Waco, Texas. Marks, who is Protestant, has made a number of contributions to cutting-edge technology at the interface between electrical engineering and computer science. For example, in 1991 he was the first to apply artificial neural networks to the problem of forecasting power demands by electrical utility companiesa practice that is widespread today. More recently, Marks and colleagues developed an algorithm for the real-time tracking of the placement of radioactive seeds in prostate cancer therapy. In addition, his team developed the first closed-form solution for the NeymanPearson optimal detection of signals in non-Gaussian noise. In 2007, Marks inaugurated his Evolutionary Informatics Lab, a web site dedicated to simulating evolutionary processes. The Labwhich has demonstrated severe constraints on the creative potential of Darwinian-style algorithmswas afterwards shut down by the Baylor University administration, and Marks has since moved it to a private server."

317. Alumni News, Echoes (Rose-Hulman Institute of Technology), Spring 2013, Vol 2013, #2, April 4, 2013

> "Robert J. Marks II (EE; MSE 1973) was named one of the *50 Smartest People of Faith* by thebestschools.org."

318. William A. Dembski, "Before They've Even Seen Stephen Meyer's New Book, Darwinists Waste No Time in Criticizing Darwin's Doubt." Evolution News & Science, April 4, 2013.

> "But let's leave aside this direct response to Felsenstein (to which neither he nor Shallit ever replied). The fact is that conservation of information has since been reconceptualized and significantly expanded in its scope and power through my subsequent joint work with Baylor engineer Robert Marks. Conservation of information, in the form that Felsenstein is still dealing with, is taken from my 2002 book No Free Lunch. In 2005, Marks and I began

a research program for developing the concept of conservation of information, and we have since published a number of peer-reviewed papers in the technical literature on this topic (note that Felsenstein published his critique of my work with the National Center for Science Education, essentially in a newsletter format, and that Shallit's 2003 article finally appeared in 2011 with the philosophy of science journal Synthese, essentially unchanged in all those intervening years). Here are the two seminal papers on conservation of information that I've written with Robert Marks:..."

"So what's the take-home lesson? It is this: Stephen Meyer's grasp of conservation of information is up to date. His 2009 book Signature in the Cell devoted several chapters to the research by Marks and me on conservation of information, which in 2009 had been accepted for publication in the technical journals but had yet to be actually published."

319. Winston Ewert, "Information, Past and Present," Evolution News & Science, April 15, 2013.

"In addition, Felsenstein claims that 'The Search for a Search: Measuring the Information Cost of Higher Level Search,' by Dembski and Robert Marks, and related papers do not make an argument that the designer needed to intervene in the evolutionary process. This is true, but misunderstands the nature of the argument."

320. "William Dembski and the Intelligent Design Movement," GivingAnAnswer, April 20, 2013. [YouTube: https://youtu.be/MjTo-I8IkwQ]

321. Cornelius Hunter "Evolutionists Are Now Saying They Have Solved the Problem of Evolvability." Darwin's God, Thursday, May 2, 2013.

"Intelligent Design Theory - William Dembski, PhD," IDquest, May 2, 2013. [Youtube: https://youtu.be/VlQOEAOJhVM]

322. Denyse O'Leary "How does life incorporate information?" The Best Schools, June 5, 2013.

323. Denyse O'Leary "Download Cornell papers on origin of biological information free," Uncommon Descent, June 14, 2013.

324. Denyse O'Leary "Robert Marks of the Evo Info Lab on 'Information what is it?'," Uncommon Descent, June 29, 2013.

"As promised earlier today, here is the vid of Dr Marks on Information and search success:..."

325. Denyse O'Leary, "Open Mike: Cornell OBI ConferenceCan you answer these conundrums about information?" Uncommon Descent, June 29, 2013.

> "To facilitate discussion, we are publishing the abstracts of the 24 papers from the Cornell Conference on the Origin of Biological Information here at Uncommon Descent, with cumulative links to previous papers at the bottom of each page.
>
> "An excerpt from Introductory Comments by Robert J. Marks II for Section One, Information Theory & Biology:"

326. Denyse O'Leary "Open Mike: Cornell OBI ConferenceNew definition of information proposed: Universal Information," July 1, 2013.

327. Denyse O'Leary "Open Mike: Cornell OBI ConferenceChapter Three on the true cost of a successful searchConservation of information," Uncommon Descent, July 10, 2013.

328. Winston Ewert "Questioning Information Cost," Uncommon Descent, July 12, 2013.

329. Denyse O'Leary, "Open Mike: Cornell OBI ConferenceChapter Four: Pragmatic Information," Uncommon Descent, July 12, 2013.

330. "Denyse O'Leary, "Darwin sure plays a mean pin ball?" Uncommon Descent, July 14, 2013.

331. Denyse O'Leary "Open Mike: Cornell OBI ConferenceChapter Four, Pragmatic information: Conclusion." Uncommon Descent, July 16, 2013.

332. Biological Information: New Perspectives on Amazon.com, August 1, 2013.

333. Denyse O'Leary "ID guys' lasting fame: Their ErdosBacon number!" Uncommon Descent, August 3, 2013.

> "Robert Marks II, a computer science prof and ID theorist at Baylor, decided to have some fun with the Erdos number. The what? number? Well, let him tell it:
>
> > "In films, one's Bacon number is equal to the number of films you are removed from Kevin Bacon. It turns out that Kevin Bacon was in the movie Planes, Trains, and Automobiles. Ben Stein was also in that movie. This means that all of the intelligent design proponents or opponents that appeared in ExpelledExpelled have a Bacon number of two. This includes Bill Dembski, Paul Nelson, Doug Axe, Richard Sternberg, Guillermo Gonzalez, Caroline Crocker, Steve Meyer, Jonathan Wells, David Berlinski, Richard Dawkins, PZ Myers, Michael Ruse, yours truly, etc., etc.
> > "And so?
> > "Well, in science, technology, engineering, and mathematics there is the Erdos number, which is equal to the number of papers separating you from the eccentric mathematician Paul Erdos.
> > "I have a Erdos number of three. I published with Donald Wunch who published with Haraway who published with Erdos. This means

> that, since Bill Dembski and I have written a paper together, Bill has an Erdos number of at least four as do all of my fellow co-editors of the recently published Biological Information : Michael Behe, Bruce Gordon, John Sanford and Bill Dembski
> "Now here's where things get exciting!!!
> "One's Erdos-Bacon number is equal to the sum of your Erdos number and your Bacon number.
> "As documented, yours truly has an embarrassingly low ErdosBacon number of five. (I am considering having it engraved on my tomb stone.) Bill Dembski has an ErdosBacon number of six. This is also the ErdosBacon number for Carl Sagan! "
>
> (It's also the ErdosBacon number for Danica McKellar who played Winnie Cooper in The Wonder Years.)"

334. FMS Foundation "Scientific Proceedings Published, Challenging Conventional Neo-Darwinian Theory," Herald Online (South Carolina), August 12, 2013.

> "WACO, Texas, Aug. 12, 2013 /PRNewswire-USNewswire/ – World Scientific Publishing has just released the proceedings of a symposium held in the spring of 2011, where a diverse group of scientists gathered at Cornell University to critically re-examine neo-Darwinian theory. This symposium brought together experts in information theory, computer science, numerical simulation, thermodynamics, evolutionary theory, whole organism biology, developmental biology, molecular biology, genetics, physics, biophysics, mathematics, and linguistics."
>
> "For more information contact Dr. Robert Marks at Baylor University"

335. Casey Luskin "New Scientific Volume, Biological Information: New Perspectives, Challenges Neo-Darwinism, Survives Evolution Lobby's Attempt at Censorship," Evolution News & Science, August 16, 2013.

> "The volume Biological Information: New Perspectives is an interdisciplinary volume. For the most part, it comprises papers presented at the aforementioned Cornell conference. The papers are divided into four main sections. The first is on information theory and biology, and was edited by Robert J. Marks, Distinguished Professor of Electrical and Computer Engineering at Baylor University."

336. Springer signed a contract to publish *Biological Information: New Perspectives* but then reneged on the agreement. Here is the ad for the book on the Springer web site, August 18, 2013.

337. Casey Luskin, "On the Origin of the Controversy Over Biological Information: New Perspectives," Evolution News & Science, August 19, 2013.

> "Why did Springer first agree to publish the proceedings, and then later illegally cancel the book's publication contract?"

"Fall of 2009: Springer Invites William Dembski to Submit a Book Proposal"

"December 2010: 'Biological Information: New Perspectives Conference' Organizers Submit Book Proposal to Springer"

"February 2012: Darwin Lobby Mounts a Campaign to Scuttle the Book"

"March 1, 2012: Springer Makes False Claims about the Book in an Inside Higher Education Article"

"Conspiracy Theories Multiply on Evolution Blogs" "Though eager to paint the 'creationists' as evil, Elsberry's team didn't end up finding anything that showed wrongdoing, however imagined. But Elsberry's call to persecution led to all kinds of silly errands, such as digging up and quoting from Professor Robert Marks's wife's 2011 Christmas letter about their family's trip to Cornell University for the conference"

"March-December, 2012: Springer Stonewalls, Breaks Its Word, and Sets Up the Book for Failure"

338. Denyse O'Leary, "Open Mike: Cornell OBI Conference Chapter Five Abstract, William F. Basener's 'Limits of Chaos and Progress in Evolutionary Dynamics'," Uncommon Descent, July 19, 2013.

339. Denyse O'Leary, "Open Mike: Cornell OBI Conference Chapter Six Ewert et al on the Tierra evolution program," Uncommon Descent, August 5, 2013.

340. Denyse O'Leary "Open Mike: Cornell OBI Conference Chapter 7Probability of Beneficial MutationAbstract," Uncommon Descent, August 13, 2013.

"'Multiple Overlapping Genetic Codes Profoundly Reduce the Probability of Beneficial Mutation' by George Montañez, Robert J. Marks II, Jorge Fernandez, John C. Sanford"

341. Denyse O'Leary "Open Mike: Cornell OBI Conference Chapter 7Probability of Beneficial MutationConclusion," Uncommon Descent, August 13, 2013.

342. Denyse O'Leary "Open Mike: Cornell OBI Conference Chapter 8Entropy, Evolution and Open SystemsAbstract," Uncommon Descent, August 20, 2013.

343. Denyse O'Leary "Open Mike: Cornell OBI Conference Chapter 8Entropy, Evolution and Open SystemsAbstract," Uncommon Descent, August 20, 2013.

344. Denyse O'Leary "Open Mike: Cornell OBI Conference Chapter 9Information and Thermodynamics in Living SystemsAbstract," Uncommon Descent, August 21, 2013.

345. Denyse O'Leary "Open Mike: Cornell OBI Conference Chapter 9Information and Thermodynamics in Living SystemsConclusion," Uncommon Descent, August 21, 2013.

346. Casey Luskin "Biological Information New Perspectives Investigates 'Information Theory & Biology'," Evolution News & Science, August 21, 2013.

"The new scientific volume Biological Information: New Perspectives covers many topics related to the origin of information."

"One noteworthy paper in that section is by William Dembski, Winston Ewert, and Robert Marks, 'A General Theory of Information Cost Incurred by Successful Search.' It provides a general explanation of their methodology for measuring 'active information,' or the amount of information that is added to a random search to aid in finding a search target. This foundational paper is theoretical, aiming to establish mathematically that without active information being added, a search can perform, on average, no better than a random search"

"Ewert, Dembski, and Marks have a second paper in the volume titled "Tierra: The Character of Adaptation" where they apply the sort of methodology developed in their first paper. This study looks at Tierra, one of the earliest computerized simulations of evolution, developed by Thomas Ray in 1989."

"As Ewert, Dembski, and Marks explain, in Ray's mind "once evolution (whether biological or artificial) has produced a Cambrian explosion, the rest of evolution should proceed easily." They observe, however, that after 20+ years of people using Tierra, the widely agreed conclusion 'is that Tierra did not produce a Cambrian explosion or open-ended evolution.' They observe that 'Tierran evolution can be characterized as an initial period of high activity producing a number of novel adaptations followed by barren stasis,' and thus ask why Tierra stopped producing new features.

"The author of Tierra sought to create a digital Cambrian explosion whereby the power of the evolutionary process was unleashed. It is agreed that Tierra did not succeed in accomplishing this feat. Rather, the evolutionary activity within Tierra dies after only a transitory period. No Cambrian explosion occurs."

347. Casey Luskin "In BIO-Complexity and Biological Information: New Perspectives, Granville Sewell Defends his Arguments on the Second Law of Thermodynamics," Evolution News & Science, August 21, 2013.

348. Casey Luskin "In Biological Information: New Perspectives, Michael Behe finds Loss of Function Mutations Challenge the Darwinian Model," Evolution News & Science, August 24, 2013.

349. Denyse O'Leary "Open Mike: Cornell OBI Conference Chapter 10Biological Information and Genetic Theory: Introductory CommentsAbstract," Uncommon Descent, August 24, 2013.

350. Denyse O'Leary "Open Mike: Cornell OBI Conference Chapter 10Biological Information and Genetic Theory: Introductory CommentsExcerpt," Uncommon Descent, August 24, 2013.

351. Denyse O'Leary "Open Mike: Cornell OBI Conference Chapter 11Not Junk After All Abstract," Uncommon Descent, August 29, 2013.

352. Denyse O'Leary "Open Mike: Cornell OBI Conference Chapter 11Not Junk After AllConclusion," Uncommon Descent, August 29, 2013.

353. The Best Biological Books Reviews Guides and Tips "Biological Information: New Perspectives," November 21, 2013.

354. Dr. L. A.Yahaya "PERSONAL CHARACTERISTICS OF REPUTABLE SCHOLARS," University of Ilorin, Nigeria, November 22, 2013.

> "Academic profession like other essential professions has its demands. For anyone to succeed in the profession, he/ she needs to possess some personal characteristics. The focus of this presentation is to sensitize academic staff, particularly the young academics on the personal characteristics that are required to succeed in academic career. Some notable scholars who possessed the appropriate personality characteristics and that have excelled in academic endavour include: Fransisco Ayala, Abdulhamid Bin Badis, Ali Jabar, Abdul Qader Arnaoot, Peter L. Berger, Benjamin Carson, Hassan Hathont, Francis Collins, Omar Khalidi, Robert J. Marks."

355. "How come theists never get into peer-reviewed journals with their ideas and so called evidence?," Yahoo, December 12, 2013.

356. Casey Luskin "#7 of Our Top-Ten Evolution Stories of 2013: New Scientific Volume Challenges Neo-Darwinism, Survives Censorship Attempt," Evolution News & Science, December 26, 2013.

> "Biological Information: New Perspectives"

2014

357. "'Biological Information: New Perspectives' Web Site", January 1, 2014. [http://www.biologicalinformatic

> "Find out more about our latest scientific publication offering fresh new insights into the origin and nature of biological information!"

358. "Biological Information: New Perspectives" January 1, 2014. [Front], [Book], [Synopsis], [Editors], [Authors #1], [Authors #2], [Order], [Flyer].

359. Ann Gauger, "Biologic Perspectives: BIO-Complexity in Review," January 18, 2014.

360. Jason B. Ladd "Elegant Biology: New Perspectives For Your Information," Fighter Faith, January 23, 2014.

> "Biological Information: New Perspectives is the product of a 2011 symposium at Cornell University and explains the findings in 24 scientific papers by 29 scientists"

361. "The 50 Most Influential Scientists in the World Today," The Best Schools, February 2, 2014.

> "This article focuses on the 50 most influential scientists alive today and their profound contributions to science. These are scientists who have invented the Internet and fiber optics, challenged AIDS and cancer, developed new drugs, and in general made crucial advances in medicine, genetics, astronomy, ecology, physics, and computer programming.
>
> "In referring to the scientists on this list as "influential," this article attempts to gauge their influence on science as such. In other words, the scientists listed here are influential because of the groundbreaking scientific work they have done and its impact on the world.
>
> "Some scientists are enormously influential as popularizers or culture critics or public intellectuals. In this respect, figures like Richard Dawkins and Lawrence Krauss, or Carl Sagan and Stephen Jay Gould a generation back, come to mind. The scientists on this list, however, are here because of their preeminence as scientists doing science.
>
> "The scientists described here are all creative and brilliant. Many of them are also unusual and interestingcolorful personalities that it would be a pleasure to know!
>
> "As you feast on the names and biographies of the scientists on this list, also check out our article "The World's 50 Smartest Teenagers." Some of the most influential scientists in the future will be drawn from this list."
>
> Robert J. Marks II is the Distinguished Professor of Electrical and Computer Engineering at Baylor University in Waco, Texas. Previously, he was on the faculty of the University of Washington for 25 years. He is a pioneer in the field of computational intelligence (which includes neural networks, fuzzy sets, and evolutionary computing), and was the first president of the Institute of Electrical and Electronics Engineers (IEEE) Neural Networks Council.
>
>> [Robert J.] Marks received his PhD in electrical engineering from Texas Tech University. He has over 300 peer-reviewed journal publications. He is also a proponent of intelligent design, holding that certain features of the universe and of living things are best explained by an intelligent cause, not an undirected process such as natural selection.
>>
>> Marks has made important technical contributions across widely diverse areas, such as the spacing of radium inserts to treat prostate cancer, signal display, remote sensing, optical image sampling, optical computers, and the use of fuzzy logic to control the electrical grid (how electricity is delivered today depends crucially on the work of Marks). He has served as a consultant to companies such as Microsoft and Boeing corporation.
>>
>> Marks has authored several books including, the Handbook of Fourier

> Analysis and Its Applications, Neural Smithing: Supervised Learning in Feedforward Artificial Neural Networks, and Applications of Neural Networks to Power Systems, among others.
> Marks has received numerous awards, including the IEEE Distinguished Lecturer twice, once from the IEEE Neural Networks Council in 199192, and again from the IEEE Neural Networks Society in 200203, as well as the Golden Jubilee Medal in 1999 from the IEEE Circuits and Systems Society. He is a fellow of the IEEE.
> In 2007, Marks founded the Evolutionary Informatics Lab at Baylor to study the information-theoretic underpinnings of intelligent design. The research of that lab has produced a steady stream of peer-reviewed engineering publications that are influencing many in the engineering community to accept intelligent design, controversial though it remains, as a legitimate scientific theory.

362. Tara MacIsaac "Scientists With Controversial Views Speak of Blacklisting: How Free Is Science? 'Emotional reaction' from peers when a scientist breaks from conventional thinking," Epoch Times," February 11, 2014.

> "Prof. Robert J. Marks II at Baylor University had tenure before expressing a belief in intelligent design. He said 'I'm academically safe, but the young people, what has happened to them right now in America because of this scientific gulag is really terrible.' "

363. Casey Luskin "Cosmos with Neil deGrasse Tyson: Same Old Product, Bright New Packaging," Evolution News & Science, March 10, 2014.

364. DENYSE O'LEARY, "Why would anyone want to understand information theory?" CONNECTING; Negotiating the Virtual World, TUESDAY, 1 APRIL 2014.

> "To be thought a geek? To actually be a geek?
>
> "To understand new media better? How about because information, not matter, may be the basic substance of reality. Sound implausible? Read on. Consider the following questions, asked by Baylor University computer science prof Robert Marks II:
>
> > "When a paper document is shredded, is information being destroyed? Does it matter whether the shredded document is a copy of an un-shredded document and can be replaced?
> > "Likewise, when a digital picture is taken, is digital information being created or merely captured?
> > "The information on a DVD can be measured in bits. Does the amount of information differ if the DVD contains the movie Braveheart or a collection of randomly generated digital noise?
> > "When a human dies, is experiential information lost? If so, can birth and experience create information?

> "If you are shown a document written in Japanese, does the document contain information whether or not you know Japanese? What if, instead, the document is written in an alien language unknowable to man?"

"The purpose of such questions is to help us see that information is real even though it is immaterial. One consequence of information being immaterial is that it is not measured in any way commensurate with material nature."

365. Casey Luskin "BIO-Complexity Paper: Why Chaitin's Mathematical 'Proof' of Darwinian Evolution Fails," Evolution News & Science, April 7, 2014.

"A new peer-reviewed paper in BIO-Complexity, 'Active Information in Metabiology,' reports on the further investigations of the Evolutionary Informatics Lab into the ability of unguided evolutionary mechanisms to produce new information. This time, authors Winston Ewert, William Dembski, and Robert Marks show that the budding field of metabiology only produces creative outputs through active information – i.e., informational inputs donated by an intelligent source – and does not truly demonstrate that unguided processes can produce new information."

366. iz quotes, April 9, 2014.

"Science packages theory, places it on a throne, and honors and protects it much like a queen. Engineers make the queen come down from the throne and scrub the floor. And if she doesn't work, we fire her. Robert J. Marks II."

367. "erdos bacon number," SensAgent, April 10, 2014.

"A person's ErdÖsBacon number is the sum of one's ErdÖs numberwhich measures the 'collaborative distance' in authoring mathematical papers between that person and Hungarian mathematician Paul ErdÖsand one's Bacon numberwhich represents the number of links, through roles in films, by which the individual is separated from American actor Kevin Bacon. The lower the number, the closer a person is to ErdÖs and Bacon, and this reflects a small world phenomenon in academia and entertainment."

"Electrical engineer Robert J. Marks II appeared in Ben Stein's movie Expelled: No Intelligence Allowed. Stein appeared with Bacon in Planes, Trains and Automobiles giving Marks a Bacon number of two. Marks has published with Donald C. Wunch II [24] who published with Frank Harary [25] who has coauthored with ErdÖs. Marks therefore has an ErdÖs number of three and ErdÖsBacon number of five."

368. Lambert M. S. (Russia) "Robert J. Marks II," Bookin.org.Ru, April 10, 2014.

"Marks has over 300 peer-reviewed technical publications, and is a fellow of the IEEE and the Optical Society of America. An old earth creationist, he

is a subject of the 2008 pro-intelligent design motion picture, Expelled: He was the first president of the Institute of Electrical and Electronics Engineers (IEEE) Neural Networks Council (now the IEEE Computational Intelligence Society) and the editor-in-chief of the IEEE Transactions on Neural Networks. Robert Jackson Marks II is a Distinguished Professor of Electrical and Computer Engineering at Baylor University and proponent of intelligent design. Please note that the content of this book primarily consists of articles available from Wikipedia or other free sources online. From 1977 to 2003, he was on the faculty of the University of Washington in Seattle. No Intelligence Allowed. In 2010, he was named as one of the twenty most brilliant living Christian professors."

369. "20 Most Influential Christian Thinkers," Learn Something, April 10, 2014.

    "(Brainz) – This is a list of the most influential Christian thinkers in the world today. Thinkers who have shaped Western civilization and sometimes the practice of Christianity itself."

370. Popstar.com "Robert J. Marks II," April 10, 2014.

371. Texas Tech University "Electrical & Computing Engineering Academy Members," April 10, 2014.

372. yQuotes, "Robert J. Marks quotes," April 10, 2014.

    "Computers are no more able to create information than iPods are capable of creating music."

    "Is it wrong to pray for God to make me more successful so that I can be more humble?"

    "Saying the Bible is not a book about science is like saying a cookbook is not a book about chemistry."

373. Ratio Christi, "PERSONAL PROFILE, Robert J. Marks, II," April 10, 2014.

374. Casey Luskin "FAQ: Does Intelligent Design Help Science Generate New Knowledge?," IDEA (Intelligent Design and Evolution Awareness Center), April 10, 2014.

    "Below are about a dozen or so examples of areas where ID is helping science to generate new knowledge."

    "ID has inspired theoretical research into the information-generative powers of Darwinian searches, leading to the finding that the search abilities of Darwinian processes are limited, which has practical implications for the viability of using genetic algorithms to solve problems. See: William A. Dembski and Robert J. Marks II"

375. Casey Luskin, "Intelligent Design's Utility Is Highlighted in a New Volume, Engineering and the Ultimate," Evolution News & Science, April 21, 2014.

> "A 2012 conference at Oral Roberts University, 'Engineering and Metaphysics,' explored how the fields of engineering, mathematics, and computing can contribute to answering scientific questions, including those pertaining to cosmic and biological origins."
>
> "Chapter 7, 'Algorithmic Specified Complexity,' is authored by a familiar team of writers – Winston Ewert, William Dembski, and Robert Marks. They explain that the classical method of detecting design seeks to find complexity and specified information (CSI) in nature. As the authors of this paper write, 'Complexity refers essentially to improbability,' and specification is defined as 'conforming to an independently given pattern.' "

376. William A. Dembski "Politically Correct and Politically Incorrect Careers," The Best Schools, April 27, 2014.

377. Casey Luskin, "Winston Ewert: Irreducible Complexity Remains Unrefuted," ID the Future, YouTube Video, May 17, 2014. [YouTube: https://youtu.be/OMz9HrP0AYM].

378. "Intelligent Design in Action: Informatics," Evolution News & Science, June 2, 2014.

379. Brian Thomas, M.S "Powerhouse of Scientists Refute Evolution, Part One," Institute for Creation Research, June 13, 2014.

> "In 2011, the 'Biological Information: New Perspectives' conference was held in which 29 leading design scientists technically assessed critical aspects of Neo-Darwinian theory."

380. Brian Thomas, M.S "Powerhouse of Scientists Refute Evolution, Part Two," Institute for Creation Research, June 16, 2014.

> "In one paper, Dr. Ewert, an electrical and computer engineer, along with mathematician and philosopher William Dembski and computer engineer Robert Marks II, showed that Tierra failed to evolve information in computer simulations, even though its programmer placed unrealistic, evolution-friendly parameters into the software."

381. Brian Thomas, M.S "Powerhouse of Scientists Refute Evolution, Part Three," Institute for Creation Research, June 16, 2014.

382. YouTube: "Powerhouse of Scientists Refute Evolution," June 20, 2014.

383. Matt Webster "Calorie Counting Made Easy," July 7, 2014.

> "A few years ago I asked my wife if she would like an activity monitor for her birthday, to help automatically track her calories. To my surprise she answered, 'Does it automatically track the calories I eat?' I told her that that was crazy and not possible. She replied, 'Then I don't want it!' "

> "We are developing advanced sensor technology to make estimation of dietary calories in food as simple as the touch of a button."
>
> "Our team at GE and our collaborators at Baylor University's Electrical & Computer Engineering Department have found calorie estimation to be possible in principle, putting together devices to measure calories in different mixtures of oil, water and sugar."

384. Erik J. Larson "Eugene Goostman Is a Fraud," Evolution News & Science, July 9, 2014. [Link.]

385. Time Out Contributers "The 100 best sci-fi movies: scientists," TIME OUT, July 22, 2014.

> "Leading sci-fi experts, filmmakers, science fiction writers, film critics and scientists pick the best sci-fi movies ever made." "Professor Robert J Marks II
>
> (a) AI Artificial Intelligence
> (b) Invasion of the Body Snatchers
> (c) The Matrix
> (d) The Terminator
> (e) Predator
> (f) Dr Jekyll and Mr Hyde (1931)
> (g) Brazil
> (h) 2001: A Space Odyssey
> (i) Blade Runner
> (j) The Thing From Another World
>
> "Robert J Marks II is currently the distinguished professor of electrical and computer engineering at Baylor University in Waco, Texas."

'

386. 'A calorie-counting microwave? GE is working with Baylor on the concept," Baylor Proud, August 5, 2014.

> "It feels like something from The Jetsons or Star Trek, but it's much closer to reality than to TV Land.
>
> "A team from GE, working with faculty and students from Baylor's Electrical and Computer Engineering Department, are moving towards a push-button device that could, in an instant, tell you just how many calories are on your plate."

387. David Klinghoffer "Video: Robert Marks Speaking to the American Scientific Affiliation on 'Algorithmic Specified Complexity'," Evolution News & Science, August 8, 2014.

388. David Klinghoffer, "Biological Information: How Do You Explain the Origin of Something That's So Tough Even to Define?" Evolution News & Science, August 21, 2014.

> "That's the implicit question raised by our friend and Baylor University electrical and computer engineering Distinguished Professor Robert Marks. Writing at Human Events, Marks describes the 2011 conference at Cornell that became the basis of a controversial collection of papers, Biological Information: New Perspectives"

REGINA DENNIS, "GE, Baylor partner to develop calorie-counting machine," Waco Tribune-Herald, August 24, 2014.

> "Figuring out the number of calories in a meal could soon become as simple as pushing a button, thanks to a new calorie-counter machine GE is developing with Baylor University."
>
> "Robert Marks, distinguished professor of electrical and computer engineering at Baylor, has assisted in analyzing the data from the test trials of the liquid mixtures for the calorie machine. Hundreds of trials were conducted to fine-tune the methodology and ensure that the results would remain consistent with repeated demonstrations. 'Its significant (research) because of the obesity epidemic, Marks said. Hopefully with one of these calorie counters and some self-discipline and some exercise, that sort of thing can be addressed; thats what were hoping. And I know that theres a demand, because my wife said, 'I want one! I want to buy the first one!' "

389. Abigail Loop "Baylor students, faculty engineer a healthier America," Baylor Lariat Newspaper, August 25, 2014.

> "Counting calories in a meal will soon happen with a push of a button.
>
> "Faculty members from Baylor's Electrical and Computer Engineering Department, along with a team of undergraduate and graduate students, are in the process of developing a microwave-like device that will display the number of calories in a meal on a plate.
>
> "Drs. Randall Jean and Robert Marks, Baylor engineer professors who are the lead researchers for the project, are also working alongside a team from researchers from General Electric's global research team."
>
> " 'Right now we have some preliminary data,' Marks said. 'When you do research of this sort, you look for proof of principle. You want to see if it works and get the problem down to the simplest form. The proof of principle has worked out splendidly.'
>
> "Marks said eventually they would like to achieve something user friendly that could be put on a plate.
>
> "Marks said the research team is hoping that not only will this product be innovative for the Baylor engineering department and GE, but that it will also encourage healthier eating.

> "With America's rising obesity rate, this product is needed more than ever, Marks said.
>
> " 'America is fat,' he said. 'These people are really ill. If they had one of these calorie counters and exercise, they could solve it. I see this possibly being a solution to the obesity epidemic.' "

390. "Frequently Asked Questions," Evolution News & Science, September 6, 2014

> "Are there established scholars in the scientific community who support intelligent design?
>
> "Yes. Intelligent design theory is supported by doctoral scientists, researchers, and theorists at a number of universities, colleges, and research institutes around the world... Research centers for intelligent design include the Evolutionary Informatics Lab, led by Robert Marks, Distinguished Professor of Engineering at Baylor University "

391. "Peer-Reviewed Articles Supporting Intelligent Design," Evolution News & Science, September 6, 2014.

392. "Robert Marks on probability and random processes," Uncommon Descent, September 15, 2014.

393. Ken Ammi " 'Biological Information: New Perspectives' and blacklisting scientists," True Freethinker, September 17, 2014.

> "A fracas has ensued regarding an already peer reviewed book which was due to be published by Springer, an 1International Science, Technology, Medicine' publisher...
>
> "This is all in regards to the book Biological Information: New Perspectives which is being condemned, without having been read, as a book of Creationism or Intelligent Design disguised as a book about science. This is why the Orthodox Darwinists are blacklisting it and its editors."

394. "The Impact of Christian Faith on Mathematics & Science: Yesterday & Today" Flyer, September 29, 2014.

395. "How come theists never get into peer-reviewed journals with their ideas and so called evidence?" Yahoo,September 30, 2014.

396. Jason B. Ladd "Ratio Christi: Bringing Students Back to Life," Ratio Christi, September 30, 2014.

> "If you've never heard of Ratio Christi, you will."
>
> "Speakers included:... Robert J. Marks, II - Distinguished Professor of Engineering in the Department of Engineering at Baylor University, consultant for Microsoft Corporation, Pacific Gas & Electric, and Boeing Computer Services, co-editor of Biological information :New Perspectives."

397. "Who is Robert J. Marks II?" Biography, Gossip, Facts, September 30, 2014

> "What is Robert J. Marks II's horoscope?
> "Is Robert J. Marks II's gay or straight?
> "Are there any photos of Robert J. Marks II's hairstyle or shirtless?
> "Is Robert J. Marks II still alive?
> "Is Robert J. Marks II hot or not?
> "Does Robert J. Marks II do drugs?
> "What is Robert J. Marks II's net worth?"

398. "Robert J Marks" OPINION ENCYCLOPEDIA, September 30, 2014.

399. About "Robert J. Marks II," September 30, 2014.

400. William A. Dembski, "Responding to My Talk at the University of Chicago, Joe Felsenstein's Argument by Misdirection," Evolution News & Science, October 7, 2014.

> "Actually, in my talk, I work off of three papers, the last of which Felsenstein fails to cite and which is the most general, avoiding the assumption of uniform probability to which Felsenstein objects. That paper is William A. Dembski, Winston Ewert, and Robert J. Marks II, 'A General Theory of Information Cost Incurred by Successful Search,' in Marks et al., eds., Biological Information: New Perspectives (Singapore: World Scientific, 2013)."
>
> "Felsenstein is perhaps a quarter right here. Marks and I do think that insofar as evolutionary processes produce specified complexity, this is ultimately due to a designer fine-tuning the evolutionary process. But our actual work on Conservation of Information only shows that any evolutionary theory is necessarily incomplete and cannot account for the creation of the information that the evolutionary processes limned by the theory supposedly outputs."

401. Denyse O'Leary, "Immaterial Evidence The Law of Conservation of Information: Part I," SALVO, October 10, 2014.

> "Robert Marks II and his students at Baylor University in Texas have developed the idea in terms of 'search,' and their approach has profound consequences for plausible ideas of how evolution occurs, especially when vast claims are made for WEASEL and other "evolution" computer programs."

402. Denyse O'Leary, "Shoutout to Tom English: How much of the animus you display against Marks and Dembski is scholarly?" Uncommon Descent, October 13, 2014.

> "Dr. English has been subject to a number of disciplinary actions at Wikipedia for attempted edits to the bio entry for Marks."

403. Casey Luskin, "How Can We Positively Test Intelligent Design?" IDEA, October 18, 2014.

404. Denyse O'Leary, "Bob Marks on apologetics," Uncommon Descent, October 19, 2014.

> "You remember him, right?
>
> "See, it's true that a lot of these ID people ARE Christians (ghost jumps out of sheet, whoooshes past everybody. Gee wow. Did something happen and I never knew it?)"

405. Eugene Selensky, "LIVING ORGANISMS AS DECISION-MAKING SYSTEMS," (Translated from Russian), October 19, 2014.

406. Casey Luskin, "The College Student's Back To School Guide to Intelligent Design," Evolution News & Science, October 19, 2014.

2015

407. O'Leary "Podcast: Winston Ewert on computer simulation of evolution (AVIDA) that sneaks in information." Uncommon Descent, February 6, 2015.

408. O'Leary "Robert Marks, answering a facet of the War between Science and [Christian] Religion thesis," Uncommon Descent, March 15, 2015.

409. Johnny B. "Signal to Noise: A Critical Analysis of Active Information," Uncommon Descent, April 23, 2015.

410. Winston Ewert, "These Critics of Intelligent Design Agree with Us More Than They Seem to Realize." Evolution News & Science, April 27, 2015.

> "Joe Felsenstein and Tom English have written a post, 'Fitness surfaces and searches: Dembski, Ewert, and Marks's search for design.' That is in reply to William Dembski's article at ENV, "Responding to My Talk at the University of Chicago, Joe Felsenstein's Argument by Misdirection," which in turn was a response to another post by Felsentein at Panda's Thumb, 'Dembski's argument in Chicago – New? Persuasive?' The discussion concerns conservation of information, including active information and search for the search – ideas developed by William Dembski, Robert Marks, and myself at the Evolutionary Informatics Lab. Felsentein (University of Washington geneticist) and English (identified on his blog as a computer scientist in Oklahoma City) raise a number of objections. However, their objections are directed against an argument we do not make. In fact, regarding the conclusion of conservation of information, they are in agreement with us."

411. Winston Ewert "Aurelio Smith's Analysis of Active Information," Uncommon Descent, April 30, 2015.

412. kairosfocus "On Active Information, search, Islands of Function and FSCO/I," Uncommon Descent, May 5, 2015.

413. William A. Dembski "A Design-Theorist's Brief Guide to Rupert Sheldrake," Evolution News & Science, May 12, 2015.

414. "Any Sufficiently Vacuous Evolutionary Explanation Is Indistinguishable from Magic," Evolution News & Science, May 18, 2015.

415. "Evolutionary Computing: The Invisible Hand of Intelligence," Evolution News & Science, June 17, 2015.

> "Darwinian evolution is characterized by an utter lack of guidance; it is the 'blind watchmaker'of Dawkins. It doesn't know where it's going."
>
> "William Dembski and Robert Marks have shown that no evolutionary algorithm is superior to blind search – unless information is added from an intelligent cause, which means it is not, in the Darwinian sense, an evolutionary algorithm after all. This mathematically proven law, based on the accepted No Free Lunch Theorems, seems to be lost on the champions of evolutionary computing. Researchers keep confusing an evolutionary algorithm (a form of artificial selection) with "natural evolution."
>
> "There's no question that intelligently guided 'evolutionary computing' has been very successful at solving problems. Marks and Dembski can testify to that from work in their own Evolutionary Informatics Lab."
>
> "Marks and Dembski account for the invisible hand required in evolutionary computing."

416. Jonas E. Alexis, "David Duke, Eugenics, and the Aryan Vision,, Veterans Today, June 29, 2015.

> "In a previous article, I did say specifically that Zionism and Darwinism are arguably concentric circles."
>
> "Another point that needs to be discussed quite briefly here is that Darwin's grand theory (what is now called macro-evolution) is much more philosophical and political than scientific. Many scientists have been fired for simply mentioning that macro-evolution does not provide a serious mechanism for life on earth."
>
> "Robert J. Marks II, Distinguished Professor of Engineering at Baylor University, was a tenured professor. Yet as soon as the university found out that he mentioned intelligent design in his website, the university immediately shut it down and asked him to return his grant money."

417. Casey Luskin, "Research by Dembski and Marks Makes Inroads in Technical Literature," Evolution News & Science, July 29, 2015.

> "Intelligent design is making unmistakable progress in mainstream scientific thinking. Here's an example from a new paper in the journal of Soft Computing, 'Heuristic algorithm based on molecules optimizing their geometry in a crystal to solve the problem of integer factorization.' It cites the work

of leading ID researchers William Dembski and Robert Marks of the Evolutionary Informatics Laboratory – quite favorably so, not in order to critique them."

418. Bill Leonard "The Scopes Trial, then and now," Baptist News Global, September 9, 2015.

419. Mario Lopez, "An Interview with Dr. William A. Dembski," IDEA, October 19, 2015.

> "With the formation of Robert Marks's Evolutionary Informatics Lab in June 2007 (Marks is a distinguished professor of electrical and computer engineering at Baylor University), and work by him and me on the conservation of information (several papers of which are available at http://www.EvoInfo.org), I think ID is finally in a position to challenge certain fundamental assumptions in the natural sciences about the nature and origin of information. This, I believe, will have a large impact on science."
>
> "Mind you, Robert Marks's title is Distinguished Professor of Electrical and Computer Engineeringhe doesn't just have tenure but he is (or was) a star professor at Baylor. In any case, Marks still remains at his university. Untenured faculty are not so fortunate."
>
> "...this work will be published as separate articles in collaboration with Robert Marks. I expect that eventually we will be co-authoring a monograph on this topic together, though we may not give it that title given the climate of hostility against ID."

420. "Robert J. Marks II Quotes" izQuotes, October 25, 2015.

> "Is it wrong to pray for God to make me more successful so that I can be more humble? "

421. "Robert J. Marks II," Goodreads, October 26, 2015.

422. "Robert J. Marks II," Project Gutenberg, October 29, 2015.

423. "Robert J Marks II Author Profile: Biography, Books and Appearance Information," All American Speakers, October 30, 2015.

424. "Robert J. Marks II Philosopher," Redirectify, Bio & Facts, October 30, 2015.

425. "Robert J. Marks II Quotes," AZ Quotes, October 30, 2015.

> "Saying the Bible is not a book about science is like saying a cookbook is not a book about chemistry."

426. "Robert J. Marks II," Freebase, October 31, 2015.

427. Sarah Chaffee, "ID Inquiry: Robert Marks on Information," ID the Future, November 2, 2015. [Audio], [YouTube: https://youtu.be/c2UCPX5mKio].

428. David Klinghoffer, "Listen: Robert J. Marks on 'Information,' and What Is It, Anyway?" Evolution News & Science, November 4, 2015. [Audio], [YouTube : https://youtu.be/c2UCPX5mK

> "'Information' is a key concept in arguments for intelligent design, but understanding what the term means in an ID context is not simple. Dr. Marks explains with his usual panache."

429. Winston Ewert, "Specified Complexity Like Déjà Vu All Over Again," Evolution News & Science, December 2, 2015.

> "Writing at the blogs Panda's Thumb and The Skeptical Zone, Joe Felsenstein (University of Washington geneticist) and Tom English (Oklahoma City computer scientist) have lately published three posts criticizing two arguments for intelligent design: specified complexity and conservation of information. However, their objections are based on misrepresentations of these arguments."

430. Winston Ewert, "What Does 'Life's Conservation Law' Actually Say?" Evolution News & Science, December 3, 2015.

> "In an earlier article at Evolution News ('These Critics of Intelligent Design Agree with Us More Than They Seem to Realize'), I emphasized that while the theorems of conservation of information show that active information must derive from a non-mechanistic source outside of the universe, this does not necessarily imply that the source was intelligent or even teleological."
>
> "In this passage, they [Dembski and Marks] argue for intelligent design on the basis of the conservation of information theorems. However, they do not say that the only possible account of active information is intelligence. Rather, they use words like 'suggests' and 'evokes.' If Dembski and Marks thought that they had a mathematical proof that only intelligence could be the source, they would have said so. They say only that what they have is suggestive of that explanation.
>
> "This is reminiscent of arguments for theism based on Big Bang cosmology."

431. Winston Ewert, "The GUC Bug" Evolution News & Science, December 4, 2015.

> "In my previous post, I reviewed the arguments by William Dembski and Robert Marks in their paper 'Life's Conservation Law.' I showed that the paper is not based on any simplistic claim that all active information must derive from an intelligent source. However, it does argue that all known computer and mathematical models of Darwinian evolution are teleological."
>
> "WE have not claimed that a search algorithm like GUC can't do better than choosing a DNA sequence at random. In fact, Dembski and Marks showed that it could and provided a limit on the active information available through such a scheme. In 'Conservation of Information in Search: Measuring the Cost of Success,' they wrote:

> "Multiple queries clearly contain more information than a single query. Active information is therefore introduced from repeated queries."

"Demonstrating an algorithm using multiple random queries that outperforms a single random query is not at all surprising. It is precisely what Dembski and Marks indicated would happen."

432. Winston Ewert, "Breaking Sticks" Evolution News & Science, December 5, 2015.

433. O'Leary, "Robert Marks on the math paradox challenging physics," Uncommon Descent, December 15, 2015.

"Yesterday we noted new findings that a math paradox might make physics problems unanswerable be unanswerable (and thus maybe turn the physics problems into paradoxes too).

"Robert Marks II, computer science prof at Baylor U and editor-in-chief of Bio-Complexity, offers some thoughts:"

434. Casey Luskin, "No ID Research? Let's Help Out This Iowa State Student," Evolution News & Science, December 18, 2015.

"...let's turn to a recent op-ed in the Iowa State Daily, "Heckle: Unintelligent design part 3: Misrepresentation of evolution," by Michael Heckle, a columnist at the Iowa State University (ISU) campus newspaper who says he is studying journalism, media, and communication."

" Intelligent design advocates have done a great deal of research, leading to numerous scientific discoveries. Let's help out this student by reviewing some prominent ones, amounting to only a portion of that overall research."

"The Evolutionary Informatics Lab

"Another ID lab focuses on answering that precise question. As the website of the Evolutionary Informatics Lab puts it, "Evolutionary informatics ... points to the need for an ultimate information source qua intelligent designer."

"The lab's founders, William Dembski and Robert Marks, have some of the strongest credentials in the ID movement. With PhDs in both mathematics and philosophy, Dembski is one of the leading lights of ID. Marks is Distinguished Professor of Electrical and Computer Engineering at Baylor University and has over 250 scientific publications to his name, including many in the field of evolutionary computing."

435. "How Does Summer in Seattle Sound? Apply Now for Our Intensive 9-Day Seminars on Intelligent Design," Evolution News & Views," Evolution News & Science, December 22, 2015.

436. Seyyed Mahmoud Mirafzali Serizdi "The Darwinian Sectional in the World," Evolution Blog, December 27, 2015. [Persian], [English (Google Translation)].

437. Casey Luskin, "Peer-Reviewed Scientific Paper Develops New Ways of Measuring Complex and Specified Information in Life, Evolution News & Science, December 28, 2015.

> "Winston Ewert, Bill Dembski, and Bob Marks have recently published a new peer-reviewed paper in the journal IEEE Transactions on Systems, Man, and Cybernetic: Systems, titled 'Algorithmic Specied Complexity in the Game of Life.' The purpose of the paper is to develop the concept of algorithmic specified complexity as a new and improved method of measuring biological (and other forms of) information.
>
> "They start by observing that 'Neither fundamental Shannon nor Kolmogorov information models are equipped' to measure 'meaningful' information. As I recently explained, 'the purpose of Shannon information is to help measure fidelity of transmission of information.' "

438. Casey Luskin, "Big Announcement, and Reflections on a Great Decade," Evolution News & Science, December 31, 2015.

439. "Science, Faith & Belief in God," Bridges International, Decemeber 31, 2017. [YouTube: https://youtu.be/J1rWonYk6EE].

2016

440. Winston Ewert "Steiner Wars: An Exchange with Dave Thomas," Evolution News & Science, February 3, 2016.

> "Dave Thomas has written a post, "Target? TARGET? We STILL don't need no stinkin' Target!" He responds there to my discussion of his Steiner tree evolution simulation in my papers "Digital Irreducible Complexity" (written solely by myself) and "Climbing the Steiner Tree" (written with Dr. Robert Marks and Dr. William Dembski). He attempts to argue that his simulation falsifies irreducible complexity, and that my papers are nonsense. He is, in fact, incorrect."

441. "Algorithmic Specified Complexity Part I: Genesis," ID the Future, February 4, 2017. [Audio], [YouTube: https://youtu.be/m3_S-nglVek].

> "On this episode of ID The Future, Robert Marks and Winston Ewert, both of the Evolutionary Informatics Lab, discuss three of their recently published papers dealing with evolutionary informatics, algorithmic specified complexity and how information makes evolution work. This is the first of three segments."

442. "Listen: Information Theory for Non-Nerds Evolution News," Evolution News & Science, February 4, 2016. [Audio], [YouTube: https://youtu.be/yivqPiuqQf8].

443. ID the Future, "Listen: Robert Marks and Winston Ewert on Conway's Game of Life, ID the Future, February 10, 2016.[Audio], [YouTube: https://youtu.be/yivqPiuqQf8].

444. "Algorithmic Specified Complexity Part III: Measuring Meaning in Images," ID the Future, February 10, 2016. [Audio], [YouTube: https://youtu.be/2lhiB8jTLjc].

445. Kate Amaya "U.S. Army Announces Collaborative Alliance with Baylor's School of Engineering and Computer Science," Baylor University, May 12, 2016.

> "WACO, Texas (May 12, 2016) Today marks the official kickoff of a Collaborative Alliance (CA) between Baylor University's School of Engineering and Computer Science and the U.S. Army Research Laboratory (ARL). Through the CA, Baylor professors in the department of electrical and computer engineering will work alongside professors from Purdue University and collaborate with ARL Scientists and Engineers to develop next-generation radar hardware for future radar systems planned to begin operation around the year 2030."
>
> " 'Currently, important broadcast bands are both contested and congested,' said Robert J. Marks, Ph.D., Distinguished Professor of Electrical and Computer Engineering. 'Next-generation radar will come from a much smaller, more flexible device that is able to run operational rings around today's radar and will help make cellular devices and radar best friends forever.'
>
> "The Baylor team, led by Marks and Baylis, will work alongside Dimitrios Peroulis, Ph.D., professor of electrical and computer engineering at Purdue University, and Abbas Semnani, Ph.D., senior research scientist in the School of Electrical and Computer Engineering at Purdue University, to develop new technology that will prove useful both in war and peacetime. These efforts will coincide with parallel research performed at the Adelphi Laboratory Center (ALC) in Adelphi, Md."
>
> "The CA provides more than $850,000 in research funding that will provide research opportunities for Baylor students enrolled in the undergraduate and graduate electrical and computer engineering programs at Baylor."

446. Sarah Chaffee "Tolerate Differences in Scientific, Not Just Political, Viewpoints," Evolution News & Science, May 18, 2016.

447. O'Leary, "Will journals accept papers written by a ... computer?" Uncommon Descent, May 24, 2016.

> "They'll even try to review them. Computer science prof Robert Marks writes at The Best Schools:"

448. O'Leary, "Computer science: 'Write-only articles'," Uncommon Descent, May 31, 2016.

> "Not an improvement, apparently, on read-only memory. From Bio-Complexity's editor-in-chief Robert Marks II, some more thoughts on peer review:
>
> > "Authors are often asked to write short autobiographies in the third person at the end of their papers. In these biographies we often read self-congratulatory phrases like 'Dr. Pythagoras is the author

of over 500 journal and conference papers.' This is like saying 'Dr. Pythagoras pounded 500 nails into various types of lumber.' The pounding of the nails is unimportant. It's what you've built that counts.

"... worthless papers are called 'write-only articles,' which is funny if you know what ROM stands for. "

"

449. O'Leary, "Prof Bob Marks on what computers can't do," Uncommon Descent, December 3, 2016. [YouTube: https://youtu.be/Cm0s7ag3SEc].

"Excellent presentation by Dr. Marks."

450. David Klinghoffer "A Flash of Insight About Physics, Reality, and DNA Launched Bruce Buff as a Novelist," Evolution News & Science, December 15, 2016. [Link]

"Human creativity, Dr. [Robert] Marks notes, occurs, not algorithmically, by following a (possibly very complex) set of steps, but often in a 'flash of insight.' Mathematicians, musicians, writers, engineers, and artists all testify to this. Deep insights often occur unbidden. Roger Penrose, a former colleague of Cambridge physicist Stephen Hawking, years ago established that the human mind is not a computer and that, as a result, computers cannot be creative. Marks leaves it as an open question whether non-algorithmic computers (which we do not have and cannot yet build) could demonstrate creativity. AlphaGo, no matter how unexpected the move it made, was not creative like humans are creative. It was, like the machines before it and all who follow its lead, just doing what it was told to do."

2017

451. Nick Peters, "Book Plunge: Buried Hope Or Risen Savior?" Deeper Waters, February 2, 2017.

"What do I think of this book edited by Charles Quarles and published by B&H Academic? Let's plunge into the Deeper Waters and find out."

"By far, the most technical chapter is the next one by William Dembski and Robert J. Marks II. Those names might seem out of place in a book on the NT, but they're there because they're dealing with the probability claim as one statistician said the odds are 1 in 600 that the Talpoit Tomb is NOT the tomb of Jesus. Dembski and Marks look at this claim and apply their own mathematical approach that argues otherwise. This is the most technical chapter in the book and you would need a good knowledge of probability theory I think to understand it."

452. IMDb page for Robert J. Marks II on February 9, 2017.

453. *Introduction to Evolutionary Informatics.*

    (a) Target

    (b) World Scientific: [Covers], [Authors], [eBook], [Endorsements].

    (c) Barnes & Noble

    (d) Goodreads

    (e) Amazon

454. Kaelly Farnham, "Marketing Programs Manager at Keysight Technologies," Linkedin, May 11, 2017

    > "Engineers surround themselves with the best tools they can find. For the RF engineer, a new tool discussed in the literature recently is the Cylindrical 3D Smith Chart (also called the 'Smith Tube'). This 3D version of the classical Smith Chart allows engineers to explore data in new and interesting ways. It was pioneered by a team at Baylor University led by Dr. Baylis and presented in a landmark IEEE WAMICON paper in 2014 that introduced the 'Smith Tube' in the literature for the very first time (see more references at the end)."

455. Sarah Chaffee, "In the Dallas Morning News, Senior Scientist Weighs In on Texas Science Standards," Evolution News & Science, April 18, 2017. [Editorial]

    > "This morning, the Texas Board of Education hears public comment on the Texas Essential Knowledge and Skills (TEKS) science standards, before considering adoption later this week. As we've mentioned before, there has been a concerted push to gut the science standards of provisions asking for students to learn the scientific strengths and weaknesses of evolution.
    >
    > "Today, the Dallas Morning News features an op-ed endorsing objective standards on evolution from Dr. Robert Marks, a senior research scientist at the Evolutionary Informatics Lab and Distinguished Professor of Electrical & Computer Engineering at Baylor University"

    170423-DMN-EditorialResponse.html

456. O'Leary, "Texas: The icons of evolution are STILL on welfare after all these years?" Uncommon Descent, April 20, 2017.

    > "Baylor computer science prof Robert Marks comments on Texas science standards at Dallas Morning News:"

457. "Teach creationism or evolution in Texas science texts?: Letters to the Editor," Dallas Morning News, April 23, 2017.

    > "Professor Marks may not be able to model the creation of life on a computer, but life still exists. The professors at Baylor may not have created artificial

intelligence, but natural intelligence continues to exist. The mathematical modeling of biological evolution has progressed immensely from the time of Darwin and accurately predicts how traits will change over time."

458. The Bob Phillips Show, The Bridge, KTXW Austin, 1120 AM, April 24, 2017. [Interview promo only: https://youtu.be/3yqFX3Snzjw], [Youtube: https://youtu.be/dmNOrtWPVzs]

459. Brian Miller "Evolutionary Informatics: Marks, Dembski, and Ewert Demonstrate the Limits of Darwinism," Evolution News & Science, May 2, 2017.

> "Authors Robert Marks, William Dembski, and Winston Ewert bring decades of experience in search algorithms and information theory to analyzing the capacity of biological evolution to generate diverse forms of life. Their conclusion is that no evolutionary process is capable of yielding different outcomes (e.g., new body plans), being limited instead to a very narrow range of results (e.g., finches with different beak sizes). Rather, producing anything of significant complexity requires that knowledge of the outcomes be programmed into the search routines. Therefore, any claim for the unlimited capacity of unguided evolution to transform life is necessarily implausible."

460. Winston Ewert "Author of New Book Tells Why Evolution Simulations Don't," ID the Future, May 2, 2017. [Audio].

> "On this episode of ID the Future, Ray Bohlin interviews Winston Ewert, Ph.D., co-author with William Dembski and Robert Marks II of the new book, An Introduction to Evolutionary Informatics."

461. David Klinghoffer "Darwinian Theory Proved by Video Game? Robert J. Marks Begs to Differ," Evolution News & Science, May 3, 2017.

> "This is a sort of story that makes us roll our eyes, yet it's catnip for many reporters. Here's a recently released video game, 'Darwin's Demons' from Polymorphic Games, that seems to prove the veracity of Darwinian theory in explaining how new animals emerge from unguided evolutionary churning."
>
> "Writing at CNSNews, our friend Robert J. Marks of the Evolutionary Informatics Lab draws the distinction between evolution and adaptation. Dr. Marks, who is Distinguished Professor of Engineering at Baylor University, is co-author of a new book, Introduction to Evolutionary Informatics, that those students could profitably be assigned instead."
>
> "Dr. Marks writes (amusingly, as always):
>
>> "Adaptation differs significantly from Darwinian evolution. Humans have unquestionably adapted to discoveries in medicine, sanitation practices and improved nutrition. We are healthier and live longer than we did a few centuries ago. Marvel's X-Men celebrate new human super powers obtained through Darwinian evolution. Some who mock [intelligent design] say ID proponents should quit believing in the fairy tale of a designer. In extrapolating adaptation to

Darwinian evolution, perhaps these critics should quit believing in comic books."

"Adaptation, if anything, demonstrates intelligent design, not Darwinism. Of course they won't tell you that at the University of Idaho, or most anywhere else. Instead they'll stick you in front of a video game and tell you the stale, old fable."

462. "Why Evolution Simulations Fail: Author of Evolutionary Informatics Book Explains," Evolution News & Science, May 4, 2017.

"On a new episode of ID the Future, Ray Bohlin takes up the issue with Dr. Winston Ewert, co-author with William Dembski and Robert Marks II of a new book, An Introduction to Evolutionary Informatics."

463. Brian Miller "Book: Computer simulations yield very minor results for Darwinian evolution," Uncommon Descent, May 5, 2017.

"Authors Robert Marks, William Dembski, and Winston Ewert bring decades of experience in search algorithms and information theory to analyzing the capacity of biological evolution to generate diverse forms of life. Their conclusion is that no evolutionary process is capable of yielding different outcomes (e.g., new body plans), being limited instead to a very narrow range of results (e.g., finches with different beak sizes)."

"Evolutionary Informatics is, despite the math stuff, quite readable."

464. O'Leary "Robert Marks on new evolutionary informatics book not Darwin-friendly," Uncommon Descent, May 6, 2017.

"Don't watch this [interview of Robert Marks] if you are completely committed to your local End of Science rent-a-riot"

465. O'Leary, "Oddities from fake news: We didn't know Uncommon Descent was starving in 2015," Uncommon Descent, May 7, 2017.

"...he's been ranting about Marks, Dembski, and Ewert (Evolutionary Informatics) for years on end. As readers likely know, Marks, Dembski, and Ewert have a new book out, pictured, that'll keep English blogging."

466. Julian Charles "TMR 173: Dr. Robert J. Marks II" The Mind Renewed, May 20, 2017. [Audio Podcast], [Interview Manuscript], [Interview Manuscript (edited)], [Youtube: https://youtu.be/y3f-h08PGak], [Youtube plain: https://youtu.be/FAwEMS-GtKs].

"This week we are joined by Dr. Robert J. Marks II, Distinguished Professor of Engineering at Baylor University, for a discussion on his newly-published book, Introduction to Evolutionary Informatics, co-authored with the mathematician and philosopher Dr. William A. Dembski and the research scientist and software engineer Dr. Winston Ewert."

467. Intro to Evo Info Media Kit, June 1, 2017.

468. "About E.I." Intelligent Education, June 5, 2017.

469. "Robert J. Marks II," Intelligent Education, June 5, 2017.

470. ID the Future, "Why Digital Cambrian Explosions Fizzle ... Or Fake It," June 7, 2017. [Podcast], [Youtube: https://youtu.be/5d10MxZ5uv8].

> "This episode of ID the Future features a follow-up interview with Winston Ewert, co-author of An Introduction to Evolutionary Informatics."

471. David Klinghoffer "Falsify Intelligent Design? Try Simulating the Cambrian Explosion Digitally," Evolution News & Science, June 7, 2017.

> "Researchers have tried, in multiple cases, as Introduction to Evolutionary Informatics author Winston Ewert tells biologist Ray Bohlin on a new episode of ID the Future. But each time, the simulations hit a "complexity barrier," as the scientists themselves concede, and fail. It's a fascinating conversation."

O'Leary, "Why evolution can never get any smarter," Uncommon Descent, June 14, 2017.

> "A friend writes to raise the question of Baseners ceiling: From Robert Marks II at ENV: "We show that no meaningful information can arise from an evolutionary process unless that process is guided. Even when guided, the degree of evolutions accomplishment is limited by the expertise of the guiding information source a limit we call Baseners ceiling. An evolutionary program whose goal is to master chess will never evolve further and offer investment advice' "

472. "New Book: Introduction to Evolutionary Informatics," Thomistic Bent, June 14, 2017.

> "New book out, hot off the press: 'Introduction to Evolutionary Informatics' by William Dembski, Robert Marks, and Winston Ewart. These men are all math modelers, and they are claiming that there is no math model to explain evolution, and as such, it mathematically has not been proven. Written at the level that us non-math folks can understand.
>
> "Dr. Robert Marks says "There exists no model successfully describing undirected Darwinian evolution." Without the math to back it up, it is difficult for scientific explanations to hold for very long.
>
> "This work will likely be very influential."

473. David Klinghoffer, "Evolutionary Biologist Backs Off from Computer Simulations," Evolution News & Science, June 15, 2017.

"PZ Myers is an atheist activist and evolutionary biologist whose blog is more about promoting his left-wing politics than it is about evolution. But this caught my eye. In denouncing me for a brief post here recommending a podcast interview with Introduction to Evolutionary Informatics co-author Winston Ewert, Professor Myers tellingly backs off from the idea of computer simulations of evolution, at least where the Cambrian explosion is concerned."

"This I find *very* interesting. Dr. Myers writes:

> "I also take exception to creationist's [sic] constant focus on 'computer models'. Computer models are useful tools for assessing some ideas, but they're no substitute for real dataespecially when the events you're pursuing are not simple, and have a million different equally valid ways of producing a result. Again with the binary thinking: Cambrian evolution will not be described with a 'yes' or a 'no'."

"It's just what Robert Marks wrote here the other day. He responded to ten common objections to the evidence in Introduction to Evolutionary Informatics. This one is Myers in a nutshell:

> "2. **But Darwinian evolution is so complicated, it can't be modeled!**
> "If this objection is true, we have reached the same conclusion by different paths: There exists no model successfully describing undirected Darwinian evolution."

"Which means that on anyone's honest analysis, Darwinism fails to deliver on an expectation of what Marks calls 'hard science.' "

474. "Introduction to Evolutionary Informatics Paperback," Amazon.com, June 15, 2017.

- #32,345 in Books
- #10 in Books ¿ Computers & Technology ¿ Business Technology ¿ **Management Information Systems**
- #11 in Books ¿ Computers & Technology ¿ Computer Science ¿ **Information Theory**
- #25 in Books ¿ Computers & Technology ¿ Networking & Cloud Computing ¿ **Network**

475. Bill Bumpas, "Prof: Fears about AI overblown unless you believe 'X-Men' ", NE News Now, Thursday, June 29, 2017.

> "A Christian scholar says all the hype about artificial intelligence taking over the world is 'totally inappropriate' and that people who believe in the evolution of AI need to quit believing in comic books.

"Dr. Robert Marks II downplays those fears. Baylor University's distinguished professor of electrical and computer engineering says the capabilities of computers haven't changed since they were first invented.

"There's something called the Church-Turing Thesis, which says the computers we have today can't do anything different than the computers we had back in the 1930s," he explains. "Now they can do it a billion times, a trillion times as fast but nevertheless, they have no additional capabilities in terms of acquiring intelligence and such."

"Marks, who is considered by one group to be among the 20 most influential Christian scholars, is the premier scientist in the intelligent design (ID) movement. He finds it's interesting that people who oppose the concept of ID tell him he needs to quit believing in fairy tales, when in fact that's what they themselves are doing.

" 'I maintain these people who believe in these incredible achievements in the future of AI need to quit believing in comic books,' he counters. 'They need to quit believing in X-Men, where evolution has taken over and given all these young people these super-duper powers. It's a myth and there's certainly no evidence for it.'

"The professor explains that computers are limited in that they can only do what they're told and they have no capability of creation. He is widely quoted as saying, 'Computers are no more able to create information than iPods are capable of creating music.' "

476. Denyse O'Leary, "Information theory is bad news for Darwin: Evolutionary informatics takes off," Uncommon Descent, June 30, 2017.

"The book Introduction to Evolutionary Informatics continues to make waves. The Lab writes to say:

"A lot continues to happen surrounding the release of "Introduction to Evolutionary Informatics" by Robert J. Marks, William A. Dembski and Winston Ewert:

"Here's a quick summary of media.

" AI means the topic is Artificial Intelligence hype EV deals with Darwinian Evolution

"(AI) Janet Mefford Today A.I. Hype & Limitations with guest Robert J. Marks (American Family Radio)

"(AI) "Point of View" with Kerby Anderson. Robert J. Marks talks about AI hype

"(AI) "The Remnant Road" Raging Against the Machines with guest Robert J. Marks

"(AI) "Are Super Computers on the Verge of Becoming Our Overlords?' Terry Lowry interviews Robert J. Marks

"(AI) Bob's interview on "The Going Home Show with Mark Cope" Newstalk 102.3 KXYL

"(EV) Bob's interview with Julian Charles's on "The Mind Renewed" about "Introduction to Evolutionary Informatics"

"(EV) Bob's essay at EN "Top Ten Questions and Objections to Introduction to Evolutionary Informatics"'

"(EV) Winston Ewert's "ID the Future" podcast #1 on "Introduction to Evolutionary Informatics" titled "Author of New Book Tells Why Evolution Simulations Don't"

"(EV) Winston's "ID the Future" podcast #2 on "Introduction to Evolutionary Informatics" titled "Why Digital Cambrian Explosions Fizzle Or Fake It"

"Granville's EN "Intelligent Design Goes International A Report from Istanbul"

"(EV) Bob's essay in CNS News "Sorry Darwin: New Video Game Proves Adaptation Is Ubiquitous Not Evolution"

"(EV) Bob's editorial in the Dallas Morning News

"(EV) Bob's interview on the Bob Phillips Show in Austin."

477. Denyse O'Leary, "Who thinks Introduction to Evolutionary Informatics should be on your summer reading list?" Uncommon Descent, July, 1 2017.

"Robert Marks sends these endorsements for Evolutionary Informatics:

"(Note: It is surprisingly easy to read.)

"An honest attempt to discuss what few people seem to realize is an important problem. Thought provoking!"
Gregory Chaitin, Ph.D.
Professor, Federal University of Rio de Janeiro
Eponyms: Kolmogorov-Chaitin-Solomonov Information Theory
Chaitin's Number
Chaitin's algorithm
Author of:The Unknowable
Meta Math!: The Quest for Omega
The Limits of Mathematics
Thinking about Gdel and Turing: Essays on Complexity
Algorithmic Information Theory.

"Darwinian pretensions notwithstanding, Marks, Dembski, and Ewert demonstrate rigorously and humorously that no unintelligent process can account for the wonders of life."
Michael J. Behe, Ph.D.
Professor of Biological Sciences , Lehigh University
Author of: Darwin's Black Box
The Edge of Evolution
"This is a fine summary of an extremely interesting body of work. It is clear, well-organized, and mathematically sophisticated with-

out being tedious (so many books of this sort have it the other way around). It should be read with profit by biologists, computer scientists, and philosophers."
David Berlinski, Ph.D.
Author of: The Devil's Delusion, The Deniable Darwin and Other Essays, The King of Infinite Space: Euclid and His Elements
"For decades and decades, the ubiquitous cultural lie is that Intelligent Design advocates do nothing but rehash old criticisms of evolutionary theory. They never present fresh, positive research that supports ID theory. Now repeating serious criticisms of evolution is very important, especially since the universities, state school boards, and the ACLU have guaranteed that students must never hear of the problems with evolutionary theory. Still, the ID movement must present positive research for its views, and since this has been done for years through a number of publications, it is now a sign of ignorance, intellectual bigotry and bad faith for people to perpetuate this cultural lie. It is itself a lie. But with the publication of the ground-breaking book, Introduction to Evolutionary Informatics, there is now a cutting-edge positive ID research volume that does fresh, heretofore unpublished (and un-thought of!!) ideas that get to the very deepest bottom of recent science that is not only relevant to the ID/Evolution debate, but actually devastates evolutionary theory at the ground floor. In my view, no one reading this book can continue to adopt Theistic Evolution on philosophical and scientific grounds alone. This is must reading for all believers and unbelievers interested in the debate, and Christians who are scientists have, I believe, a moral and spiritual duty to read this book. Though somewhat difficult, Marks, Dembski and Ewert have done a masterful job of making the book accessible to the engaged and thoughtful layperson. I could not endorse this book more highly."
J.P. Moreland, Ph.D.
Distinguished Professor of Philosophy, Biola University,
Author of: The Soul: How We Know It's Real and Why It Matters
"With penetrating brilliance, and with a masterful exercise of pedagogy and wit, the authors take on Chaitin's challenge, that Darwin's theory should be subjectable to a mathematical assessment and either pass or fail. Surveying over seven decades of development in algorithmics and information theory, they make a compelling case that it fails."
Bijan Nemati, Ph.D.
Jet Propulsion Laboratory
California Institute of Technology

"Dr. Marks has been at the forefront of research on evolutionary algorithms for three decades. However, in 2007 his university re-

moved the website of his Evolutionary Informatics group because his research was a threat to the status quo in evolutionary biology. Nonetheless, Dr. Marks and his colleagues continued to pursue research into the informational requirements of evolutionary algorithms, the result of which is found in this volume. If you want to know what information theory says about evolution, this is the volume to read."
Jonathan Bartlett, Director
The Blyth Institute
Author Programing from the Ground Up
Building Scalable Web Applications Using the Cloud
Coeditor Engineering and the Ultimate: An Interdisciplinary Investigation of Order and Design in Nature and Craft
Naturalism and Its Alternatives in Scientific Methodologies

"Introduction to Evolutionary Informatics is a lucid, entertaining, even witty discussion of important themes in evolutionary computation, relating them to information theory. It's far more than that, however. It is an assessment of how things might have come to be the way they are, applying an appropriate scientific skepticism to the hypothesis that random processes can explain many observed phenomena. Thus the book is appropriate for the expert and non-expert alike."
Donald Wunsch, Ph.D.
Mary K. Finley Missouri Distinguished Professor
Director of the Applied Computational Intelligence Lab
Missouri University of Science & Technology
IEEE Fellow, INNS Fellow
Past President of the International Neural Networks Society
Coauthor of Neural Networks and Micromechanics
Unified Computational Intelligence for Complex Systems Clustering
"Evolution requires the origin of new information. In this book, information experts Bob Marks, Bill Dembski, and Winston Ewert provide a comprehensive introduction to the models underlying evolution and the science of design. The authors demonstrate clearly that all evolutionary models rely implicitly on information that comes from intelligent design, and that unguided evolution cannot deliver what its promoters advertise. Though mathematically rigorous, the book is written primarily for non-mathematicians. I recommend it highly."
Jonathan Wells, Ph.D. Ph.D.
Senior Fellow, Discovery Institute
Author of: Zombie Science,
Icons of Evolution
The Myth of Junk DNA

"When biologists finally come to terms with the fact that Darwinism was a long experiment in collective self-deception, the work described in this book will deserve much of the credit for putting things right."
Douglas Axe, Ph.D.
Director of Biologic Institute
Author of Undeniable: How Biology Confirms Our Intuition That Life Is. Coauthor of Science and Human Origins

"Introduction to Evolutionary Informatics helps the non-expert reader grapple with a fundamental problem in science today: We cannot model information in the same way as we model matter and energy because there is no relationship between the metrics. As a result, much effort goes into attempting to explain information (and intelligence) away. The authors show, using clear and simple illustrations, why that approach not only does not work but cannot work. It impedes understanding of our universe. The picture that emerges from their work is of a universe that is at the same time more mysterious than we had been led to expect and more familiar."
Denyse O'Leary, Science Writer.
Author/Coauthor of:
The Spiritual Brain: A Neuroscientist's Case for the Existence of the Soul
By Design Or By Chance?: The Growing Controversy On The Origins Of Life In The Universe

"Marks, Dembski, and Ewert have written a book summarizing in a very accesible way all of their research at the Evolutionary Informatics Lab for the last decade. If the blind watchmaker says "me thinks it is like a weasel", they say "perhaps, but in order to see it you need these active-information glasses." When the watchmaker is able to see with the glasses (and he needs them to be certain it is a weasel), he is not blind anymore. He is, like the programmer of an evolutionary algorithm, an intelligent designer with a very clear sight of his target. Oh, yes, it was a weasel!' "
Daniel Andrs Daz Pachn, Ph.D.
Research Assistant Professor, Biostatistics, University of Miami
"This is an important and much needed step forward in making powerful concepts available at an accessible level."
Ide Trotter, Ph.D.
Trotter Capital Management Inc.
Founder: Trotter Prize & Endowed Lecture Series on Information, Complexity and Inference (Texas A&M)
"Steampunk fiction anachronistically fuses Victorian steam powered

technology into the digital age. Darwinism is steampunk science.' It is an analog-based Victorian relic trying to make its way in the digital information age. Darwin had no conception of the information problem facing any account of naturalistic evolution. Darwin's 21st century successors certainly know about the problem, but as Marks, Dembski and Ewert demonstrate in Introduction to Evolutionary Informatics, in 2017 they are no closer to solving the problem than Darwin was in 1859. This lay-accessible introduction to the information issue and how it remains unsolved is absolutely essential to anyone who wants to understand how all life is fundamentally information-based, and how naturalistic evolutionary science has not come remotely close to solving the problem of how meaningful information can arise in the absence of intelligence."
Barry Arrington, D.Jur.
Colorado House of Representatives (1997-1998)
Editor-in-Chief, UncommonDescent.com
"One of the things Intelligent Design theorists do is take what is obvious to the layman, that unintelligent forces cannot do intelligent things, and state it in more rigorous, scientific terms, so that highly educated people can understand also. This book makes important contributions to that effort, using results and terminology from information theory."
Granville Sewell, Ph.D.
Professor of Mathematics, University of Texas, El Paso
Author of: Computational Methods of Linear Algebra
In the Beginning: And Other Essays on Intelligent Design
Christianity for Doubters
"A very helpful book on this important issue of information, which evolution cannot explain. Information is the jewel of all science and engineering which is assumed but barely recognised in working systems. In this book Marks, Dembski and Ewert show the major principles in understanding what information is and show that it is always associated with design."
Andy C. McIntosh DSc, FIMA, C.Math, FEI, C.Eng, FInstP, MIGEM, FRAeS.
Visiting Professor of Thermodynamics, School of Chemical and Process Engineering, University of Leeds, LEEDS, UK. Adjunct Professor, Department of Agricultural and Biological Engineering. Mississippi State University, Starkville, Mississippi, USA

People who don't like the book still won't."

478. "Dr. Brian Miller Explores Coevolution," ID the Future, October 24, 2017.

"On this episode of ID The Future, Sarah Chaffee interviews Center for Science and Culture Research Coordinator Dr. Brian Miller about co-evolution.

Together they explore a recent paper on the subject by Winston Ewert and Robert Marks in BIO-Complexity."

479. David Klinghoffer, "For Beleaguered Computer Simulations of Evolution, Can Co-Evolution Save the Day?" Evolution News & Science, October 30, 2017. [LINK]

"With enviable lucidity, Dr. Miller talks with Sarah Chaffee about research by Winston Ewert and Robert Marks in the journal BIO-Complexity that takes on the co-evolution epicycle.

The hope, Miller explains, was that "co-evolutionary algorithms can bypass the New Free Lunch theorems because they can somehow provide active information to find distant targets, or perhaps they can bypass the need for this active information." But Ewert and Marks have splashed cold water on that one. It turns out that co-evolutionary algorithms are no solution, since they perform no better, and sometimes worse, than the old algorithms. In other words, for Darwin defenders, its back to the drawing board."

480. Johmmy B. "Evolutionary Biology's Wrong Turn," Uncommon Descent, November 29, 2017.

"As it says in one of the taglines for Robert Marks Evolutionary Informatics lab (an Intelligent Design venture), they are "Investigating How Information Makes Evolution Possible". In other words, evolutionary teleonomy."

481. David Klinghoffer, "Intelligent Design and Artificial Intelligence The Connection," Evolution News & Science, December 20, 2017. [Podcast], [YouTube: https://youtu.be/ZStcSl1RMps], [Video Download].

"It seems obvious on a moment's reflection: intelligent design and artificial intelligence have something in common, and that is intelligence. What's the significance of that? In an illuminating conversation for ID the Future, Robert Crowther talks about the connection with Dr. Robert Marks of Baylor University, co-author of the recent book Introduction to Evolutionary Informatics.

"Marks and his fellow researchers have shown that evolution isn't computable, meaning it can't be successfully modeled "There exists no model successfully describing undirected Darwinian evolution," as Marks puts it. And you know what? The qualities that make human intelligence special are similarly not computable.

"That, as Professor Marks explains among other helpful observations, makes fantasies about AI robots taking over the world, developing consciousness, or displacing the human race incompatible with reality."

2018

482. David Klinghoffer, "Elon Musk Intelligent Design Proponent?" Evolution News & Science, January 8, 2018. [Podcast], [YouTube: https://youtu.be/w1Do06Uf6Ks].

"Robert Crowther sits down with Robert Marks for a typically engaging and enlightening conversation. Dr. Marks is Distinguished Professor of Electrical and Computer Engineering at Baylor University. His most recent book is Introduction to Evolutionary Informatics, co-authored with William Dembski and Winston Ewert. Marks makes, among other provocative points, the observation that Elon Musk of Tesla, SpaceX, and PayPal fame must be considered a proponent of intelligent design.

"Admittedly, that may come as a surprise to Elon Musk, and not necessarily a pleasant one. But I think Marks defends the argument with a certain persuasive mischievousness. Also on the podcast, Dr. Marks explains why computers will never achieve consciousness or human understanding."

483. "Evolutionary informatics has come a long way since a Baylor dean tried to shut down the lab." Uncommon Descent, January 11, 2018.

"Robert Marks II writes to offer updates on the Introduction to Evolutionary Informatics book."

484. David Klinghoffer "Robert Marks on the Lovelace Test." Evolution News & Science, January 23, 2018. [Link].

"A postscript here to a couple of posts by Sarah Chaffee. She notes today the views of Robert Marks, author of Introduction to Evolutionary Informatics, on the limits of what can be expected, for good or bad, from AI robots. In an earlier post, she considered the genius of a computer program, AIVA, that composes classical music."

"AIVA can combine musicals styles - that of, say, Bach and Beethoven, if you feed it enough of those two composers works. What such a program cant do is innovate, says Dr. Marks. It cant strike out in a new direction of its own, put Bach together with Beethoven and come up withStravinsky. Such a leap would be uncomputable, therefore permanently beyond the reach of even the most cleverly designed artificial intelligence.

"Marks explains the Lovelace test which, unlike the better-known Turing test, focuses precisely on this hard limit to what computer algorithms can do. AI cannot, in this sense, truly create. That indicates an impassable border for AI, not the only one. Beyond lies the unique realm of the human, no matter what addled things Stephen Hawking may say about computers 'replacing' us. "

485. Sarah Chaffee "Terrified of a Robopocalypse? Dont Be," Evolution News & Science, January 23, 2018. [Link]

"These statements sound remarkably like what Robert Marks, Distinguished Professor of Electrical and Computer Engineering at Baylor University, noted in a recent ID the Future podcast:

> "Anything you can think of writing an algorithm to do will eventually be replaced. But then there are other things such as webmasters, computer programmers, and such, that wont be replaced. Ive heard these people referred to as knowledge-workers. So, yeah I see this quite a bit. The other thing which is also intriguing is the ability of artificial intelligence to augment our performance. I think that all technology augments a human trait cars go faster than we do, calculators add faster than we do. So, were going to be augmented by access to the knowledge of the world. I have that at my fingertips now on my cell phone it blows my mind! Im old enough to remember going to the library looking for a paper, and going through the stacks and finally finding the volume and opening it to the page and some jerk has ripped it out and taken it away. And I dont have to worry about that anymore. I can just look it up on my phone; its incredible. Now, theres a trade-off because Ive sacrificed totally my privacy. Google knows where I am every second of the day, I imagine. So there are going to be trade-offs of that sort too."

"Robert Marks is the co-author of the new book Introduction to Evolutionary Informatics."

486. O'Leary "Robert Marks on the Turing Test vs the Lovelace Test for computer intelligence," Uncommon Descent, January 25, 2018. [Link].

487. James C. Bezdek, "Celebrating 25 Years of the IEEE TRANSACTIONS ON FUZZY SYSTEMS by James Bezdek," IEEE Transactions on Fuzzy Systems, vol. 26, #1 2018

> "Bob Marks invited me to join the IEEE Neural Networks Council (NNC) in the summer of 1991."

488. Live webinar with Robert Marks, Baylor U, on artificial intelligence and human exceptionalism.

489. Sarah Chaffee, "Education or Obfuscation? Avida in Science Class," Evolution News & Science, February 16, 2018. [Link].

> "In their recent book Introduction to Evolutionary Informatics, Robert Marks, William Dembski, and Winston Ewert, of the Evolutionary Informatics Lab, offer a more sober perspective."

490. Jayantika Soviana, "Robert J. Marks II," Integrasi Science, March 7, 2018 [Link.]

> "Robert J. Marks II adalah Profesor Teknik Elektro dan Komputer terkemuka di Universitas Baylor di Waco, Texas. Sebelumnya, ia pernah berada di fakultas Universitas Washington selama 25 tahun. Dia adalah pelopor dalam bidang kecerdasan komputasi (termasuk jaringan saraf, himpunan fuzzy, dan komputasi evolusioner), dan merupakan presiden pertama dari

Institute of Electrical and Electronics Engineers (IEEE) Neural Networks Council. [Indonesian]"

491. Barry Arrington "We Cannot, in Principle, 'Know' Whether a Machine is Conscious," Uncommon Descent, April 9, 2018. Barry Arrington "We Cannot, in Principle, 'Know' Whether a Machine is Conscious," Uncommon Descent, April 9, 2018. [Link.]

492. Andrew Jones, "Digital Evolution and Bohemian Bugs," April 26, 2018. [Link.]

493. David Klinghoffer "New Discovery Institute Center to Explore Threat, Promise, Limits of AI; Seattle Launch on July 11," Evolution News & Science, June 5, 2018. [Link.]

> "Dr. Bradley will be joined by the Centers new director, Robert J. Marks, Distinguished Professor of Electrical and Computer Engineering at Baylor University; mathematician, author, and entrepreneur William Dembski; neuroscientist Michael Egnor of Stony Brook University; and Microsoft data scientist George Montañez.
>
> "Dr. Marks and his colleagues will outline the goals of the Center, introduce staff and fellows, and engage the audience in a provocative discussion. "

494. "Will the Machines Take Over? Human Uniqueness in the Age of Smart Machines." [registration]. [Link.]

> "In addition to guest-of-honor Walter Bradley, the July 11 event will feature:
>
> (a) mathematician, author, and entrepreneur William Dembski.
> (b) Director of the new Bradley Center Robert J. Marks, Distinguished Professor of Electrical and Computer Engineering at Baylor University.
> (c) Stony Brook University neurosurgeon Michael Egnor.
> (d) Microsoft data scientist George Montañez.
>
> This is a FREE event, but space is limited, so registration is required!"

495. David Klinghoffer "Bradley Center to Sort Reality from Rubbish on AI," Evolution News & Science, June 20, 2018. [Link.]

> "The Bradley Center officially launches on Wednesday, July 11 in Seattle, and we hope you will join us to celebrate, meet the new Fellows of the Center, and participate in a fascinating panel discussion. More information is here. The panelists, including Dr. Marks, are scientists with an appropriately strong humanistic and philosophical bent: mathematician William Dembski; neuroscientist Michael Egnor of Stony Brook University; and Microsoft data scientist George Montaez. Discovery Institute Fellow Walter Bradley, who co-authored the pioneering book The Mystery of Lifes Origin: Reassessing Current Theories, and for whom the Center is named, will be the guest of honor."

496. Stacy Tillie, "Researching for the Sky," Baylor Magazine, Summer 2018 [Link.]

497. "Walter Bradley Center for Natural and Artificial Intelligence launches Wednesday, July 11," Uncommon Descent, July 10, 2018. [Link.]

498. "Will the Machines Take Over? Human Uniqueness in the Age of Smart Machines An event celebrating the launch of the Walter Bradley Center for Natural and Artificial Intelligence at Discovery Institute," Evolution News & Science, July 11, 2018. [Link.]

> "In addition to guest-of-honor Walter Bradley, the July 11 event will feature:
>
> - mathematician, author, and entrepreneur William Dembski.
> - Director of the new Bradley Center Robert J. Marks, Distinguished Professor of Electrical and Computer Engineering at Baylor University.
> - Stony Brook University neurosurgeon Michael Egnor.
> - Microsoft data scientist George Montañez.
>
> This special event will take place from 7:30-9:30 pm in the William Allen Theater at the Museum of Flight in Seattle."

499. Finding Hidden Connections, "New Bradley Center Launches; Will Consider Promise and Threat of Artificial Intelligence," July 16, 2018. [Link.]

500. David Klinghoffer, "New Bradley Center Launches; Will Consider Promise and Threat of Artificial Intelligence," Evolution News & Science, July 17, 2018. [Link.]

501. William A. Dembski, "HOW HUMANS CAN THRIVE IN A WORLD OF INCREASING AUTOMATION," MindMatters.today JULY 17, 2018 [Link.]

> "First, however, I want to thank friends and colleagues of Seattles Discovery Institute for their vision in forming this center and providing it with a secure home. Thanks go especially to Bruce Chapman and Steven Buri for making the center a full-fledged program of Discovery; to John West for working through the many crucial details; to Robert J. Marks, a towering presence in the field of computational intelligence, for his willingness to lead the center; and finally to Walter Bradley for giving us not only his name but also his example and inspiration, about which I will have more to say in a moment."

502. "William Dembski: Descartes Understood the Limits of Artificial Intelligence," Wired Tech Focus, July 18, 2018 [Link.]

> "...the Centers director, Robert Marks, read Dembskis address to us, and it is remarkable, both profound and humane."

503. William Dembski, "VIRTUAL RAILROADS AND WEST VIRGINIA BACK ROADS: AIs Temptation to Theft Over Honest Toil," Mind Matters.today, July 26, 2018. [Link.]

> "My colleague Robert Marks dubs such a reconfiguration of the environment a virtual railroad. His metaphor is spot on. Without such a virtual railroad, fully automated vehicles simply face too many unpredictable dangers and are apt to go off the rails. Marks, who hails from West Virginia, especially

> appreciates the dangers. Indeed, the West Virginia back roads are particularly treacherous and give no indication of ever submitting to automated driving."

504. Denyse O'Leary, "AI That Can Read Minds? Deconstructing AI Hype," Uncommon Descent, August 5, 2018. [Link.]

> "From computer engineering prof Robert J. Marks at Mind Matters Today: Fake and misleading AI news is everywhere today."

505. Eric Holloway "COULD ONE SINGLE MACHINE INVENT EVERYTHING?" Mind Matters, August 15, 2018. [Link.]

> "The basic idea is that conventional evolutionary programs have an upper bound on performance even when the fitness changes in time. This ceiling was explored in Introduction to Evolutionary Informatics. Claims about open-ended evolution try to skirt this limitation. My paper outlines the problem, which applies to artificial intelligence as well as to unintelligent evolution."

506. ERIC HOLLOWAY, "SLAUGHTERBOTS: HOW FAR IS TOO FAR? And how will we know if we have crossed a line?" Mind Matters, September 4, 2018. [Link.]

> "Editors note: On Monday, Robert J. Marks addressed the question raised by the film Slaughterbots: Is it ethical to develop a swarm of killer AI drones? Tonight, Eric Holloway adds some thoughts:... The moral argument Dr. Marks raises is a difficult one. Where do we draw the line? If all scientific research and weapon development are justifiable to win a total war, then even something as horrible as Nazi and Communist human experimentation is licit if it means we develop the superhuman shock troopers ahead of the enemy."

Podcast: Winston Ewert on the Dependency Graph vs. Darwins Tree of Life, Part 1 [Link.]

507. Wiki Visual: Robert J. Marks II, October 11, 2018. [Link.]

508. David Klinghoffer, "From Ewerts Dependency Graph Paper A 'Gut Punch' to Darwin's Tree¿' Evolution News & Science, October 11, 2018 [Link.]

> "Im reminded again that Marks, among many other distinctions, was born to podcast. He's really very good at it. His interview with Ewert is a winner, quite amusing and accessible, especially for such a potentially recondite subject."

509. David Klinghoffer, "Critics Need to Grapple with Ewert's Challenge to Darwin's Tree" Evolution News & Science, October 17, 2018 [Link.]

Eric Holloway, "An Artificial Controversy," EIDOS, October 16, 2018. [Link.]

510. Eric M. Eckert, "Annual Baylor Business Ethics Forum to Address 'Ethics of Artificial Intelligence'," Oct. 22, 2018. [Link.]

511. Business Ethics & Leadership Ethics Forum Speakers, October 25, 2018. [Web, Bio, Link, Flyer.]

512. "What can math and computer simulations tell us about the limits of evolution?," REASONABLE FAITH University of Texas, Nov. 1, 2018. [Schedule, Poster.]

513. Brian Miller, "Examining Randy Isaac's Critique of Introduction to Evolutionary Informatics," Evolution News & Science, October 31, 2018. [Link.]

> "In an article yesterday I examined physicist Randy Isaac's criticisms of several science chapters in Theistic Evolution: A Scientific, Philosophical, and Theological Critique. Today, I will discuss his critique of the content of the TE book that draws from Introduction to Evolutionary Informatics by Robert Marks, Bill Dembski, and Winston Ewert (MDE). The authors' work is particularly significant since it demonstrates that no evolutionary process could achieve novel outcomes which correspond to generating significant amounts of new information."

514. "WILL 'SMART MACHINES' TAKE OVER OUR JOBS?" SUNDAY, NOVEMBER 4 , 2018, DALLAS COUNTRY CLUB. (flyer).

515. Baylor Faith & Reason Panel: sponsors: ASA (American Scientific Association), Oso Logos, SPS (Society of Physics Students), Nov 13, 2018.

> "Baylor faculty Panelists: Dr. Lorin Matthews (General Studies), Dr. Tom Ward (Philosophy), Dr. Walter Wilcox (Physics), Dr. Robert J. Marks (Engineering)."

516. "Human consciousness may not be computable," Uncommon Descent, November 27, 2018. [Link.]

517. "Robert Marks Talks Computers with Michael Medved," Uncommon Descent, November 29, 2018 [Link.]

518. David Klinghoffer, "Great Minds: Robert Marks, Michael Medved on the Limits of Computation," Evolution News & Science, November 29, 2018. [Link.]

> "On a new episode of Great Minds with Michael Medved, Dr. Robert Marks of Discovery Institutes Bradley Center for Natural and Artificial Intelligence casts some very helpful light on the limits of AI."

519. DENYSE O'LEARY, "ROBERT J. MARKS TALKS COMPUTERS WITH MICHAEL MEDVED," Mind Matters, November 29, 2018. [Link.]

> "Recently, Robert J. Marks, director of the Walter Bradley Center for Natural and Artificial Intelligence, sat down with radio host and author Michael Medved to help sort through the confusion about what artificial intelligence can and cant do, now and in the future."

520. "Whether or not man has free will, quantum mechanics means that nature does," Uncommon Descent, December 6, 2018. [Link.]

521. Denyse O'Leary, "AI Apprehension: Is Artificial Intelligence Taking Over? Or Is a Fashionable Panic Afoot?" Salvo Magazine, December 7, 2018. [Link.]

> "Baylor computer engineering professor Robert J. Marks notes that Gdel's Theorem, a key moment in mathematics, shows that some things are outside the laws of mathematics. In any event, they are not computable. And there is no evidence that algorithms, by themselves, become creative and produce large amounts of new information. The source of large amounts of new information is still elusive."

522. David Klinghoffer, "Robert Marks: Randomness and the Enigma of Creativity," Evolution News & Science, December 7, 2018 [Link.]

> "Is there any true randomness in nature? Or are deterministic processes the rule, even down at that quantum level? Over at Mind Matters, Robert Marks examines these questions in a really interesting post. From 'Quantum Randomness Gives Nature Free Will':"

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11.4 IEEE CoNNections (NNC Newsletter)

1. 1991: #1, #2.
2. 1992: #1, #2, #3, #4.
3. 1993: #1, #2, #3, #4.
4. 1994: #1,

11.5 Acknowledgements. Announcements & Listings

1989

1. Kwang Cheung, "Image Sampling Density Reduction Below That of Nyquist" (Ph.D. Dissertation Abstract). IEEE ASSP Magazine, Volume 5, Number 4, October 1989, pp.28-29

1990

2. Ken Sadahiro, "Professors Participate in Northconl90," EE News (University of Washington), Vol. 5, #1 (October 1990) p5.
3. "Shannon Sampling and Interpolation Theory ," Association for Media-based Continuing Education for Engineers (AMCEE), Video Short Course, 1990-91
4. "Introduction of Artificial Neural Systems," University of Washington
5. "Introduction of Artificial Neural Systems," Association for Media-based Continuing Education for Engineers (AMCEE), Video Short Course, 1990-91
6. "Fluke..." Puget Sound Business Journal, February 5, 1990
7. 1990 IJCNN

1991

8. "Introduction to Shannon Sampling and Interpolation Theory" Spinger Electrical Engineering Newsletter #1 (1991)
9. IEEE Seattle Section Annual Meeting, February 20, 1991 (announcement)
10. "Introduction to Shannon Sampling and Interpolation Theory" (flyer)
11. IEEE Distinguished Lecturer Handbook, 1991, pp. 50-53
12. IEEE Distinguished Lecturers Program, CoNNections: The Newsletter of the IEEE Neural Networks Council, October 1991 p.6
13. 1991 TAB Annual Report
14. Neural Networks President's Forum, Tuesday, July 9, 1991, 6:30 p.m. - 8:00 p.m., Room 612, Washington State Convention Center
15. International Joint Conference on Neural Networks, Singapore, November 18-21,1991 , CFP (USA Liaison) 1991 IJCNN Seattle

1992

16. Y.X. Zhong, " Greetings from the Program Committee," Proceedings of the 1992 International Joint Conference on Neural Networks (IJCNN), Beijing, China, November 3-6, 1992, p.2.
17. 1992 International Joint Conference on Neural Networks (IJCNN), Beijing, China, November 3-6, 1992 (International Advisory Co-Chair).

18. 1992 International Joint Conference on Neural Networks (IJCNN), Beijing, China, (CFP) CoNNections: The Newsletter of the IEEE Neural Networks Council, September 1992, vol. 2, No. 3, p.13.

19. Proceedings of the IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis, October 4 - 6, 1992, Victoria, BC, Canada. (Organization Chair)

20. James C. Bezdek & Sankar K. Pal, Preface to Fuzzy Models for Pattern Recognition Methods That Search for Structures in Data, IEEE Press 1992, p.xi.

21. Proceedings of the RNNS/IEEE Symposium on Neuroinformatics and Neurocomputing, Rostov-on-Don, Russia, October 7- 10, 1992 (International Chair)

22. The RNNS/IEEE Symposium on Neuroinformatics and Neurocomputing, Rostov-on-Don, Russia (CFP), CoNNections: The Newsletter of the IEEE Neural Networks Council, September 1992, vol. 2, No. 3, p.14.

23. J.C. Bezdek, "Conference Report: FUZZ-IEEE '92," CoNNections: The Newsletter of the IEEE Neural Networks Council, May 1992, vol. 2, No. 2, p.5.

24. J.C. Bezdek, "A Message From the General Chair," IEEE International Conference on Fuzzy Systems, San Diego, March 8-12,1992.

25. Teck Seng Low, "IJCNN 91 Singapore: The International Joint Conference on Neural Networks", CoNNections: The Newsletter of the IEEE Neural Networks Council, Vol.2, No.1, February 1992, pp.5-6

    "Photos courtesy Bob Marks"

26. RNNS/IEEE Symposium on Neuroinformatics and Neurocomputing (CFP) CoNNections: The Newsletter of the IEEE Neural Networks Council, October 1991 p.6 (International Chair)

27. Clifford Lau, "IJCNN 92, The best conference on neural networks ever," CoNNections: The Newsletter of the IEEE Neural Networks Council, September 1992, vol. 2, No. 3, p.9.

1993

28. "Computational Intelligence: Imitating Life", CoNNections: The Newsletter of the IEEE Neural Networks Council, Vol.3, No 4, December 1993.

29. Thomas P. Caudell, "VRAIS 1993", CoNNections: The Newsletter of the IEEE Neural Networks Council, Vol.3, No 4, December 1993, p.1, 5-6.

30. Takanori Shibata, "IJCNN-1993 Nagoya", CoNNections: The Newsletter of the IEEE Neural Networks Council, Vol.3, No 4, December 1993, p.5.

31. Russell C. Eberhart, "President's Message", CoNNections: The Newsletter of the IEEE Neural Networks Council, Vol.3, No 4, December 1993, p.3.

32. Colin Weil, "Our First Year Looking Forward (and Backward)" Fuzzy Logic and Neural Network Interest Group (FLANNIG), Vol. 1, No. 3 , December 1993 , p.1

33. The First New Zealand International Two-Stream Conference on Artificial Neural Networks and Expert Systems, November 24-26, 1993, Dunedin, New Zealand (Program Committee)

34. IEEE/Tsukuba International Workshop on Advanced Robotics, November 8-9, 1993, AIST Tsukuba, Japan - Advisory Committee.

35. Thomas A. Furness, "Greetings From the General Chair"

36. IEEE Virtual Reality Annual International Symposium, Sept 18-22, 1993, Seattle, WA, pp.i-ii

37. Enrico H. Ruspini, "1993 IEEE International Conference on Nearal Netorks (ICNN'93), Second IEEE International Conference on Fuzzy Systems (FUZZ-IEEE'93)" CoNNections: The Newsletter of the IEEE Neural Networks Council, Vol.3, No2, July 1993, pp.3-4 - Acknowledgement

38. WCCI 1994 CFP, CoNNections: The Newsletter of the IEEE Neural Networks Council, Vol.3, No 2, July 1993.

39. Artificial Neural Networks in Electric Power Systems, September 9 - 11, 1992, Madrid, Spain (September 7-11, 1992)

1994

40. Patrick K. Simpson "Presidents Message," Proceedings of the IEEE World Congress on Computational Intelligence, p.2 (1994) - Acknowledgement

41. Piero Bonissone "Greetings from the FUZZ-IEEE Conference Chair," Proceedings of the IEEE World Congress on Computational Intelligence, p.3 (1994)

42. "EE400: Introduction to Fuzzy Systems," Fuzzy Logic and Neural Network Interest Group (FLANNIG), Vol 2, No. 2, March 1994, p.2

43. Fuzzy Logic

44. Technology and Applications ad in The Institute, vol.18, No. 2, March/April 1994. FUZZ-IEEE/IFES, Yokohama, 1995 flyer

45. International Conference on Neural Information Processing (ICONIP) 1994, Seoul, Korea (International Advisory Committee

46. "EE400: Introduction to Fuzzy Systems," Fuzzy Logic and Neural Network Interest Group (FLANNIG), Vol 2, No. 2, March 1994, p.2
47. R.J. Marks II, Fuzzy Logic Technology & Applications, IEEE Press, 1994 (FLYER)

1995

48. JFTA (Joint Time-Frequency Analysis) - A New Perspective on Signal Analysis National Instruments adopts the cone shaped kernel introduced by Zhao, Atlas & Marks
49. Bing Sheu, Mohammed Ismail, Edgar Sanchez-Sinencio and Tony H. Wu, Microsystems Technology for Multimedia Applications: An Introduction (IEEE Press, 1995)

1999

50. "It's Toon Time", The IEEE Institute, vol. 23, No 1, January 1999, p.14
51. TV Times, March 7-13, 1999 (Seattle Times). Graduate courses taught by Robert Marks, such as Multidimensional Signal Processing, were broadcast on cable TV.

2006

52. 060101 The joy of mathematics (Stolen draft of Marks's Handbook of Fourier Analysis)

2007

53. 071201 (The Rope) PRESIDENT LILLEY SIGNS OFF ON CAMPUS HAZING RESEARCH GRANT (parody)

2012

54. Head of Baylor ECE Faculty Search committee

11.6 Journals in the News

1. Australian Journal Of Intelligent Information Processing Systems [Editorial Board]
2. IEEE Transactions on Fuzzy Systems [Associate Editor]
3. IEEE Transactions on Neural Networks [Editor-in-Chief]
4. IEEE Transactions on Neural Networks [Co Guest Editor]
5. Journal of Advanced Computational Intelligence [Editor]
6. Journal of the Optical Society of America A [Topical Editor]

7. Neurocomputing [Editorial Board]. V. David Sanchez A., "Presenting the Editorial Board,"
8. Neurocomputing, An International Journal, vol.2 (1990) pp. 1-3.
9. Neural Network Implementation, IEEE Circuits & Devices Magazine, 1989 [Analog — Optical — Digital]
10. "Everyday Applications of Neural Networks," Special Issue (1996).

12 Statistics

For the bean counters.

12.1 Publication Count

- ◇ 10 books. (List in Section 6.1 on page 18.)
- ◇ 171 journal publications. (List in Section 6.3 on page 24.)
- ◇ 237 conference & edited papers. (List in Section 6.4 on page 40.)
- ◇ 38 book chapters. (List in Section 6.2 on page 19.)
- ◇ 3 patents. (List in Section 6.5 on page 65.)
- ◇ 72 abstracts. (List in Section 6.6 on page 66.)
- ◇ 80 Selected Talks / Presentations/ Interviews. (List in Section 10 on page 99.)
- ◇ 30 interviews. (List in Section 30 on page 103.)
- ◇ 24 hosted interviews. (List in Section 24 on page 106.)
- ◇ 66 supervised theses and dissertations. (List in Section 13.1.1 on page 261.)
- ◇ 60 cross disciplinary theses and dissertations. (List in Section 13.1.2 on page 263.)
- ◇ 66 grants. (List in Section 7 on page 83.)
- ◇ 246 coauthors. (List in Section 13.2 on page 265.)
- ◇ 26 different coauthor countries. (List in Section 13.2.1 on page 268.)
- ◇ 57 distinct journals. (List in Section 13.3 on page 268.)
- ◇ 143 different city venues. (List in Section 13.4 on page 269.)

12.2 Courses Count

Number of different courses taught.

- ◇ 6 at Baylor University. (List in Section 8.1 on page 87.)
- ◇ 25 at the University of Washington. (List in Section 8.2 on page 88.)

12.3 In The News Count

- ◇ 18 Award Articles (List in Section 11.1 on page 107.)
- ◇ 30 Interviews (List in Section 10 on page 99.)
- ◇ 522 Articles. (List in Section 11.3 on page 111.)
- ◇ 54 Acknowledgements. Announcements & Listings (List in Section 11.5 on page 253.)

12.4 Erdös and Bacon Numbers

- ◇ Erdös number[13] = 3
- ◇ Bacon number[14] = 2
- ◇ Erdös - Bacon number[15] = 5

[13] Here are the details.

1. Robert J. Marks II coauthored with Donald C. Wunsch.
   - D.C. Wunsch II, R.J. Marks II, T.P. Caudell and C.D. Capps, "Limitations of a class of binary phase-only filters," Applied Optics, vol. 31, no.26. pp.5681-5687 (1992).
   - D.C. Wunsch II, T.P. Caudell, C.D. Capps, R.J. Marks II and R. A. Falk, "An optoelectronic implementation of the adaptive resonance neural network," IEEE Transactions on Neural Networks, vol.4, no.4, pp.673-684 (1993).
2. Donald C. Wunsch coauthored with Frank Harary.
   - Frank Harary, Meng-Hiot Lim, Amit Agarwal, Donald C. Wunsch, "Algorithms for derivation of structurally stable Hamiltonian signed graphs," Int. J. Comput. Math. 81(11): 1349-1356 (2004)
3. Frank Harary coauthored with Paul Erdös.
   - Paul Erdös, Frank Harary and W.T. Tutte, "On the dimension of a graph," *Mathematika* 12 (1965) pp.118-122
   - Paul Erdös, Frank Harary and M. Klawe, "Residually-Complete- Graphs," Annals of Discrete Mathematics, Vol. 6, pp 117- 123 (1980).

[14] Marks was in *Expelled: No Intelligence Allowed* with Ben Stein who was in *Planes, Trains and Automobiles* with Kevin Bacon. IMDb data: http://www.imdb.com/name/nm2990293/

[15] The sum of one's Erdös and Bacon numbers

12.5 Citation Count

Citation data[16] taken from Google Scholar.[17]

- ◇ h-index[18] = 53.
- ◇ i-10 index[19] = 171.
- ◇ citations = 11,580

[16] The publications and their citations are listed in Section 13.5 on page 275.
[17] Google Scholar gives the most liberal citation counts. Counts include self citations.
[18] This means that 53 papers have been cited 53 or more times.
[19] The number of papers cited 10 or more times.

13 Appendices

13.1 Graduate Theses and Dissertations

13.1.1 Students Advised

Following is a list of graduate students with an MS thesis or a Ph.D. dissertation.

1. D. K. Smith, "Extrapolation of Two-dimensional Bandlimited Images," Thesis (1980).
2. R. C. Hickey, "An Iterative Design Technique for Computer Generated Holograms," Physics Master's Project (1982).
3. D. Radbel, "Noise and Truncation Effects in the Estimation of Sampled Bandlimited Signals," Thesis (1983).
4. C. M. Maxey, "Optical Detection of Flaws in Thirty Five Millimeter Photographic Film," Thesis (1983).
5. R. A. Spielmaker, "A Coherent Optical Implementation of an Algorithm to Restore Continuously Sampled Aliased Data," Thesis (1983).
6. K. F. Cheung, "The Generalized Sampling Expansion: Its Stability, Posedness and Discrete Equivalent," Thesis (1983).
7. D. Kaplan, "Bandlimited Signal Interpolation: Continuous and Interlaced Sampling," Thesis (1983).
8. M. H. Goldburg, "Signal Synthesis in the Presence of an Inconsistent Set of Constraints," Thesis (1984).
9. T. Reightly, Iterative evaluation of extrema of integrals of trigonometric polynomials (1985).
10. C.A. Green, Composite Matched Filters, Thesis (1987).
11. Shiao-Min Tseng, "Noise Level Analysis for Linear Restoration Algorithms," Thesis (1984).
12. M. Dadi, "A Study of Relative Efficiency in Laplace Noise," Thesis (1985).
13. H. K. Ching, "Truncation Effects on the Estimation of Two-Dimensional Continuous Bandlimited Signals," Thesis (1985).
14. W. C. Wu, "Multidimensional Window Design Using Abel Projection," Thesis (1985).
15. J. J. Choi, "A Performance Analysis of Associative Memories With Nonlinearities in the Correlation Domain," Thesis (1987).
16. H. Amindavar, "CMF Performance in the Presence of Input and Processor Noise," Thesis (1987).
17. W. S. Leung, "Use of a Liquid Crystal Television as a Programmable Spatial Light Modulator," Thesis (1987).
18. K. H. Ho, "A Monte Carlo study of fault tolerant aspects of the alternating projection neural network," Thesis (1988).
19. K. F. Cheung, "Image sampling density reduction below that of Nyquist," Dissertation (1988).
20. Dennis Sarr, "Image processing using the alternating projection neural network," Thesis (1989).
21. S. Oh, "Homogeneous alternating projection neural networks," Dissertation (1989).
22. P. Arabshahi, "Fully parallel, real-time optical architectures for superior time-frequency representations of signals," Thesis (1990).
23. D.C. Park , "Identification of stationary/nonstationary systems using artificial neural networks," Dissertation (1990).
24. J.J. Choi, "Efficient learning in artificial neural networks," Dissertation (1990).
25. Rabayrol Bruno, "Training set selection for a binary classifier artificial neural network," Practical Training for IRESTE Engineer Degree, (Nantes, France), Thesis, (1990).
26. Christophe F. Bas, "Artificial neural networks as detectors of signals corrupted with Laplace noise," Practical Training for IRESTE Engineer Degree, (Nantes , France), Thesis, (1991).
27. D. Wunsch , "An Electro-Optical Learning Machine," Dissertation, (1991).
28. J.N. Hwang, Query based learning, (1991).
29. R. Streifel, "Synthesis of time-frequency representation by the method of projections onto convex sets," Thesis (1991).
30. M.G. Meyer, "Application of the projection theorem in biomagnetic computed tomography," Thesis (1991).

31. Zhi Li, "A partial table-lookup RNS-decimal number conversion algorithm and its implementation," Dissertation (1993).
32. Payman Arabshahi , "Fuzzy Adaptive Inference in Neural Networks and Search," Dissertation (1994).
33. Piotr Czapski, "Finite Element Modeling of Magnetic Fields Resulting From the Excitation Process in the Normal and Diseased Heart," Dissertation (1995).
34. Russell Reed, "Some Aspects of Generalization in Feed-Forward Neural Networks," Dissertation (1995).
35. Robert Streifel, "Application of Computational Intelligence to Electromechanical Systems," Dissertation (1996).
36. Frank S. Holman III, "Platform Independent 2D and 3D Geometry Representation and Related Applications Using Neural Networks," Thesis (1996).
37. Sigurdur Guttormsson, "Novelty Detection of Shorted Turns in Turbo-Generator Rotors," Thesis (1997).
38. Shinhak Lee, "Projections onto Fuzzy Convex Sets and Its Application to Radiation Beam Optimization in Radio Therapy," Dissertation (1997).
39. Georgios Chrysantholopolis, "Autonomous Agents Utilying Self-Reflection, Instincts and External Behavior Learning in a Simulated Environment: Orgs in Orgland," Thesis, (1998).
40. Frank S. Holman II, "Neural Network Based Shaped Neighborhoods: A Design Retrieval System," Dissertation (1999).
41. Gorkem Kuterdem, "Automatic control of Radiation Therapy Dosage," Thesis, (1999).
42. Martin Weikart, "Dynamic Control of Radiation Therapy Dosage," Thesis, (1999).
43. Frank S. Holman III, PhD EE, "Neural Network Based Shaped Neighborhoods: A Design Retrieval System," Dissertation 1999.
44. Brian Adams, MS EE, "Automatic Decision Aggregation for Smart Cockpit Control," (MS Project), 1999.
45. Ram Balasubramanian, "The Maximally-Receptive Classifier/Regression Bank ," Thesis (2000).
46. George Chrysanthakopoulis, "A Fuzzy-Logic Autonomous Agent Applied as a Supervisory Controller in a Simulated Environment," Dissertation 2000.
47. Sreeram Narayanan , "Fast Cross-projection Algorithm for Reconstruction of Seeds," MS Thesis, 2001.
48. Jae-Byung Jung, "Neural Network Emulation of Acoustic Models," Dissertation, 2001.
49. Benjaman Thompson, "Implicit Learning in Neural Network Encoders," MS Thesis, 2002.
50. Arindam Das, "Swarm Intelligence Applications to Communications Routing," Dissertation, Summer 2003.
51. Stephen Lam, "Query Based Data Base Construction for Supervised Learning," Dissertation, 2002.
52. Jiho Park "POCS Restoration of Degraded JPEG Images," Dissertation, 2002.
53. Sreeram Narayanan , "Rapid 3D Seed Reconstruction from Incomplete Data Sets for Image Guided Prostate Brachytherapy," Dissertation, 2004.
54. Jeffrey Weinschenk, "Reducing the rule explosion in fuzzy inferencing," Dissertation (2004).
55. Benjamin B. Thompson, "Ensonification control using layered perceptrons," Dissertation (2004).
56. Matthew Trumbo, "A New Modality for Microwave Tomographic Imaging: Time Transit Tomography," Thesis (2006).
57. Firasath Riyaz, "Evolving a Disjunctive Predator Prey Swarm using PSO: Adapting Swarms with Swarms," Thesis (Computer Science) (2006).
58. Steve Maule, "Principal Component and Artificial Neural Network Calibration of a Microwave Frequency Composition Measurement Sensor," Thesis (2007).
59. Winston Ewert, "Studies of Active Information in Search," Thesis (2010).
60. George Moñtanez, "Information Storage Capacity of Genetic Algorithm Fitness Maps," Thesis (2011).
61. Benjamin Van Ruitenbeek, "Image Compression and Recovery Using Compressive Sampling and Particle Swarm Optimization," Thesis (2009)

62. Albert Yu, "Optimizing Multi-Agent Dynamics for Underwater Tactical Applications," Thesis, (2011).
63. Winston Ewert, "Algorithmic Specified Complexity" Dissertation (2013).
64. Jon Roach, "Emergent Behaviors of Multi-Objective Swarms with Applications in a Dynamic Underwater Environment," Thesis, (2013).
65. David Nemati, "An Investigation of Observed Algorithmic Specified Complexity," Thesis (2017).
66. Eric Holloway, "What Cannot Create Information, What Can, and Why It Matters," Dissertation (2017).

13.1.2 Cross Disciplinary Research

This is partial list of students worked with during undergraduate research, thesis or dissertation work in cross disciplinary research that resulting in one or more publications coauthored with the student and their advisor. The student's advisor is indicated in the square brackets at the end of the citation. Papers co-authored are listed in the publications Section 6 on page 18.

1. E.L. Kral, Optical Computing, (1978)[John Walkup]
2. S.V. Bell, Optical Computing, (1978) [John Walkup]
3. J.L. Whited, Optical Computing, (1978) [John Walkup]
4. M.I. Jones, Optical Computing, (1978) [John Walkup]
5. M.E. Aggoune, Application of Neural Networks to Power Systems, Dissertation 1989 [Mohamed El-Sharkawi]
6. J.W. Taylor, Neural Networks (1988) [Les Atlas].
7. Yunxin Zhao, Cone Shapped Kernels, (1989) [Les Atlas].
8. James W. Pitton, Time-Frequency Representations, (1990) [Les Atlas].
9. C.M. Lam, Neural Networks, (1990) [Leung Tsang]
10. S. Kitamaru, Neural Networks, (1990) [Akira Ishimaru]
11. S.Y. Chung, Power neural networks. (1991) [O. Mohammed]
12. Z. Chen, Remote Sensing, (1992) [Leung Tsang]
13. A.T.C. Chang, Remote Sensing, (1992) [Akira Ishimaru]
14. S. Weerasooriya, Security Assessment of Power System, (1992) [Mohamed El-Sharkawi].
15. C.H. Daly, Amputee prosthetic fitting, (1994) [Joan Sanders].
16. W.R. Cummings, Amputee prosthetic fitting, (1994) [Joan Sanders].
17. H.C. Lai, Biomagnetic sensing, (1994) [Ceon Ramon].
18. B.G. Song, Fuzzy Systems, (1997) [James Ritcey].
19. C.A. Jensen, Feature Selection and Inverse Problems, (1999) [Mohamed El-Sharkawi].
20. P. Peng, Load forecasting, (1999) [Mohamed El-Sharkawi].
21. A.S. Kulkarni, Shorted field rotors, (2000) [Mohamed El-Sharkawi].
22. J. Xing, Shorted field rotors, (2000) [Mohamed El-Sharkawi].
23. L.S. Moulin, Support Vector Machines in Power Engineering, (2002) [A.P.A. da Silva].
24. Ioannis N Kassabalidis, Swarm Intelligence, (2002) [Mohamed El-Sharkawi].
25. J. Schreiber, Biomagnetic imaging, (2002) [Ceon Ramon].
26. Jens Haueisen, Biomagnetic imaging, (2002) [Ceon Ramon].
27. Paul Schimpf, Biomagnetic imaging, (2002) [Ceon Ramon].
28. Seongwon Cho, Iris recognition (2004) [Jaemin Kim]
29. Jinsu Choi, Iris recognition (2004) [Jaemin Kim]
30. Paul Reynolds, "Algorithm Implementation in FPGAs Demonstrated Through Neural Network Inversion on the SRC-6e," Thesis (2005) [Russ Duren].
31. Eric Green,"Design of a microwave sensor for non-invasive determination of blood-glucose concentration," Thesis (2005) [Randall Jean].
32. Jeffrey DaCunha, "Lyapunov Stability and Floquet Theory for Nonautonomous Linear Dynamic Systems on Time Scales," Dissertation (Mathematics) (2004) [John Davis].

33. Billy Jackson, "A General Linear Systems Theory on Time Scales: Transforms, Stability and Control," Dissertation (Mathematics) (2007) [John Davis].
34. Alice Ramos, "The Dynamic Lyapunov Equation on Time Scales," Dissertation (Mathematics) (2009) [John Davis].
35. John Miller, "Stability of Simultaneously Triangularizable Switched Linear Systems on Time Scales" Thesis (ECE) 2009.
36. Ben Van Ruitenbeek, "Image Compression and Recovery Using Compressive Sampling and Particle Swarm Optimization," Thesis (Computer Science) (2009) [David Sturgill].
37. Joseph Perry, Thermal Transient Modeling in Power MOSFETs, (2009) [Charles Baylis]
38. Dylan R. Poulsen, Time Scales, (2011) [John Davis].
39. Matthew Moldovan, "Piecewise Linear Approach for Optimizing Radar Chirps," (2012) [Charles Baylis].
40. Josh Martin, "Adaptive Load Impedance Optimization for Power Amplifiers in Reconfigurable Radar Transmitters," Thesis, (2012) [Charles Baylis].
41. Oby Akinbule, Microwave optimization, (2012) [Charles Baylis].
42. Loria Wang, "Side Lobe Modulation of Radar Antenna Pattern Utilizing an Auxiliary Array," Thesis, (2012) [Charles Baylis].
43. Yanqing Liu, Wireless Communication, (2013) [Liang Dong].
44. Stuart Gibbs "Estimation of Multi-Component Mixture Proportions using Regression Machine Analysis of Ultra-Wideband Spectroscopic Measurements" (2013) [Randall Jean]
45. Matthew Gardner "Estimation of Multi-Component Mixture Proportions using Regression Machine Analysis of Ultra-Wideband Spectroscopic Measurements" (2013) [Randall Jean]
46. Brandon Herrera "Estimation of Multi-Component Mixture Proportions using Regression Machine Analysis of Ultra-Wideband Spectroscopic Measurements" (2013) [Randall Jean]
47. Chris Faulkner "Estimation of Multi-Component Mixture Proportions using Regression Machine Analysis of Ultra-Wideband Spectroscopic Measurements" (2013) [Randall Jean]
48. Adam Parks "Estimation of Multi-Component Mixture Proportions using Regression Machine Analysis of Ultra-Wideband Spectroscopic Measurements" (2013) [Randall Jean]
49. Josh Daniliuc "Estimation of Multi-Component Mixture Proportions using Regression Machine Analysis of Ultra-Wideband Spectroscopic Measurements" (2013) [Randall Jean]
50. Paul Hodge "Estimation of Multi-Component Mixture Proportions using Regression Machine Analysis of Ultra-Wideband Spectroscopic Measurements" (2013) [Randall Jean]
51. Adam Parks "Feasibility of Microwave Radar System for Proton Therapy Control" (2015) [Randall Jean]
52. Yanqing Liu "Resource Management of Cognitive Radio Networks with Optimization Methods" (2015) [Liang Dong]
53. Brandon Herrera "A Low-Cost Embedded Network Analyzer for the Measurement of Material Properties" (2015) [Randall Jean]
54. Joseph Barkate "Dynamically Reconfigurable Power Amplifier Circuit Optimization," (2016) [Charles Baylis]
55. Dylan Eustice "Adaptive Radar Waveform Synthesis via Alternating Projection," (2016) [Charles Baylis]
56. Matthew Fellows "Multidimensional Power Amplifier Circuit Optimizations for Adaptive Radar," (2017) [Charles Baylis]
57. Lucilia Hays (Lamers) "Power Amplifier Optimization Using Tunable Circuitry and Stability Analysis Methods for the Next Generation Radar," (2018) [Charles Baylis]
58. Casey Latham "Joint Circuit and Waveform Optimization for Next-Generation Radar," (2018) [Charles Baylis]
59. Zachary Hays "Circuit Modeling and Optimization Techniques for Next-Generation Radar," (2018) [Charles Baylis]
60. Sarvin Rezayat "Circuit Optimization and Frequency Agility for Cognitive Radar," (2018) [Charles Baylis]

13.2 Coauthors

Here is a list of coauthors with whom I've published.

1. Oby Akinbule
2. George Andexler
3. M.E. Aggoune
4. Gregory M. Anderson
5. Payman Arabshahi
6. Les E. Atlas
7. Yianni Attikiouzel
8. Ram Balasubramanian
9. Joseph Barkate
10. Jennifer Barlow
11. Charles Baylis
12. Christophe F. Bas
13. Michael Behe
14. S.V. Bell
15. Matthew A. Beauregard
16. Stephen Berger
17. Jacob Boline
18. C.M. Brace
19. Walter Bradley
20. C Bunje
21. C. David Capps
22. Thomas P. Caudell
23. A.T.C. Chang
24. Zhengxiao Chen
25. Kwang F. Cheung
26. Paul S. Cho
27. Seongwon Cho
28. Jai J. Choi
29. Jinsu Choi
30. Georgios Chrysanthakopoulos
31. Suk Y. Chung
32. Andrew Clegg
33. Lawrence Cohen
34. D.A. Cohn
35. Ronald Cole
36. William E. Combs
37. Jerome Conner
38. T.M. Cover
39. William R. Cummings
40. P. Czapski
41. M.I. Dadi
42. Colin H. Daly
43. Jeffrey J. DaCunha
44. Mark J. Damborg
45. Josh Daniliuc
46. Arindam Das item Ali Darwish
47. A. P. Alves da Silva
48. John M. Davis
49. Jean de Graaf
50. William A. Dembski
51. Tharam Dillon
52. Angelique Dockendorf
53. R.C. von Doenhoff
54. Liang Dong
55. Witali L. Dunin-Barkowski
56. Lawrence Dunleavy
57. Russell Duren
58. Austin Egbert
59. Mohamed El-Sharkawi
60. Christian J. Eggen
61. Dylan Eustice
62. Winston Ewert
63. R. Aaron Falk
64. Chris Faulkner
65. Matthew Fellows
66. Robert Fischl
67. Jorge Fernandez
68. Matthew Flachsbart
69. David Fogel
70. Warren L. J. Fox
71. Toshio Fukuda

72. Stuart Gibbs
73. Kyle Gallagher
74. Pedro Rodriguez-Garcia
75. Ann K. Gauger
76. Stuart Gibbs
77. Marc Goldburg
78. Bruce Gordon
79. Ian A. Gravagne
80. Andrew Gray
81. Charles A. Green
82. Eric C. Green
83. Sigurdur E. Guttormsson
84. Marion O. Hagler
85. Douglas G. Haldeman
86. Michael W. Hall
87. Zachary Hays
88. Jens Haueisen
89. Megan U. Hazen
90. Michael Healy
91. Abigail Hedden
92. Brandon Herrera
93. Paul Hodge
94. Wolfgang Hoffmann
95. Frank S. Holman III
96. F. Holt
97. T. Homma
98. M.Y. Huang
99. Steven Shyh-Jier Huang
100. Pieter J. van Heerden
101. Jenq-Neng Hwang
102. C.A. Irby
103. Akira Ishimaru
104. Billy J. Jackson
105. B. Randall Jean
106. Craig A. Jensen
107. Daniel Jepson
108. Michael I. Jones
109. Robert Jonk
110. Jae-Byung Jung
111. Mohammad Abu Khater
112. Dmitry Kaplan
113. Christopher Kappelmann
114. Ioannis N Kassabalidis
115. Mohammad Abu Khater
116. Isidor Kerszenbaum
117. Jaemin Kim
118. Mingoo Kim
119. S. Kitamura
120. E. Lee Kral
121. Thomas F. Krile
122. Ramasamy Krishnan
123. David Krout
124. Amol S. Kulkarni
125. H. Görkem Kuterdem
126. Richard Ladner
127. H.C. Lai
128. Chi M. Lam
129. Steve T Lam
130. Lucilia Lamers
131. Ellie Langley
132. J.N. Larson
133. Steven Lardizabal
134. Casey Latham
135. Loren Laybourn
136. Gordon Ledford
137. Kwang Y Lee
138. Shinhak Lee
139. Michael Lexa
140. Zhi Li
141. C.S. Lim
142. Yanqing Liu
143. Alan Lippman
144. C.G. Looney
145. Alicia Magee

146. T. P. Mann
147. Kirk Marquard
148. Josh Martin
149. Anthony Martone
150. J.G. McDonnell
151. M.G. Meyer
152. John E. Miller
153. Hunter Miller
154. Robert T. Miyamoto
155. Osama Mohammed
156. Matthew Moldovan
157. George Montañez
158. David Moon
159. Hiroyuki Mori
160. L. S. Moulin
161. Yeshwant Muthusamy
162. Sreeram Narayanan
163. D. Nguyen
164. V. Bogdan Neculaes
165. Aghogho Obi
166. Seho Oh
167. Marimuthu Palaniswami
168. Yoh-Han Pao
169. Alex Papalexopoulos
170. Dong Chul Park
171. Jiho Park
172. Adam Parks
173. Homayoon Parsaei
174. John Penn
175. Dimitrios Peroulis
176. Joseph Perry
177. Hal Philipp
178. Mark H. Phillips
179. James W. Pitton
180. William Platt
181. M.C. Poon
182. H.Vincent Poor
183. D.R. Poulsen
184. Dmitry Radbel
185. Ceon Ramon
186. Alice A. Ramos
187. Russell D. Reed
188. Tonya Reightley
189. Sarvin Rezayat
190. A.J. Rocha Reis
191. Sarvin Rezayat
192. Grant Richter
193. James C. Ritcey
194. Jon Roach
195. C.J. Robinson
196. Alberto Rodriguez
197. Alonso Rodriguez
198. Pedro Rodriguez-Garcia
199. Benjamin Van Ruitenbeek
200. Fariborz Salamat
201. Joan E. Sanders
202. Frank Sanders
203. Iwan Njoto Sandjaja
204. Edgar Sánchez-Sinencio
205. John Sanford
206. Dennis P. Sarr
207. Hiroshi Sasaki
208. Paul Schimpf
209. J. Schreiber
210. Abbas Semnani
211. David K. Smith
212. Michael J. Smith
213. Wesley E. Snyder
214. Mani Soma
215. Arun Somani
216. B.G. Song
217. Michael Z. Spivey
218. David Sturgill
219. Robert J. Streifel

220. J.W. Taylor
221. J.A. Thomas
222. Benjamin B. Thompson
223. Leung Tsang
224. Alexander Tsatsoulas
225. Shiao-Min Tseng
226. Matthew L. Trumbo
227. Alexander Tsatsoulas
228. Pieter J. van Heerden
229. S. Verdu
230. John L. Vian
231. Ed Viveiros
232. Eric Walden
233. John F. Walkup
234. Jack M. Webster
235. S.Weerasooriya
236. Jeffrey J. Weinschenk
237. John L. Whited
238. Wen-Chung Stewart Wu
239. Michael Wicks
240. Donald C. Wunsch II
241. P.J. Van Heerden
242. Jian Xing
243. H.J. Youn
244. Albert R. Yu
245. Yunxin Zhao
246. Jacek Zurada

13.2.1 Publications with Nationals

Here is a list of some co-authors not born in the United State. Some have since become US citizens. Only one entry per country is given.

1. Argentina (Isidor Kerszenbaum)
2. Australia (Yianni Attikiouzel)
3. Brazil (A. P. Alves da Silva)
4. Canada (Winston Ewert)
5. China (Steven Shyh-Jier Huang)
6. Egypt (Mohamed El-Sharkawi)
7. India (Ram Balasubramanian)
8. Iran (Payman Arabshahi)
9. France (Christophe F. Bas)
10. Germany (Wolfgang Hoffmann)
11. Greece (Georgios Chrysanthakopoulos)
12. Iceland (Sigurdur E. Guttormsson)
13. Hong Kong (Kwang F. Cheung)
14. Indonesia (Iwan Njoto Sandjaja)
15. Japan (Toshio Fukuda)
16. Korea (Seho Oh)
17. Lebanon (M.E. Aggoune)
18. Mexico (Edgar Sánchez-Sinencio)
19. Nigeria (Oby Akinbule)
20. Poland (Jacek Zurada)
21. Romania (Josh Daniliuc)
22. Russia (Witali L. Dunin-Barkowski)
23. Taiwan (Wen-Chung Stewart Wu)
24. Turkey (H. Görkem Kuterdem)
25. Ukraine (Dmitry Radbel)
26. Vietnam(Steve T. Lam)

13.3 Journals

Here are journals in which publications appear.

1. Analog Integrated Circuits and Signal Processing,
2. Applied Optics
3. Bio-Complexity
4. Canadian Applied Mathematics Quarterly
5. Circuits, Systems, and Signal Processing
6. Computational Science and Engineering
7. Connections: Newsletter of the IEEE Neural Networks Council
8. Electronic Journal of Differential Equations
9. Engineering Intelligent Systems
10. IEEE Circuits and Devices Magazine
11. IEEE Computational Intelligence Magazine

12. IEEE Microwave Magazine
13. IEEE Power Engineering Review
14. IEEE Transactions on Acoustics, Speech and Signal Processing
15. IEEE Transactions on Aerospace and Electronic Systems
16. IEEE Transactions on Biomedical Engineering
17. IEEE Transactions on Circuits and Systems
18. IEEE Transactions on Circuits and Systems I: Regular Papers
19. IEEE Transactions on Electromagnetic Compatibility
20. IEEE Transactions on Energy Conversion
21. IEEE Transactions on Geoscience and Remote Sensing
22. IEEE Transactions on Image Processing
23. IEEE Transactions on Instrumentation and Measurement
24. IEEE Transactions on Fuzzy Systems
25. IEEE Transactions on Neural Networks
26. IEEE Transactions on Power Engineering
27. IEEE Transactions on Power Systems
28. IEEE Transactions on Signal Processing
29. IEEE Transactions on Systems, Man and Cybernetics: Systems
30. IEEE Transactions on Systems, Man and Cybernetics A, Systems and Humans
31. IEEE Transactions on Systems, Man and Cybernetics, Part B: Cybernetic
32. IEE Proceedings-C
33. IET Computer Vision
34. IET Radar, Sonar & Navigation
35. International Journal of Dynamical Systems and Differential Equations
36. International Journal of Information Technology and Intelligent Computing
37. International Journal of Microwave and Wireless Technologies
38. International Journal of Swarm Intelligence and Evolutionary Computation (IJSIEC)
39. International Journal of Tomography & Statistics
40. Journal of Advanced Computational Intelligence and Intelligent Informatics
41. Journal of The American Scientific Affiliation: Perspectives on Science and Christian Faith
42. Journal of the International Measurement Confederation (Measurement)
43. Journal of Clinical Engineering
44. Journal of Mathematical Analysis and Applications
45. Journal of the Optical Society of America
46. Journal of the Optical Society of America A
47. Journal of VLSI Signal Processing Systems
48. Mathematical and Computer Modelling
49. Measurement (Journal of the International Measurement Confederation)
50. Medical Physics
51. Neurocomputing
52. Neural Networks
53. Optical Engineering
54. Optics Letters
55. Perspectives on Science & Christian Faith
56. Phys. Med. Biol.
57. Proceedings of the IEEE

13.4 Venues

Conference, presentations and similar activities from a geographical perspective. Only one activity per city is listed.

Australia

1. Perth - IEEE International Conference on Evolutionary Computation, Perth, Australia. November 26-30, 1995.
2. Sydney - 2013 IEEE International Conference on Ultra-Wideband (ICUWB), Sydney Australia, September 15-18,2013.

Austria

3. Graz - Power Systems Computation Conference, Graz, Austria (August 19-24, 1990)

Brazil

4. Florianopolis - "Modern Neural Networks: The First Decade," IV Escola de Redes Neurais, Florianopolis , Brazil, July 21, 1997.

Canada

5. Alberta - Calgary - Eighth Canadian Biennial Conference, Canadian Society for Biomechanics, Calgary, August 18-20, 1994
6. Quebec City - Quebec - Fourteenth Congress of the International Commission for Optics, Quebec City, Quebec Canada, August 24-28, 1987.
7. British Columbia - Vancouver - IEEE International Conference on Systems, Man and Cybernetics, Vancouver, British Columbia, Canada, October 22-25, 1995
8. Hamilton - Ontario - CSCA/ASA/CiS 2014 Conference, McMaster's University
9. Ottawa - 2013 IEEE Radar Conference (RADAR), Ottawa, ON, Canada, April 29-May 3 2013
10. Victoria - IEEE Pacific Rim Conference on Communications, Computers and Signal Processing, Victoria, B.C. Canada, June 4-5, 1987.

China

11. Beijing - International Joint Conference on Neural Networks, Beijing, November 3-6, 1992.
12. Chengdu - "Computational Intelligence: A Free Source of Information?" International Symposium on Neural Networks (ISNN), Chengdu, China (May 29, 2006)
13. Hong Kong - 1989 International Symposium on Computer Architecture and Digital Signal Processing (Hong Kong Convention and Exhibition Centre, 11-14 October, 1989),
14. Nanjing - International Conference on Circuits and Systems, July 6-8, 1989, Nanjing, China
15. Shanghai - IEEE Wireless Communications and Networking Conference (WCNC), Shanghai, China, 7-10 April 2013
16. Wuhan - Sixth International Symposium on Neural Networks (ISNN 2009) Wuhan, China, May 26-29, 2009

England

17. London - 1978 International Computing Conference, London, England, 1978

Finland

18. Espoo - 1991 International Geoscience and Remote Sensing Symposium, 3-7 June 1991, Espoo, Finland.
19. Helsinki - 1988 IEEE International Symposium on Circuits and Systems, pp. 503-506, Helsinki, 7-9 June, 1988.

France

20. Carry-le-Rouet - 1997 IEEE International Symposium on Diagnostics for Electrical Machines, Power Electronics and Drives, (SDEMPED '97), Carry-le-Rouet, France, September 1-3, 1997,
21. Montpellier - International Conference on Intelligent System Application to Power Systems, Montpellier, France, September 5-9, 1994.
22. Nantes - "Artificial Neural Systems," Ireste University in Nantes France, March 5-30, 1990 .
23. Paris - IEEE/IAFE [International Association of Financial Engineers] Computational Intelligence in Financial Engineering, (CIFEr). Paris, France, April 11-15, 2011.
24. Toulouse - 19th AIAA Int. Communications Satellite Systems Conf., 17-20 April 2001, Toulouse, France.

Germany

25. Heidleberg - International Conference on the Use of Computers in Radiation Therapy XIII, Heidleberg, Germany (May 22-25, 2000)
26. Munich - IEEE Nanotechnology Council Meeting
27. Duisburg, "A signal space interpretation of neural network associative memories and classifiers" at the University of Duisburg, W. Germany, May 31, 1988.

Hungary

28. Budapest - IEEE ISAP2001, Budapest, Hungary, June 18-21,2001

Italy

29. Capri - International Optical Computing Conference, Capri, Italy, September 1976
30. Como - 2000 Como , Italy IJCNN, July 24-27, 2000 .
31. Florence - 30th International Symposium on Automotive Technology and Automation, Dedicated Conference on Megatronics, Florence Italy, 16-19 June 1997

32. La Spezia - Impact of Environmental Variability on Acoustic Predictions and Sonar Performance (N. G. Pace and F. B. Jensen, eds.),16-20 September 2002, Lerici, La Spezia, Italy,Sept. 2002.
33. Sorrento - 1994 International Conference on Artificial Neural Networks May 26-29, 1994, Sorrento, Italy.
34. Tuscany - "Evolution Models Do Not Create Information," Great Expectations Conferences, Borgo Finocchieto, Tuscany, Italy, June 12-16, 2011
35. Venice - 1996 IEEE International Workshop on Neural Networks for Identification, Control, Robotics and Signal/Image Processing (NICROSP), September 21-23, 1996, Venice, Italy

Japan

36. Nagoya - Second International Forum on Applications of Neural Networks to Power Systems , Nagoya, Japan, 1993;
37. Tokyo - IEEE-IECEJ-ASJ International Conference on Acoustics, Speech and Signal Processing, Tokyo, Japan, March 1986.
38. Tsukuba - 1993 IEEE/Tsukuba International Workshop on Advanced Robotics, November 8-9, 1993, AIST Tsukuba, Japan
39. Yokohama - International Conference on Fuzzy Systems (FUZZ-IEEE), Yokohama, Japan, March 20-24, 1995.

Latfia

40. Jurmala - 1995 Workshop on Sampling Theory & Applications, September 20-22, 1995 , Jurmala (Riga), Latvia

Mexico

41. Cancun - IEEE Technical Activities Board (TAB) 1999
42. Mexico City - IEEE TAB Symposium

Monaco

43. Monaco - "Artificial Neural Networks in Electric Power Systems," Decisions Systems International, Monaco, July 1-3, 1991

New Zealand

44. Dunedin - New Zealand International Two-Stream Conference on Artificial Neural Networks and Expert Systems (ANNES) November 24-26, 1993, Otage University, Dunedin, New Zealand

Poland

45. Gliwice - Faculty Fellowship, March 31, 2003 "Scientists and God: The Myth of Incompatibility"
46. Krakow - Faculty Fellowship, April 1, 2003 "Fuzzy Union Rule Configuration: Avoiding Exponential Rule Explosion".
47. Szczyrk - Second Conference of Neurl Networks and Their Applications, 1996
48. Wroclaw - "Perceptron Inversion: Properties and Applications", Institute of Engineering Cybernetics, Wroclaw University of Technology, Wroclaw, Poland (April 3, 2003).

Russia

49. Moscow - "Moscow Airport Encounters," University ofWashington EE News, March 1993, Volume 4, Number 2, p.8.
50. Rostov-on-Don - 1992 RNNS/IEEE Symposium on Neuroinformatics and Neurocomputing, Rostov-on-Don, Russia, October 7- 10, 1992.
51. Ulan-Ude - "Neural Networks: The Fundamentals," Buryat State University, Ulan-Ude, Russia, March 5, 2001.

Singapore

52. Singapore - 1991 International Joint Conference on Neural Networks, Singapore, November 18-21 (1991).

South Korea

53. Seoul - International Conference on Intelligent Systems Applications to Power Systems (ISAP), Seoul, Korea, July 6-10, 1997.

Ukraine

54. Crimea - Information Processing by Neural Networks, (IP+NN ' 97), October 10-17, 1997, Ukraine, Crimea, Gurzuf Russian Academy of Science, Russian Neural Network Society, International Academy of Computer Scienc

Spain

55. Barcelona - International Workshop on Arti cial Neural Networks (IWANN ' 93), June 9-11, 1993, Barcelona
56. Madrid "Artificial Neural Networks in Electric Power Systems," Decisions Systems International, Madrid, Spain , September 7-11, 1992

United States

Alabama

57. Auburn - First Workshop on Neural Networks: Academic/Industrial/NASA/Defense, Auburn University and Conference Center, 4-6 February, 1990, Auburn, Alabama

58. Huntsville - SPIE Symposium/Workshop on the Effective Utilization of Optics in Radar Systems, Huntsville, Alabama, September 1977.

Alaska

59. Anchorage - 1998 IEEE International Conference on Evolutionary Computation (ICEC) at the 1998 IEEE World Congress on Computational Intelligence, Anchorage, Alaska, May 5-9, 1998

Arizona

60. Scottsdale - IEEE International Symposium on Circuits and Systems, Scottsdale, Arizona, May 26-29, 2002

61. Tempe - Microwave Measurement Symposium (ARFTG). Tempe, Arizona. 2011 78th ARFTG 1-2 Dec. 2011.

62. Tucson - Optical Society of America, Annual Meeting, Tucson, Ariz ., Oct. 19-22, 1976.

63. Phoenix - International Microwave Symposium, May 22, 2015

California

64. Los Angeles - O-E/LASE '88 Conference on Neural Network Models for Optical Computing, Los Angeles, January 1988

65. Monterey - Proceedings of the Twenty Fourth Asimomar Conference on Signals, Systems and Computers, 5-7 November, 1990, Asilomar Conference Grounds, Monterey, California.

66. Napa Valley - Pacific Gas & Electric R&D Electric Distribution Program External Advisory Goup Meeting, Silverado Country Club, Napa Valley , California , (August 22-23, 1991).

67. Pasadena - IEEE CAS Workshop on Wireless Communications and Networking, Pasadena, CA, Sept. 5-6, 2002.

68. Santa Barbara - "Evolutionary Simulations and Sources of Active Information," Discovery Retreat, Santa Barbara, CA (March 1-4, 2011)

69. San Diego - IEEE First International Conference on Neural Networks, San Diego, June 1987

70. San Francisco - Second IEEE International Conference on Fuzzy Systems (FUZZ-IEEE '93), San Francisco, March 1993

71. San Jose - "What Does Calculus Have to Do With Christianity?" San Jose State University, November 30, 2003.

72. San Mateo - International Conference on Acoustics, Speech and Signal Processing, San Mateo, CA, 1987.

Colorado

73. Boulder - 74th ARFTG (Automatic RF Techniques Group) Microwave Measurement Symposium, December 1st - 4th, 2009, Broomfield/Boulder, Colorado

74. Denver - IEEE International Joint Conference on Neural Networks, San Diego, July 24-27, 1988

75. Gold Lake - Workshop on Optical Arti cial Intelligence, Gold Lake , Colorado (3-5 August, 1987),

Florida

76. Jacksonville - 2012 44th Southeastern Symposium on System Theory (SSST), Jacksonville, Fla pp.18-23, 11-13 March 2012.

77. Miami - INFOCOM 2005. 24th Annual Joint Conference of the IEEE Computer and Communications Societies. March 2005 Miami, Fla

78. Orlando - IEEE World Congress on Computational Intelligence, June 26 - July 2,1994 Walt Disney World Dolphin Hotel, Orlando, Florida.

79. Tampa - IEEE 15th Annual Wireless and Microwave Technology Conference (WAMICON)

Georgia

80. Atlanta - Symposium on Dyagnostics for Electric Machines, Power Electronics and Drives, Atlanta, GA 24-26 August 2003

Hawaii

81. Honolulu - 2002 International Joint Conference on Neural Networks, 2002 IEEE World Congress on Computational Intelligence, May12-17, 2002, Honolulu

82. Kauai - 2012 International Waveform Diversity & Design Conference

Indiana

83. Terre Haute - Rose-Hulman Institute of Technology Outstanding Young Alumni Award Cermony
84. West Lafayette, Purdue University, ARL Joint Research Review, October 2016.

Illinois

85. Chicago - Faculty leadership conference, Campus Crusade for Christ, June 1997.

Iowa

86. Perry - "Added Information in Targeted Evolutionary Search", Perry Conference, Hotel Pattee, Perry, Iowa, April 17-20, 2006.

Louisiana

87. New Orleans - 113th Annual Meeting of the American Mathematical Society (AMS), New Orleans, January 5-7, 2007.

Maryland

88. Adelphi - "SDRadar Kick-off Meeting," U.S. Army Research Laboratory, June 2018
89. Annapolis - "Spectrum Issues in Amplifier Design," Fifth Annual Emerging Spectrum Technology (EST) Workshop on Advanced Radar Technologie to Improve Spectrum Use, Double Tree Hotel, Annapolis Maryland, September 13-14, 2010
90. Baltimore - International Conference on Neural Networks, June 1992.
91. College Park - 2012 ONR University/Laboratory Initiative Program Review, University of Maryland University, College Park, June 5-7, 2012
92. Hyattsville - 2012 University Laboratory Initiative Program Review, 5-7 June

Massachusetts

93. Boston - 1995 Design Engineering Technical Conferences, American Society of Mechanical Engineers (ASME), Boston Massachusetts, September 17-20, 1995.
94. Cambridge - 1989 IEEE International Conference on Systems, Man and Cybernetics, (Hyatt Regancy, Cambridge, Massachusetts, 14-17 Nov. 1989),

Michigan

95. Mackinac Island - Limits of Passive Imaging Workshop, Mackinac Island, MI, pp.45-55, May 24-26, 1983
96. Dearborn - "Homogeneous and layered alternating projection neural networks," The International Symposium on Optical Engineering and Industrial Sensing for Advanced Manufacturing Technologies held at the Dearborn Hyatt, Michigan, June 26-30, 1988.

Minnesota

97. Minneapolis - IEEE Power Engineering Systems 1990 Summer Meeting, Minneapolis, Minnesota, 15-19 July 1990.

Mississippi

98. Biloxi - Oceans '02 MTS/IEEE, Biloxi, Mississippi

Missouri

99. Columbia - "Conservation of Information in Evolutionary Search Algorithms: Measuring the Cost of Success," University of Missouri, Columbia, (November 12, 2007). IEEE CIS Distinguished Lecture for Columbia Chapter of IEEE CIS Society.
100. Rolla - "Time Scale Discrete Fourier Transforms," Guest Lecture, Missouri University of Science and Technology, Rolla, Mo., April 14, 2010.
101. St. Louis - Artificial Neural Networks in Engineering, (ANNIE 95), Artificial Neural Networks, Fuzzy Logic and Evolutionary Programming for Designing Smart Engineering Systems, November 12 - 15, 1995, Marriott Pavilion Hotel, St. Louis, Missouri

Nebraska

102. Lincoln - University of Nebraska-Lincoln Math Symposium, December 7, 2007

New York

103. Ithaca, Information & Biology, Cornell, University, Spring 2011
104. New York - IEEE Conference on Computational Intelligence for Financial Engineering & Economics (CIFEr) April 9-11, 1995
105. Rochester - 1977 Optical Society of America Annual Meeting, Rochester, NY

North Carolina

106. Research Triangle Park - IEEE Virtual Reality Annual International Symposium (VRAIS) 1995 Research Triangle Park, NC

107. Indian Trail, North Carolina. 30th Annual National Conference on Christian Apologetics, October 11-12 2013 First Baptist Church Indian Trail.

108. Matthews, North Carolina. 2013 Ratio Christi Symposium, Southern Evangelical Seminary, October 12-13 2013

Oklahoma

109. Winston Ewert, William A. Dembski, Robert J. Marks II, Algorithmic Specified Complexity, in Engineering and Metaphysics, Tulsa, OK, 2012.

Oregon

110. Portland - 1989 IEEE International Symposium on Circuits and Systems, 9-11 May 1989, Portland

Pennsylvania

111. Philadelphia - International Symposium on Circuits and Systems, pp.370-376, Philadelphia, May 1987.

Rhode Island

112. Newport - ONR University/Laboratory Initiative in Undersea Weapons Technology at the Naval Undersea Warfare Center (NUWC), Newport, RI (June 2-4, 2009).

South Carolina

113. Clemson - NSF Workshop on Applications of Artificial Neural Network Methodology in Power Systems Engineering, April 8-10, 1990, Clemson University

Tennesee

114. Nashville - IEEE/IAFE [International Association of Financial Engineers] Computational Intelligence in Financial Engineering, (CIFEr). Nashville, TN, March 30-April 2, 2009,

Texas

115. Arlington - "Lessons from Gödel, Turing and Chaitin: Things Computational Intelligence Will Never Do," IEEE MetroCon 2009, Innovating for Society, August 17th, 2009, Sheraton Arlington, Arlington, Texas.

116. Austin - "Science & Christianity: Separate but Equal?" Covenant Presbyterian Church, Austin, TX (August 16, 2009)

117. El Paso - 2014 Expert Witness, Ysleta del Sur Pueblo (Federal Court)

118. College Station - "THE GOD DIALOGUES II: A Panel Discussion," Texas A&M University, College Station, TX. October 27, 2011, Sponsored by Ratio Christi (Debate between Muslim, Atheist and Christian views of God.)

119. Dallas - 1990 IEEE Ap-S International Symposium and URSI Radio Science Meeting, 7-11 May, 1990, Dallas, Texas.

120. El Paso - 2014 U.S. District Court, Western District of Texas (Expert Witness)

121. Lubbock - 1977 Midwest Symposium on Circuits and Systems, Texas Tech University, Lubbock, August 1977.

122. Houston - INTERNATIONAL CONFERENCE ON NEURAL NETWORKS (ICNN'97) Westin Galleria Hotel, Houston, Texas, USA, June 9-12, 1997, "Neural Networks: Reduction to Practice"

123. Leakey, "2013 Communio: A Retreat for Faculty (Baylor University)" Laity Lodge, May 20-24, 2013

124. Plano - "God Ever Geometrizes: Apologetics in Mathematics," Probe Ministries, Plano, Texas, (June 28, 2010).

125. San Antonio - IEEE Globecom 2001, Nov. 25-29, 2001 , San Antonio , Texas.

126. Tyler - 42nd Meeting of the Southeastern Symposium on System Theory, University of Texas at Tyler, March 7-9, 2010

127. Waco - 2013 Texas Symposium on Wireless & Microwave Circuits & Systems, Waco, Texas, April 4-5, 2013.

Virginia

128. Arlington, Virginia. 2015 IEEE International Radar Conference (RadarCon), Crystal City, May 10, 2015

129. Crystal City, Virginia. DARPA Radar/ Communications Co-Design Challenge, DARPA, (April 27, 2015)

130. Vienna, Virginia. "Power Amplifier Circuit and Waveform Optimization for Reduced Spectral Spreading in Radar Transmitters," IDGA's 4th Annual Military Radar Summit, Feb 8-10, 2011, Vienna, VA

131. Crystal City, Virginia. NSF Review Panel.

West Virginia

132. Morgantown - WVU Neural Network Symposium, West Virginia University , Morgantown, (15-16 June, 1989).
133. Davis - Origin of Biological Information, Canaan Valley Resort Aug 19-21, 2016

Utah

134. Salt Lake City - XII International Conference on the Use of Computers in Radiation Therapy, May, 1997, Salt Lake City .

Washington DC

135. Washington DC - 1980 International Computing Conference, Washington D.C., April 1980

Washington

136. Ballard - American Pioneer Corporation, Ballard (consulting)
137. Bellevue - Fuzzy Logic & Intelligent Systems Seminar, Boeing Computer Services, Red Lion Inn, Bellevue, WA, December 2, 1991,
138. Cle Elum - CSC Research Retreat, May 2018
139. Everett - John Fluke Manufacturing Company Inc., Everett, WA (consulting)
140. Kirkland - Financial Neural Networks, Inc., Kirkland, WA (consulting)
141. Redmond - Microsoft Corporation, Redmond, WA (consulting)
142. Richland - Workshop on Enviornmental and Energy Applications of Neural Networks, Richland, Washington, 30-31 March 1995
143. Seattle - IEEE International Joint Conference on Neural Networks, San Diego, July 24-27, 1988

13.5 Citation List

This list is from Google and forms the basis for the h-index and i-10 index statistics in Section 12.5 on page 260. Most highly cited papers are listed first.

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158. Prostate brachytherapy seed segmentation using spoke transform ; 11 citations, 2001 - S Lam, RJ Marks, PS Cho Medical Imaging 2001: Image Processing 4322, 1490-1501
159. Location of operating points on the dynamic security border using constrained neural network inversion ; 11 citations, 1997 - CA Jensen, RD Reed, MA El-Sharkawi, RJ Marks II Proc. Int. Conf. Intelligent Systems Applications to Power Systems,(ISAP97)
160. Layered perceptron versus Neyman-Pearson optimal detection ; 11 citations, 1991 - CF Bas, RJ Marks Neural Networks, 1991. 1991 IEEE International Joint Conference on, 1486-1489
161. An adaptively trainable neural network algorithm and its application to electric load forecasting ; 11 citations, 1991 - DC Park, O Mohammed, MA El-Sharkawi, RJ Marks Neural Networks to Power Systems, 1991., Proceedings of the First
162. Query based learning in a multilayered perceptron in the presence of data jitter ; 11 citations, 1991 - S Oh, RJ Marks, MA El-Sharkawi Neural Networks to Power Systems, 1991., Proceedings of the First
163. Classification boundaries and gradients of trained multilayer perceptrons ; 11 citations, 1990 - JN Hwang, JJ Choi, S Oh, RJ Marks Circuits and Systems, 1990., IEEE International Symposium on, 3256-3259
164. The effect of stochastic interconnects in artificial neural network classification ; 11 citations, 1988 - RJ Marks, LE Atlas, DC Park, S Oh Proceedings of the IEEE International Conference on Neural Networks 2, 437-442
165. Composite matched filter output partitioning ; 11 citations, 1987 - RJ Marks, JA Ritcey, LE Atlas, KF Cheung Applied optics 26 (11), 2274-2278
166. Iterative coherent processor for bandlimited signal extrapolation ; 11 citations, 1980 - RJ Marks, DK Smith 1980 Intl Optical Computing Conf I 231, 106-112
167. The smith tube: Selection of radar chirp waveform bandwidth and power amplifier load impedance using multiple-bandwidth load-pull measurements ; 10 citations, 2014 - M Fellows, M Flachsbart, J Barlow, C Baylis, RJ Marks Wireless and Microwave Technology Conference (WAMICON), 2014 IEEE 15th
168. Comparison of algorithms for intensity modulated beam optimization: projections onto convex sets and simulated annealing ; 10 citations, 1997 - PS Cho, S Lee, II Marks, S Oh Proceedings of the XIIth International Conference on the Use of Computers in
169. Adaptation of fuzzy inferencing: A survey ; 10 citations, 1993 - P Arabshahi, RJ Marks II, TP Caudell Proceedings of the IEEE/Nagoya University WWW on Learning and Adaptive
170. Method and apparatus for identifying that one of a set of past or historical events best correlated with a current or recent event ; 10 citations, 1990 - PJ Van Heerden, JM II Robert, S Oh US Patent 4,939,683
171. Neural net associative memories based on convex set projections ; 10 citations, 1987 - KF Cheung, S Oh, RJ Marks II, LE Atlas Proceedings of the IEEE First International Conference on Neural Networks

13.6 Selected Citation Quotes

13.6.1 The Piecewise Isoplanatic Approximation

R.J. Marks II and T.F. Krile, "Holographic representations of space-variant systems: system theory," Applied Optics, vol. 15, pp.2241-2245 (1976).

1. B.E.A. Saleh and Mark O. Freeman, "Optical Transformation," in Optical Signal Processing, edited by Joseph L. Horner, Academic Press, Inc. San Diego, CA, 1987,p.315

   > "Techniques have been developed by Walkup, Marks, and their co-workers whereby a shift-invariant transformation can be separated into a number of discrete operations. These include approximating the shift-variant kernel by a piecewise isoplanatic function (*i.e.* piecewise shift-invariant), expanding the input function on an orthonormal basis, and a technique based on shift-variant sampling theory."

13.6.2 Space Variant Sampling Theory

1. A. VanderLugt, "Optimum Sampling of Fresnel Transforms," Applied Optics, Vol. 29, No. 23, pp.3352-3361, 1990;

   > "Little attention was given ... until the 1970's. Marks *et al.* [9] subsequently applied similar analysis to space-variant systems."

2. B.E.A. Saleh and Mark O. Freeman, "Optical Transformation," in *Optical Signal Processing*, edited by Joseph L. Horner, Academic Press, Inc. San Diego, CA, 1987, p.315;

   > "Marks *et.al.* have derived a generalized sampling theorem that gives the analogous rate necessary for dealing with shift-variant operations. Briefly, for the 1-D case, if the input has bandwidth W_1 and the shift variant kernel has a variational bandwidth of W_v, then if the input is sampled at points spaced by $1/2W$ where $W = W_1 + W_v$, then a shift variant transform takes on the form "

3. Shing-Hong Lin, *et.al.*, "Piecewise isoplanatic modeling of space-variant linear systems," Journal of the Optical Society of America A, Vol. 4, No. 3, pp.481-487, 1987

   > "...for bandlimited inputs, a space-variant linear system can exactly be characterized by knowledge of the sampled system point spread function and the corresponding sampled input [1-2].' ...the relationship of the *variation bandwidth* [1] to the new measure of invariance is mentioned to support the validity of the new measure."

4. A.J. Jerri, "The Shannon Sampling Theorem - Its Various Extensions and Applications: A Tutorial Review," Proceedings of the IEEE, vol.65, no.11, pp.1565-1596 (1977)

   > "Marks, Walkup and Hagler [187] developed a sampling expansion which is applicable to the class of linear space-variant systems characterized by sufficiently slowly varying line-spread functions. They showed that the desired sampling rate is determined by both the system and the input and that the corresponding output is band-limited."

5. R.F. Carson *et al.*, "Incoherent optical processing: a tristimulus-based method," Applied Optics, vol.23, no.18, pp.3138-3143 (1984)

   > "Sampling techniques for space variant systems developed Marks *et al.* allow these integrals to be approximated in sampled form as $\cdots$"

13.6.3 Ambiguity Function Display

R.J. Marks II, J.F. Walkup and M.O. Hagler, "Ambiguity function display: an improved coherent processor," Applied Optics, vol. 16, pp.746-750 (1977).

1. Gary K. Froehlich *et al.*, "A Set of Optical Information Processing Experiments," IEEE Transactions on Education, Vol. E-21, No. 1, 4-7, 1978;

   " *An Example Project: Ambiguity Function Display.* As an example of the type of project included in this report, this recently developed application of a one-dimensional coherent optical processor is presented [15].

2. Cristóbal, Gabriel, Consuelo Gonzalo, and Julián Bescós. "Image filtering and analysis through the Wigner distribution." Advances in Electronics and Electron Physics Series 80 (1991): 309-397.

   "(Marks 1977) developed a very simple processor which displays simultaneously all values of the AF corresponding to 1-D signals. This processor is shown in Figure 3.8. It requires two identical 1-D transparencies of the temporal signal $f(t)$ in the plane P1, each rotated 45 in such a manner as to form the product

   $$s(t) = f[(t+\tau)/\sqrt{2}]f^*[(t-\tau)/\sqrt{2}]$$

   where t is the time variable and τ represents a time shift. Then, the lens L1 performs the 1-D Fourier transform of the coherently illuminated transmittance in the horizontal direction, and imaging this transform along the vertical direction. In this way, the squared modulus of the AF is displayed in the plane P2."

   "The optical setup is based in that presented by Marks et al.(1977) (Fig. 3.8). Since in this case the filtered image is retrieved, the replication of that scheme is required. Some of the results obtained through this setup are shown in the Figure 4.1. The input test is a square wave signal, the filters used are shown in the middle part of the figure, and, in the lower part, the two filtered images are presented. These retrieved images have been obtained by applying the inverse property in the output plane. This method cannot be generalized to 2-D images."

13.6.4 Phase Coded Reference Beams

T.F. Krile, R.J. Marks II, J.F. Walkup and M.O. Hagler, "Holographic representations of space - variant systems using phase-coded reference beams," Applied Optics, vol. 16, pp.3131-3135 (1977).

1. W.T. Rhodes, "Space-Variant Optical Systems and Processing," in Applications of Optical Fourier Transforms, (Academic Press, 1982), pp.333-369

   "An alternate holographic multiplexing method [26] that overcomes this limitation on 2D space variant processing exploits the associative memory characteristics of holograms. As before, a multiple exposure hologram is recorded $\cdots$"

13.6.5 Shift Variant Sampling Theory

R.J. Marks II, J.F. Walkup and M.O. Hagler, "Sampling theorems for linear shift-variant systems," IEEE Transactions on Circuits and Systems, vol. CAS-25, pp.228-233 (1978).

1. David C. Munson, Jr., "Minimum Sampling Rates for Linear Shift-Variant Discrete-Time Systems," IEEE Transactions on Acoustics, Speech and Signal Processing, Vol. ASSP-33, No. 6, pp.1556-1561, 1985

   "An important consideration in implementing a linear shift-variant discrete time system is the required sampling rate $\cdots$ Marks *et al.* have derived sampling theorems for shift-variant systems and their work provides sufficient sampling rates [4,5]."

13.6.6 Optimal Detection in Laplace Noise

R.J. Marks II, G.L. Wise, D.G. Haldeman and J.L. Whited, "Detection in Laplace noise," IEEE Transactions on Aerospace and Electronic Systems, vol. AES-14, pp.866-872 (1978).

1. M. W. Thompson, D. R. Halverson and G. L. Wise. "Robust Detection in Nominally Laplace Noise." IEEE Transactions on Communications, Volume 42 Issue 2-4, pp. 16511660, FebApr. 1994

   > "Marks, Wise, Haldeman and Whited have derived exact expressions for the test statistic distribution functions, and thus were able to analyze the performance of the optimal detector for given values of signal strength and sample size."

2. C.W. Helstrom, "Detectability of signals in Laplace noise," IEEE Transactions on Aerospace and Electronic Systems, Vol.AES-25, no.2, pp.190-196 (1989)

   > " Marks, Wise, Haldeman and Whited [2] derived a closed-form expression for the complementary cumulative probability distribution Their formula involves a triple summation, the number of terms of which increase with n like n^3, and the terms alternate in sign.

3. S. Tantaratana and J.B. Thomas, "Relative efficiency of the sequential probability ratio test in signal detection," IEEE Transactions on Information Theory, vol.IT-24, no.1, pp.22-31 (1978)

   > "Recently, the distribution for the sum of the outputs of an amplifier-limiter (18) $\cdots$ has been derived [by Marks *et al.*] [10]."

4. Kotz, Samuel, Tomasz Kozubowski, and Krzysztof Podgorski. The Laplace distribution and generalizations: a revisit with applications to communications, exonomics, engineering, and finance. No. 183. Springer Science & Business Media, 2001.

   > "In order to solve the detection problem completely, it remains to find the distribution of the statistic
   > $$t = \sum_{i=1}^{N} g_{opt}(x_1).$$
   > This problem was solved in Marks et al. (1987) and results in the following c.d.f."

5. Soury, Hamza, and Mohamed-Slim Alouini. "Symbol error rate of MPSK over EGK channels perturbed by a dominant additive Laplacian noise." IEEE Transactions on Communications 63, no. 7 (2015): 2511-2523.

   > "On the other hand, the linear filter is no longer optimal in presence of laplacian noise as proved in [25 [Marks et al.]], where in [25, Fig. 5 and Fig. 6] the optimal filter has better performance than the linear filter."

6. Kotz, Samuel, Tomasz Kozubowski, and Krzystof Podgorski. *The Laplace distribution and generalizations: a revisit with applications to communications, economics, engineering, and finance. Springer Science & Business Media*, 2012.

   > "This requires the knowledge of the distribution of the test statistic $\sum_{i=1}^{n} g(X_i)$ under the H_0 hypothesis. This distribution is given in Marks et al. (1978). Below we present this result and its proof."

13.6.7 Single Input Ambiguity Function

R.J. Marks II and M.W. Hall, "Ambiguity function display using a single one-dimensional input," Applied Optics, vol. 18, pp.2539-2540 (1979).

1. Richard Bamler and Josef Hofer-Alfeis, "2D Linear Space-Variant Processing by Coherent Optics: A Sequence Convolution Approach," Optics Communications, Vol. 43, No. 2, pp.97-102, 1982

> "The method of using one transparency (to evaluate the ambiguity function)... has already been developed [15,8,19]."

2. M.J. Bastiaans, "Wigner distribution functions display: a supplement to ambiguity function using a single 1-D input," Applied Optics, vol.19, no.2, pp.192-193 (1980);

> "Recently, Marks and Hall introduced a coherent optical processor for ambiguity function display using a single 1-D input." "Because of the dual nature (of the ambiguity function and Wigner distribution), almost the same practical setup that was used in [1] to display the ambiguity function can be used to display the Wigner distribution function of a real 1-D signal."

13.6.8 Temporal Holography

R.J. Marks II, "Two-dimensional coherent space-variant processing using temporal holography." Applied Optics, vol. 18, pp.3670-3674 (1979).

1. B.E.A. Saleh and Marks O. Freeman, "Optical Transformation," in *Optical Signal Processing*, edited by Joseph L. Horner, Academic Press, Inc. San Diego, CA, 1987,p.317

> "Marks [59] proposed a number of processors based on temporally multiplexing the impulse response terms of Eq.(52). Rather than one impulse response being recorded on one hologram, each impulse response is separately introduced into a shift-invariant processing system, and each input sample is processed sequentially in time. The summation is achieved by using the sequential outputs as object beams to expose a single hologram. Thus the crosstalk is eliminated at the expense of time."

2. W.T. Rhodes, "Space-Variant Optical Systems and Processing," in *Applications of Optical Fourier Transforms*, (Academic Press, 1982), pp.333-369

> "Finally, we mention a scheme based on a time integration synthesis of the desired output distribution [27]. A holographic recording system is used to record a multiple exposure hologram where the nth contributing recording of the distribution is $\cdots$"

13.6.9 Light Speed Extrapolation

R.J. Marks II, "Coherent optical extrapolation of two-dimensional signals: processor theory," Applied Optics, vol. 19, pp. 16701672 (1980)

1. Henry Stark and Yongyi Yang, *Vector Space Projections: A Numerical Approach to Signal and Image Processing, Neural Nets, and Optics,* Wiley-Interscience,(1998), p.281.

> "While many problems in optics can be solved by projections, it is difficult to solve such problems using all-optical methods. A notable exception is Marks' all-optical implementations of the convex projection algorithm for implementing super-resolution."

2. Noel, R.R. Khan and H.S. Dhadwai, "Optical Implementation of a Regularized Gerchberg Iterative Algorithm for Super-Resolution," Optical Engineering, vol. 32, no.11, pp.2866-2871 (1993)

> " $\cdots$ investigation of the optical implementation of the Gerchberg's algorithm was by Marks [28-29] and (his student) Smith [30]."

3. Y. Yamakoshi and T. Sato, "Iterative image restoration from data available in multiple restricted regions," Applied Optics, vol.21, no.24, pp.4473-4479 (1982)

> "Marks [7] showed the convergence properties of the (Gerchberg) iterative method when data are available in rectangular regions and the spatial spectrum is bandlimited."

4. J. Maeda and K. Murata, "Digital restoration of incoherent bandlimited images," Applied Optics, vol.21, no.12, pp.2199-2204 (1982)

   "The iterative (Gerchberg) extrapolation algorithm was generalized in two dimensions and implemented on a coherent processor by Marks [11-12]."

5. M.A. Fiddy and T.J. Hall, "Nonuniqueness of superresolution techniques applied to sampled data," Journal of the Optical Society of America, vol.71, no.11, pp.1406-1407 (1981)

   "If no theoretical model is available, two approaches might be successful in overcoming this nonuniqueness The second might be to avoid sampling and compute the extrapolated function optically. Such a procedure would seem feasible and has been proposed by Marks [11]."

6. M. Ibrahim Sezan, Henry Stark and Shu-Jen Yeh, "Projection method formulations of Hopfield-type associative memory neural networks," Applied Optics, Vol. 29, No. 17, pp.2616-2622, 1990

   "An optical implementation of image extrapolation using a special case of POCS, the Gerchberg algorithm, was achieved by Marks [18]."

13.6.10 Differintegral Interpolation

R.J. Marks II and M.W. Hall, "Differintegral interpolation from a bandlimited signal's samples," IEEE Transactions on Acoustics, Speech and Signal Processing, vol. ASSP-29, pp.872-877 (1981).

1. K.C. McGill and L.J. Dorfman, "High resolution Alignment of Sampled Waveforms," IEEE Transactions on Biomedical Engineering, vol.BME-31, no.6, pp.462-466 (1984)

   "This (frequency term) S has a particular significance: it is the DFT of the N-point (m-1)st order *differentiator kernel* [introduced by Marks and Hall] [14]."

13.6.11 Tomographic Posedness

R.J. Marks II, "Posedness of a bandlimited image extension problem in tomography," Optics Letters, vol. 7, pp.376-377 (1982).

1. S. Darenfed and P.V. Farrell, "Internally iterative improvement of optical tomographic reconstructions," Applied Optics, vol.10,no.5, pp.203-205 (1985)

   "Tomographic reconstruction of path-length integral data is necessary for the reconstruction of asymmetric phase objects using holographic interferometry. For the case of limited viewing angles, the reconstruction is, in general, considered to be an ill-posed problem [1]."

13.6.12 Restoring Lost Samples

R.J. Marks II, "Restoring lost samples from an oversampled bandlimited signal," IEEE Transactions on Acoustics, Speech and Signal Processing, vol. ASSP-31, pp.752-755 (1983)

1. Boche-H. Protzmann-M., "Algorithm for reconstructing lost samples from oversampled signals," AEU-INTERNATIONAL JOURNAL OF ELECTRONICS AND COMMUNICATIONS, Vol. 51, no. 6, NOV 1997, p.304-308

   "A bandlimited signal sampled at a rate higher than the Nyquist rate can be reconstructed from its samples even when a finite number of samples Is lost This paper gives a solution to this problem which partially originates from Marks [1]"

13.6.13 Derivative Interpolation Noise Sensitivity

R.J. Marks II, "Noise sensitivity of bandlimited signal derivative interpolation," IEEE Transactions on Acoustics, Speech and Signal Processing, vol. ASSP-31, pp.1029-1032 (1983)

1. B. Carlsson and M. Sternad, "Optimal Differentiation Based on Stochastic Signal Models," IEEE Transactions on Signal Processing, vol.39, no.2, pp.341-353 (1991)

   > "$\cdots$ lower bounds on the noise level of the (differentiation) filter output have been derived in [10-12]"

13.6.14 Ill-Posed Sampling Theorems

K.F. Cheung and R.J. Marks II, "Ill-posed sampling theorems," IEEE Transactions on Circuits and Systems, vol. CAS-32, pp.829-835 (1985).

1. John L. Brown, Jr. and Sergio D. Cabrera, "On Well-Posedness of the Papoulis Generalized Sampling Expansion," IEEE Transactions on Circuits and Systems, pp.554-556, 1991

   > "Cheung and Marks have shown recently that if least one of the interpolation functions used in the generalized sampling expansion of Papoulis is not square integrable, then the problem is ill-posed in the sense that the variance of the error is unbounded when noisy samples are used. We show here..., essentially a converse of the Cheung-Marks result." "In a recent paper [3], Marks and Cheung have investigated the stability or 'well-posedness' of the input reconstruction when independent, identically distributed zero-mean noise samples are added to each of the original samples. They proved that if at least one of the interpolation functions is not square integrable, then the generalized sampling problem is ill-posed, concluding that "such sampling theorems should be avoided. Here, we consider a converse to the Cheung-Marks result and sufficient conditions for the problem to be well posed."

2. John L. Brown, Jr. and Sergio D. Cabrera, "Multi-Channel Signal Reconstruction Using Noisy Samples," Proceedings of the International Conference on Acoustics, Speech and Signal Processing, pp.1233-1236, 1990

   > "*Cheung-Marks Theorem.* ... A reformulation of the Cheung-Marks result is as follows:
   > **C-M Theorem**: Assume $H_1(\omega)$ exists a.e. on $(-\sigma, -\sigma + c)$; so that the (spectra of the interpolation functions) are defined *a.e.* on $(-\sigma, \sigma)$. Then if any one of the (spectra of the interpolation functions) is not square integrable on $(-\sigma, \sigma)$, the reconstruction problem is ill-posed."

3. Unser, Michael, and Josiane Zerubia. "Generalized sampling: Stability and performance analysis." Signal Processing, IEEE Transactions on 45, no. 12 (1997): 2941-2950

   > "In principle, a consistent signal recovery is possible for almost any set of analysis functions provided that some invertibility condition is met (cf., Sect. II-C). Unfortunately, the method will not always yield a reconstruction algorithm that is stable numerically. This fact had already been pointed out by Marks and Cheung, who identified special instances of derivative sampling where the reconstruction is ill-posed [4], [9]."

4. Seidner, Daniel, and Meir Feder. "Noise amplification of periodic nonuniform sampling." IEEE transactions on signal processing 48, no. 1 (2000): 275-277.

   > "We use the analysis of white additive noise in GSE systems as developed in [5]. In this

analysis, we found that

$$\begin{aligned} A_\epsilon &= \frac{1}{c}\int_{-B}^{-B+c}\sum_{k=1}^{M}\sum_{\ell=1}^{M}\left|T_{k\ell}^{-1}(\omega)\right|^2 d\omega \\ &= \frac{1}{c}\int_{-B}^{-B+c}\operatorname{tr}\left\{\mathbf{T}(\omega)^{-1^T}\mathbf{T}(\omega)^{-1^*}\right\} d\omega \end{aligned}$$

where $\mathbf{T}(\omega)$ is Papoulis' GSE matrix, which is an $M \times M$ matrix whose (k,ℓ)th component is given by

$$T_{k\ell}(\omega) = K_k(\omega + (\ell - 1)c)$$

where $c = 2B/M$. A similar expression has been derived by Cheung and Marks [6]"

5. Pawlak, Miroslaw, and Ewaryst Rafajlowicz. "On restoring band-limited signals." Information Theory, IEEE Transactions on 40, no. 5 (1994): 1490-1503.

   "This result is caused by the presence of the noise in the data. The problem of the reduction of the noise level in the representation (1.1) has been discussed in the literature [15], and it has been recommended to employ the oversampling version of (1.1), i.e.,

$$f(t) = \sum_{k=-\infty}^{\infty} f(kh)\operatorname{sinc}\left(\frac{\pi}{h}(t-kh)\right),$$

6. Sideris, Michael G. "Fourier geoid determination with irregular data."Journal of Geodesy 70, no. 1-2 (1995): 2-12

   "The set of lost samples is then defined as $M = \{m_1, m_2, m_3\}$. For this case, equation (13) can be written (Marks II, 1991) as

$$f_c(x) = \left[\sum_{m\notin M} + \sum_{m\in M}\right] f_c(Qm)g(x-Qm)$$

7. Seidner, Daniel, and Meir Feder. "Vector sampling expansion." Signal Processing, IEEE Transactions on 48, no. 5 (2000): 1401-1416

   "The first issue is well posedness. In GSE, this problem was initially discussed by Cheung and Marks [17], who found a suf- ficient condition for ill-posedness of the system. Under their definition, an ill-posed GSE system produces a reconstruction error with unbounded variance when a bounded variance noise is added to the samples."

   "We now derive, using (72), a test that checks whether a VSE system is ill posed or well posed. This test is similar to the one suggested by Cheung and Marks [17] and Brown and Cabrera [18] for GSE systems."

   "As noted above, a well posed VSE system is such that $E\{|v_i^r(t)|^2\}$ is bounded for every bounded σ_v^2. From (75), we conclude, similarly to [17] and [18], that a necessary condition for the well posedness of a VSE system is that all reconstruction filters have a finite energy."

13.6.15 Derivative Noise Sensitivity

R.J. Marks II, "Noise sensitivity of bandlimited signal derivative interpolation," IEEE Transactions on Acoustics, Speech and Signal Processing, vol. ASSP-31, pp.1029-1032 (1983).

1. Unser, Michael, and Josiane Zerubia. "Generalized sampling: Stability and performance analysis." Signal Processing, IEEE Transactions on 45, no. 12 (1997): 2941-2950

> "In general, the situation become less favorable as the order of the derivative increases. In the case of the second derivative (data not shown here), a strong singularity occurs for, which again is consistent with the report of Marks for the bandlimited case."

13.6.16 Nonintersecting Convex Set POCS

M.H. Goldburg and R.J. Marks II, "Signal synthesis in the presence of an inconsistent set of constraints," IEEE Transactions on Circuits and Systems, vol. CAS-32 pp. 647-663 (1985).

1. Dante C. Youla and V. Velasco, "Extensions of a Result on the Synthesis of Signals in the Presence of Inconsistent Constraints," IEEE Transactions on Circuits and Systems, Vol. CAS-33, No. 4, Pp. 465-468, 1986

   > "In a recent interesting paper [4], Goldburg and Marks have used a method of convex projection described in [2] to derive the following interesting and useful result:..."

2. Amir Dembo, "Signal Reconstruction from Noisy Partial Information of Its Transform," IEEE Transactions on Acoustics, Speech, and Signal Processing, Vol. 37, No. 1, pp.65-72, 1989

   > "The proof...is a special case of the general technique of [Goldburg and Marks]."

3. Hui Peng and Henry Stark, "Signal recovery with similarity constraints," Journal of the Optical Society of America A, Vol 6, No.6, pp.844-851, 1989

   > "What happens when the constraints are inconsistent, i.e. when C_0 is the empty set, was investigated [by Goldburg and Marks]"

4. Khan, Muhammad Aqeel Ahmad, and Ulrich Kohlenbach. "Quantitative image recovery theorems." Nonlinear Analysis: Theory, Methods & Applications 106 (2014): 138-150.

   > "However, the classical image recovery problem lacks any information on how a δ-fixed point of T relates to being in the intersection $C_{0,\epsilon}$, of ϵ-neighborhoods $C_{i,\epsilon}$ of C_i. Moreover, the problem of image recovery is often and seriously dealt with the inconsistent constraints i.e., when the intersection of the sets $C_1, C_2, , C_r$ is empty (see e.g. [Goldburg & Marks] $\cdots$."

5. Mayer MM, Feichtinger HG, Grosser M. POCS-Methoden. Reason. 2002 Sep 12

   > "Im Fall zweier disjunkter Mengen (wie immer wird angenommen, daβ beide Mengen sowohl abgeschlossen als auch konvex sind) gilt der folgende Satz, welcher auf Goldburg und Marks [48] zurucükgeht, aber von Youla und Velasco [112] auf komplexe Hilberträume erweitert wurde."

6. Chen, Zhiwu, and Peter J. Knez. "Measurement of market integration and arbitrage." Review of financial studies, 8, no. 2 (1995): 287-325.

   > "Having established the nonexpansiveness of $T(\cdot)$, we need only to use the results from Browder (1965) and Goldburg and Marks (1985) to show that the repeated applications of the composite mapping $T(\cdot)$ will converge to a fixed point in D_A and a corresponding point in D_B."

   > "The convergence of $T^I(\hat{d})$ to a point in F_T is proven in Goldburg and Marks (1985)."

13.6.17 Sample Dependency at Nyquist Rates

R. J. Marks II, Multidimensional-signal sample dependency at Nyquist densities," J. Opt. Soc. Am. A 3, 268273 (1986).

1. Bones, Philip J., Nawar Alwesh, T. John Connolly, and Nicholas D. Blakeley. "Recovery of limited-extent images aliased because of spectral undersampling." JOSA A 18, no. 9 (2001): 2079-2088.

   > "Marks et al.5,6 studied image sampling below the Nyquist limit. They showed how in two and higher dimensions the gaps between the spectral replicates of a bandlimited image can be exploited to allow certain image samples to be recovered from the rest. While the roles of image and spectrum are reversed in our study, we are exploiting redundancy in an analogous manner."
   >
   > "Marks et al.5,6 showed how overall sampling density, in relation to the size of limited support in the other domain, affected recovery."

13.6.18 Matched Filter Error Correction

K.F. Cheung, L.E. Atlas, J.A. Ritcey, C.A. Green and R.J. Marks II, "A comparison of conventional and composite matched filters with error correction," Applied Optics, vol. 26, pp.4235-4239 (1987).

1. B.V.K. Vijaya Kumar, "Tutorial survey of composite filter designs for optical correlators," Applied Optics, vol.31, #23, pp.4773-4801

   > "The (7-4) Hamming Code maps each four-bit word to a unique seven bit word so that if even one of the bits in the seven bit work is incorrect, we can still determine the correct four-bit message word. Using this concept, we can design seven SDF's to produce the appropriate seven-bit code word for every input. Thus, every input must go through seven filters. Even if one of the filters produces a 1 instead of a zero (or visa versa), this phenomenon would not affect the final decision process. This idea was suggested by Cheung *et al.*"

13.6.19 Detector Relative Efficiencies

M.I. Dadi and R.J. Marks II, "Detector relative efficiencies in the presence of Laplace noise," IEEE Transactions on Aerospace and Electronic Systems, vol. AES-23, pp.568-582 (1987).

1. M.W. Thompson and H.S. Chang, "Coherent Detection in Laplace Noise," IEEE Transactions on Aerospace and Electronic Systems, volume 30, no.2, pp.452-461 (1994)

   > "Additionally, a comparison of the asymptotic performance of the Neyman-Pearson optimal detector and the matched filter detector ... was given in [2] [by Dadi and Marks]."

2. S.A. Kassam, *Signal Detection in Non-Gaussian Noise*, (Springer-Verlag, 1988)

   > "More recently, Dadi and Marks (1987) have studied further the relative performances of the linear, sign, and optimum detectors for double-exponential noise pdf's"

3. Kotz, Samuel, Tomasz Kozubowski, and Krzysztof Podgorski. The Laplace distribution and generalizations: a revisit with applications to communications, exonomics, engineering, and finance. No. 183. Springer Science & Business Media, 2001.

   > "The importance of the explicit formula for the test statistic in the above problem is due to the fact that the asymptotic Gaussian approximation is not usually very accurate for small and moderate sample sizes. For example, it was shown in Dadi and Marks (1987) that for samples size in the range from 5 to 50 the Gaussian approximation can be quite conservative, some yielding the t_α-value substantially larger then its exact value..."

13.6.20 Hopfield: Synchronous Versus Asynchronous

K.F. Cheung, L.E. Atlas and R.J. Marks II, "Synchronous versus asynchronous behavior of Hopfield's content addressable memory," Applied Optics, vol. 26, pp.4808-4813 (1987).

1. Reprinted in Artificial Neural Networks: Concepts & Control Applications, IEEE Computer Society Press, pp. 142-147, 1992.
2. Reprinted in Optical Neural Networks edited by Suganda Jutamulia (The Society of Photo-Optical Instrumentation Engineers, Bellingham, WA), pp. 188-193, 1994.

13.6.21 Convolutional Neural Networks

T. Homma, L.E. Atlas and R.J. Marks II "A neural network model for vowel classification," Proceedings of the International Conference on Acoustics, Speech and Signal Processing, 1987.

1. KVITA, Jakub. "Image Captioning with Recurrent Neural Networks" Masters thesis. Brno University of Technology, Faculty of Information Technology, 2016.

   > "CNN ideas took inspiration from neurobiology, more precisely the organisation of neurons in visual cortex of the cat. They were first used in the work of Homma [1], to process a temporal signal."

2. Kishek, Alfred. "Empirical Evaluation of Deep Convolutional Neural Networks as Feature Extractors." University of Michigan-Dearborn (2017).

   > "CNNs were first developed to recognize spatio temporal patterns in 1988 (Atlas et al., 1987). At this time, the multiplication function for neurons was replaced with convolution. CNNs were later improved in 1998 (Lecun et al., 1998), and generalized and simplified in 2003 (Simard et al., 2003)."

3. James, Conrad D., James B. Aimone, Nadine E. Miner, Craig M. Vineyard, Fredrick H. Rothganger, Kristofor D. Carlson, Samuel A. Mulder et al. "A historical survey of algorithms and hardware architectures for neural-inspired and neuromorphic computing applications." Biologically inspired cognitive architectures 19 (2017): 49-64.

   > "With the development of new algorithms, specialized hardware, and techniques for training neural networks, new types of problems other than static classification of objects became of interest. Dynamic problems such as tracking objects in video feeds and parsing speech have become the dominant focus of much of the research in the field. Atlas et al. (1988) implemented an early application of neural networks in the time domain in order to extract and classify phonemes from speech data. To apply neural networks to such time-varying data, the mathematics of the system were altered to have multiplication steps converted to convolutions and weights converted to transfer functions."

13.6.22 Associative Memories With Nonlinearities in the Correlation Domain

R.J. Marks II, L.E. Atlas, J.J. Choi, S. Oh, K.F. Cheung and D.C. Park, "A performance analysis of associative memories with nonlinearities in the correlation domain," Applied Optics, vol. 27, pp.2900-2904 (1988)

1. G.Lu, M. Lu and F.T.S. Yu, "Multilayer Associative Memory and Its Hybrid Optical Implementation," Applied Optics, vol.34, no.23, pp.5109-5117 (1995)

   > "Marks et.al. [14] and Chiueh and Goodman have shown that exponential nonlinear operations can indeed sufficiently remove the interpattern cross talk; thus the exponential associative memory could possibly retrieve the desired exemplar with only one iteration."

13.6.23 Optical POCS

R.J. Marks II, L.E. Atlas and K.F. Cheung, "Optical processor architectures for alternating projection neural networks," Optics Letters, vol. 13, pp.533-535 (1988)

1. Reprinted in SPIE Milestone Series: Selected Papers in Optical Neural Networks edited by Suganda Jutamulia (The Society of Photo-Optical Instrumentation Engineers, Bellingham, WA, 1994)
2. M. Ibrahim Sezan, Henry Stark and Shu-Jen Yeh, "Projection method formulations of Hopfield-type associative memory neural networks," Applied Optics, Vol. 29, No. 17, pp.2616-2622, 1990

> "To the best of our knowledge, Marks was the first to establish the relationship between a particular ACAM network and POCS [4,19]. He proposed an ACAM network which extrapolated partially specified, continuous valued memory patterns by alternating orthogonal projections onto two constraint sets."

13.6.24 Algebraic Optical Processors Error Correction

S. Oh, D.C. Park, R.J. Marks II and L.E. Atlas "Error detection and correction in multilevel algebraic optical processors," Optical Engineering, vol. 27, #4, pp.289-294 (1988).

1. S.A. Ellet *et al.*, "Error correction coding for accuracy enhancement in optical matrix-vector multipliers," Applied Optics, vol.31, no.26, pp.5642-5653 (1992)

> "However, OMVM's (optical matrix-vector multipliers) can also operate on nonbinary data. Oh *et al.* have proposed a generalization of the binary (7,4) Hamming code that can be used to provide error correction for OMVM's by using nonbinary data [5]." "...decoding can be performed optically also [5]. Optical decoders are preferred for maintaining the high speed and parallelism of optics."

13.6.25 Alternating Projection Neural Networks

R.J. Marks II, S. Oh and L.E. Atlas, "Alternating projection neural networks," IEEE Transactions on Circuits and Systems, vol.36, pp.846-857 (1989)

1. V.V. Vinod, S.Ghose and P.P. Chakrabarti, IEEE Transactions on Systems, Man & Cybernetics, Part B: Cybernetics, vol.26, no.4, Aug 1996, pp. 509-521

> "In this paper we propose a neural network based on the idea of projection onto convex sets (POCS) for solving OPIC. The POCS technique has earlier been used in artificial neural networks for perfect memory recall by Marks *et al.* [1], [20]. They proposed alternating projection neural networks based on repeated sequential projections onto the closure of stored vectors and the partial vector which has to be completed."

2. S. Jankowski, A. Lozowski and J.M. Zurada, "Complex-Valued Multistage Neural Associateive Memory," IEEE Transactions on Neural Networks, vol.7, no.6, pp.1491-1496, (1996)

> "Multivalued pattern storage can also be obtained by using a continuous state classified that performs matching of an input to some "library patterns. As has been shown in in [9] [by Marks *et al.* that] projecting in a signal space between constraint sets corresponding to the patterns can serve as a content addressable multivalued memory with linear capacity."

13.6.26 Cone Shaped Kernels: Zamograms

Y. Zhao, L.E. Atlas and R.J. Marks II, "The use of cone-shaped kernels for generalized time-frequency representations of nonstationary signals," IEEE Transactions on Acoustics, Speech and Signal Processing, vol. 38, pp.1084-1091 (1990).[20]

[20] Referenced as the *Zhao, Atlas and Marks (ZAM) GTFR* and *cone shaped kernel*

1. The cone-shaped distribution' introduced in this paper was first commercially distributed by National Instruments' Joint Time-Frequency Analysis software toolkit in 1995. It is also in the MATLAB toolbox.

2. Zeng, Deze, Xuan Zeng, G. Lu, and B. Tang. "Automatic modulation classification of radar signals using the generalised time-frequency representation of Zhao, Atlas and Marks." IET radar, sonar & navigation 5, no. 4 (2011): 507-516.

   > "We have studied mechanisms of the generalised timefrequency representation of Zhao, Atlas and Marks (ZAMGTFR) [14, 15]. The ZAM-GTFR simultaneously preserves the property of finite time support, strengthens spectral peaks and smoothes cross-terms. It is shown that ZAMGTFR has advantage over most of the other TFRs under conditions of low SNR and some characteristic features are easy to be extracted from the 2-D time-frequency plane, such as the negative peaks with respect to the phase changes of PSK. We analyse the ZAM-GTFRs of five types of radar signals and obtain four characteristic features.
   >
   > The remainder of this paper is organised as follows. Section 2 gives the ZAM-GTFRs of the referred signals. In Section 3, we obtain the characteristic features from the frequency ridges of the ZAM-GTFRs and the negative peaks. In Section 4, we detail the signal recognition flow. Section 5 shows the PSRs and Section 6 provides conclusions."

3. B. Boashash, "Estimation and interpreting the instantaneous frequency of a signal - Part 2: Algorithms and Applications," Proceedings of the IEEE, vol.80, no.4, pp.540-568, 1992

   > "The Zhao-Atlas-Marks Distribution, for example, seems to have good time-frequency localization and good noise performance [72], making it a useful prospect for IF estimation."

4. R.G. Baraniuk and D.L. Jones, "A signal-dependent time-frequency representation: optimal kernel design," IEEE Transactions on Signal Processing, vol. 41, no.4, pp.1603-1617, (1993)

   > "The generating kernel for the cone-kernel distribution is shown in Fig.4(a). The time-frequency representation of the cone-kernel is excellent for pulse-like signals whose AF autocomponents lie near the θ axis ..."

5. Leon Cohen, "Introduction: a primer on time-frequency analysis," in *Time-Frequency Signal Analysis, B. Boashash, Editor*

   > "5.3. Zhao-Atlas-Marks distribution. A new time-frequency distribution with many attractive features has been developed by Zhao, Atlas and Marks [18]. Their distribution significantly enhances the time and frequency resolution and suppresses the cross terms. Furthermore, they have examined the basic conditions which a distribution must satisfy to have good time and frequency resolution. For the ZAM distribution r(t;) as defined by ... There are two dramatic differences between the spectrogram and the ZAM. First note how sharp and discernable the time of transition at the frequency jumps in the ZAM distributions. Secondly note how much sharper the frequency resolution is in the ZAM... The ZAM distribution has been applied to speech with very impressive results."

6. R.N. Czerwinski and D.L. Jones, "An adaptive time-frequency representation using a cone-shaped kernel," Proceedings of the International Conference on Acoustics, Speech and Signal Processing, Minneapolis (April 27-30, 1993), IEEE, pp.IV404-IV407;

   > "The CKD is characterized by a kernel used by Zhao et.al. [3] ... In creating an adaptive CKD, we seek to select the parameter T, which is the cone length."

7. M.G. Amin, "Time-Frequency Distributions in Statistical Signal and Array Processing," IEEE Signal Processing Magazine, (September 1998), pp.32-34

> "Choi and Williams [62] and Zhao, Atlas and Marks [465] have proposed t-f kernels which make identification (of cross-terms introduced from the bilinear nature of TDF's) much more feasible than attainable using the WD. The distributions using these two kernels have come to be known as the Choi-Williams (CW) and the ZAM TFD's. In both distributions, the kernel is characterized by one parameter whose value can be adjusted to achieve a tradeoff between resolution and cross-term suppression."

8. Zeng, D., X. Zeng, G. Lu, and B. Tang. "Automatic modulation classification of radar signals using the generalised time-frequency representation of Zhao, Atlas and Marks." IET radar, sonar & navigation 5, no. 4 (2011): 507-516.

> "We have studied mechanisms of the generalised time- frequency representation of Zhao, Atlas and Marks (ZAM- GTFR) [14, 15]. The ZAM-GTFR simultaneously preserves the property of finite time support, strengthens spectral peaks and smoothes cross-terms. It is shown that ZAM- GTFR has advantage over most of the other TFRs under conditions of low SNR and some characteristic features are easy to be extracted from the 2-D time-frequency plane, such as the negative peaks with respect to the phase changes of PSK."

9. Vaidya, Vinay G., and Robert M. Haralick. "The use of GTFR with cone shaped kernel for motion estimation." In Time-Frequency and Time-Scale Analysis, 1992., Proceedings of the IEEE-SP International Symposium, pp. 535-538. IEEE, 1992.

> "In this paper we have shown a successful application of the GTFR with cone kernel. The results presented clearly show that this new method can detect object location even under extreme noise conditions."

10. Dongmei, Jiang, and Zhao Rongchun. "Speaker normalization based on the generalized time-frequency representation and Mellin transform." In Signal Processing Proceedings, 2000. WCCC-ICSP 2000. 5th International Conference on, vol. 2, pp. 782-785. IEEE, 2000.

> "For vocal tract length normalization in speaker-independent speech recognition, a novel feature extraction method is carried out on the generalized time-frequency representation with cone-shaped kernel (CK-GTFR) and Mellin transform. The GTFR is superior to other representations in suppressing cross terms and producing good time and frequency resolution simultaneously."

11. Tran, Q. T., and P. M. Moore. "Application of the generalized time-frequency representation cone-shaped kernel to structural acoustics data." The Journal of the Acoustical Society of America 90, no. 4 (1991): 2341-2341.

> "Here, the cone-shaped kernel is compared to the spectrogram and Wigner distribution, and shown to provide and improved tool for understanding the backscattering phenomena."

12. Rosser, Daniel Mark. "Time frequency analysis of a noisy carrier signal." PhD diss., Monterey, California. Naval Postgraduate School, 1995.

> "...the signal detection problem is addressed using time frequency processing of a carrier signal embedded in additive white gaussian noise (AWGN). A TFR (time frequency representation) performance measure based on a mean and variance analysis is proposed and used to estimate the center frequency of a carrier. Through computation of the discrete-time TFR, our results show that this measure provides a means to determine the presence of a carrier signal in noise even when the TFR itself becomes quite obscured by the noise.The cone kernel-TFR is seen to yield the highest frequency resolving capability compared with the Wigner-Ville distribution and the Choi-Williams distribution."

13. CHI, Huanzhao, Cai LIU, Xuanlong SHAN, Dian WANG, and Qi LU. "Application of spectral decomposition technology in shallow gas detection based on Wigner-Ville distribution." Global Geology 17, no. 4 (2014): 243-246.

"The cone-shaped kernel function used to reduce the cross-term interference is proposed by Zhao et al. (1990). The expression is

$$\varphi_k(\tau) = \frac{\sin\left(\frac{\tau\nu}{2}\right)}{\frac{\tau\nu}{2}} \exp\left(\frac{-\tau^2}{\alpha}\right)$$

Where τ is time delay, ν is deviation and α is a constant used to control the shape of the kernel function.

"Fig 1 shows that the process of spectral decomposition technology based on the Wigner-Ville. Fig 2 shows that cone-shaped kernel function can suppress the ambiguity of the signals in the time delay axis and outside the coordinate axis."

14. ZENG, Xiaodong, Bin TANG, and Ying XIONG. "Interception Algorithm of S-cubed Signal Model in Stealth Radar Equipment." Chinese Journal of Aeronautics 25, no. 3 (2012): 416-422.

    "First, the generalized time-frequency representation of Zhao, Atlas, and Marks (ZAM-GTFR) and Hough transforms (HT) are applied to detecting the signal, and then the initial frequency and modulation slope of LFM are estimated from the ZAM-GTFR. On the basis of LFM information, the reconstructing signal is generated. Finally, the code rate of discrete phase code is extracted from the negative peaks of the ZAM-GTFR. Simulation results show that the proposed algorithm has higher estimation accuracy when the signal to noise ratio (SNR) is above 3 dB."

15. G.X. Chena and Z.R. Zhou, "Timefrequency analysis of friction-induced vibration under reciprocating sliding conditions," Wear, Volume 262, Issues 12, 4 January 2007, Pages 110

    " ZhaoAtlasMarks distribution produces a good resolution in time and frequency domains. The ZAMD method reduces the interference resulting from the cross-terms present in multi-component signals. It is useful in resolving close spectral peaks and capturing non-stationary and multi-component signals."

16. Lokenath Debnath, *Wavelet transforms and their applications,* Birkhäuser Boston, (2001) p.355

    "[T]he Zhao-Atlas-Marks time-frequency distribution ... significantly enhances the time and frequency resolution and eliminates all undesirable cross terms. // The ZAM distribution has been applied to speech with remarkable results."

17. P. A. Karthick and Shankar Ramakrishnan. "Analysis of surface Electromyography signals using ZAM based quadratic time frequency distribution." 2014 40th Annual Northeast Bioengineering Conference (NEBEC), pp. 1-2. IEEE, 2014.

    In this work, the variation of IMDF and IMNF of sEMG signals are studied during dynamic muscle contraction. sEMG signals are recorded from biceps brachii muscles of 50 healthy volunteers. ZAM based QTFD is used to analysis the signal. IMDF and IMNF are extracted from the time-frequency spectrum of recorded signal. It is found that IMDF and IMNF are higher in non-fatigue conditions. The result shows a negative slope for linear regression fit for all subjects.

18. Rajagopalan, Satish, José Restrepo, José M. Aller, Thomas G. Habetler, and Ronald G. Harley. "Nonstationary motor fault detection using recent quadratic timefrequency representations." IEEE Transactions on Industry Applications, 44, no. 3 (2008): 735-744.

    "While the emphasis on development of distributions such as the CWD was to meet marginal conditions and other properties [10], the development of ZAM cone-kernel' was intended to introduce finite time support and reduce cross-terms [5]. The kernel to be used in (1) to obtain a ZAM distribution is

$$\varphi(\xi,\tau) = \varphi_1(\tau)\frac{\sin\left(\xi|\tau|/a\right)}{\xi/2}$$

where $\varphi_1(\tau)$ is a function to be specified (usual-ly taken to be equal to one) and a is greater than or equalto two. The cone-shaped kernel function suppresses the cross terms away from the vertical axis and the origin of the ambiguity function plane. The BJ distribution is similar to the ZAM distribution.

19. Satish Rajagopalan, José Restrepo, José M. Aller, Thomas G. Habetler, and Ronald G. Harley. "Selecting time-frequency representations for detecting rotor faults in BLDC motors operating under rapidly varying operating conditions." In Industrial Electronics Society, 2005. IECON 2005. 31st Annual Conference of IEEE, pp. 6-pp. IEEE, 2005.

    "The ZAM ... is a newer distribution that significantly enhances the time and frequency resolution while suppressing the cross-terms [12]."

    "The ZAM distribution ... shows good energy concentration (low frequency smear), excellent cross-term suppression and much better frequency resolution than the STFT."

20. M. Alemu, Dinesh Kant Kumar, and Alan Bradley. "Time-frequency analysis of SEMG with special consideration to the interelectrode spacing." Neural Systems and Rehabilitation Engineering, IEEE Transactions on 11, no. 4 (2003): 341-345.

    "Linear JTFR techniques such as STFT do not satisfy time or frequency marginal property. TF techniques such as WVD offer a higher resolution compared to STFT and the drawback of WVD of cross terms is overcome by techniques such as CWD and ZAM."

21. Sean A. Fulop and Sandra F. Disner. "Advanced time-frequency displays applied to forensic speaker identification." In Proceedings of Meetings on Acoustics, vol. 6, no. 1, p. 060008. Acoustical Society of America, 2009.

    "Other time-frequency representations besides the spectrogram have been promoted occasionally. These are generally members of the quadratic distribution family based on the Wigner-Ville distribution, which technically includes the spectrogram, but many other candidates have been found which have better time-frequency uncertainty relations than the spectrogram. One of the best overall performers in this family is the Zhao-Atlas-Marks (ZAM) distribution.

22. Rosero, Javier, Luis Romeral, Juan Ortega, and Esteban Rosero. "Short-circuit detection by means of empirical mode decomposition and WignerVille distribution for PMSM running under dynamic condition." IEEE Transactions on Industrial Electronics, 56, no. 11 (2009): 4534-4547.

    "Another TF distribution for fault detection in motor drives that improves TF resolution while providing cross-term suppression is the ZhaoAtlasMarks (ZAM) distribution [21]. ZAM has been recently proposed [22] for rotor fault detection in BLDC motors under rapid changes in motor operation. The authors of the proposals use an adaptive filter driven by a PLL to filter the fundamental frequency, because the fault frequency components are small and could be masked by it. Also, this filtering reduces the occurrence of cross-terms when using quadratic TF distributions."

    "ZAM distribution achieves a very good tradeoff between suppression of cross-terms and loss in TF resolution. For this reason, ZAM is a very promising technique to monitor fault condition in nonstationary working conditions, even if it has higher computational burden than simple WVD."

23. Antsiperov, Viacheslav. "Analytic spectrum as a tool for time-frequency signal analysis." In Image and Signal Processing and Analysis (ISPA), 2017 10th International Symposium on, pp. 59-64. IEEE, 2017.

    "Coneshape kernel representations (CKR)[10], known also as Zhao–Atlas-Marks type TFRs [11] are free from the Page / Levin distribution defects associated with their asymmetry. This class of distributions has a lot of useful properties, which conditioned their

high popularity for numerous applications. In particular, they satisfy the majority of intuitive requirements for nonstationary signals representations - conservation of support, covariance under time and frequency translations, symmetry, etc."

"In addition to the above listed general properties, that instantaneous ASP representations have as CKRs, here we should mention the important special property inherent from representations of [sic] Zhao-Atlas-Marx [sic] (ZAM) type [11]. It means the ability of ZAM representations to achieve a good timefrequency concentration and good attenuation of interference terms unavoidable in the case of multiple sinusoid al bursts. These characteristics are very useful, for example, in the speech processing."

24. Viacheslav Antsiperov, "Analytic Spectrum as a Tool for TimeFrequency Signal Analysis." In Image and Signal Processing and Analysis (ISPA), 2017 10th International Symposium on, pp. 59-64. IEEE, 2017.

    "Relation of the instantaneous ASP with cone-shape distributions The asymmetry-related disadvantages mentioned above are absent in coneshape kernel representations (CKR)[10], known as ZhaoAtlasMarks representations [11 Zhao et al.]. This class of distributions has a whole number of useful properties, which conditioned their high popularity for a whole number of applications. In particular, they satisfy the majority of intuitive requirements for representation of nonstationary signals - they preserve zeros, are covariant compared to frequency and time bias of the signals, are symmetric, etc."

25. Fulya Akdeniz and Temel Kayikçioğlu. "Detection of ECG arrhythmia using Zhao-Atlas Mark time-frequency distribution." 2018 26th Signal Processing and Communications Applications Conference (SIU). IEEE, 2018.

    "In the study, it was purposed to determine ECG arrhythmias. In this context; the data was obtained from the MIT-BIH Arrhythmia database. A total of 214,714 heartbeats were used in the study in order to study a fairly large database. The Zhao-Atlas Mark method is used as the time-frequency distribution method to extract the feature from the ECG signals. In classification, many classifiers were used and it was seen that the best result was taken at the Weighted K-EYK method from K-Nearest Neighbor (K-EYK) classifier. The performance of the system is given as accuracy, sensitivity, specificity, positive predictive value respectively 94.10 , 93.19 , 95.02 , 94.93 ."

13.6.27 Neural Networks Versus CART

L.E. Atlas, R. Cole, Y. Muthusamy, A. Lippman, G. Connor, D.C. Park, M. El-Sharkawi & R.J. Marks II, "A performance comparison of trained multi-layer perceptrons and classification trees," Proceedings of the IEEE, vol.78, pp.1614-1619 (1990).

1. Reprinted in Neural Networks, Theoretical Foundations and Analysis, C. Lau, editor, IEEE Press (1992).

13.6.28 Load Forecasting

D.C. Park, M.A. El-Sharkawi, R.J. Marks II, L.E. Atlas & M.J. Damborg, "Electric load forecasting using an artificial neural network," IEEE Transactions on Power Engineering, vol.6, pp.442-449 (1991)

1. Reprinted in Artificial Neural Networks, E. Snchez-Sinencio & C. Lau, editors, pp.516-522, IEEE Press (1992).
2. C.N. Lu, H.T. Wu and S. Vemuri, "Neural Network Based Short Term Load Forecasting," IEEE Transactions on Power Systems, vol. 8, no.1, pp.336-342 (1993)

    "Park et.al. [11] proposed a neural network with three layers and a delta rule for training the network. The network provided accurate forecasts for hourly, peak and daily total

loads. Tests were conducted over one winter season and the average errors were lower than 2 for all forecasts."

3. Azzam-ul-Asar and J.R. McDonald, "A Specification of Neural Network in the Load Forecasting Problem," IEEE Transactions on Control Systems Technology, vol.2, no.2, June 1994, pp.135-141

> "Park *et al.* [10] investigated the ANN methodology for STLF using three main forecasting targets, namely peak load, daily load and hourly load. The ANN was used to learn the relationship between past, current and future temperatures and loads. The focus was on normal weekday prediction."

13.6.29 Neural Smithing

Russell D. Reed and Robert J. Marks. *Neural smithing: supervised learning in feedforward artificial neural networks.* Mit Press, 1998.

1. Cerrada, Mariela, René Vinicio Sáchez, Diego Cabrera, Grover Zurita, and Chuan Li. "Multi-Stage Feature Selection by Using Genetic Algorithms for Fault Diagnosis in Gearboxes Based on Vibration Signal." Sensors 15, no. 9 (2015): 23903-23926.

> Given the dataset with m samples (x_i, y_i), the algorithm for training an NN for classification purposes is widely known, and it is summarized [by Reed and Marks] as follows, [34]:
>
> (1) Randomly initialize the weights of each layer $W^l, l = 1, ...L$, where w_{ji} is the weight from the neuron $n^{(l1)i}$ to the neuron n_{lj}.
>
> (2) Compute the feedforward propagation to obtain $h_W(x^i)_k$.
>
> (3) Compute the cost function $J(W)$.
>
> (4) Run the backpropagation algorithm to compute $\frac{\partial}{\partial w^l_{ji}} J(W)$.
>
> (5) Use the gradient descent method for adjusting the weights wlij according to the equation $w^l_{ij} := w^l_{ij} - \alpha \frac{\partial}{\partial w^l_{ji}} J(W)$.

13.6.30 APNN's

R.J. Marks II, S. Oh, L.E. Atlas and J.A. Ritcey, "Homogeneous and layered alternating projection neural networks," in Real-Time Signal Processing for Industrial Applications, edited by Bahram Javidi (SPIE Optical Engineering Press, Bellingham, WA. 1989), pp. 217-232.

1. Shu-jeh Yeh and Henry Stark, "Learning in neural nets using projection methods," Optical Computing and Processing, Vol. 1, No. 1, pp.47-59, 1991

> "To the best of our knowledge the first to use projection methods in neural networks was Marks and his coworkers. For example, he used projection methods in designing a net to solve the signal extrapolation problem [14] and used such methods in designing more elaborate Hopfield-type nets and nets involving a hidden layer [15]."

2. Branko Soucek, *Neural and Concurrent Real-Time Systems: The Sixth Generation*, (John Wiley & Sons, 1989)

> Marks *et al.*17,18 suggested a new class of neural networks called alternating projection neural networks (APNN). APNN's perform by alternately projecting between two or more constraint sets, see Fig 3.8. The single point intersection between convex sets is a derived steady-state solution."

13.6.31 Kernel Synthesis

S.Oh, R.J. Marks II, L.E. Atlas and J.W. Pitton, "Kernel synthesis for generalized time-frequency distributions using the method of projection onto convex sets," SPIE Proceedings 1348, Advanced Signal Processing Algorithms, Architectures, and Implementation, F.T. Luk, Editor, pp.197-207, San Diego, July 10-12, 1990.50

1. Leon Cohen, "Introduction: a primer on time-frequency analysis," in *Time-Frequency Signal Analysis*, B. Boashash, Editor

   > "A very important contribution to this problem has recently been made by Oh, Marks, Atlas and Pitton [20]. They observed that functions satisfying a particular constraint form a convex set... Perhaps most significantly the development of Oh *et al.* will help clarify the fundamental issue of whether there is one 'absolute best' distribution to be used as is for all applications or whether different distributions should be used for different circumstances. The perspective of Oh et.al. clarifies this issue considerably because we can now ask what is the best distribution for a given set of constraints ... a very often stated argument why we should always use only one distribution is that there is no procedure for finding a context independent distribution; the work of Oh et.al. does precisely that."

2. Leon Cohen, *Time-Frequency Analysis*, Prentice Hall (1995), p.166;

   > "11.4. Projection Onto Convex Sets. Finding a kernel with all the properties we have enumerated may not be straightforward The method called "projection onto convex sets" automatically picks out the functions, if they exist, that satisfy all of the conditions. Furthermore, if such a function does not exist then the method picks out the best function in the mean square sense. This method was devised by Oh, Marks II, Atlas and Pitton [408]."

13.6.32 Shorted Winding Detection

S. Guttormsson, R.J. Marks II, M.A. El-Sharkawi and I. Kerszenbaum, "Elliptical novelty grouping for on-line short-turn detection of excited running rotors," IEEE Transactions on Energy Conversion, IEEE Transactions on Volume: 14 1 , March 1999 , pp. 1622

1. M.E. El-Hawary, *Fuzzy System Theory in Electrical Power Engineering,* (IEEE Press, 1998), p.xxiv

   > "[Their diagnostic test performs] detection and localization of shorted turns in the DC field winding of turbine-generator rotors using novelty detection and fuzzified neural networks. Use of neural networks with fuzzy logic outputs and traveling wave techniques ... is an accurate locator of shorted turns in turbo-generator rotors"

13.6.33 Sub-Nyquist Sampling

K.F. Cheung and R.J. Marks II, "Image sampling below the Nyquist density without aliasing," Journal of the Optical Society of America A, vol.7, pp. 92105 (1990)

1. Cormac Herley and Ping Wah Wong, "Minimum Rate Sampling and Reconstruction of Signals with Arbitrary Frequency Support," IEEE Transactions on Information Theory, Vol 45, No. 5, July 1999, pp. 15551564.

   > "[Their] very interesting multidimensional construction ... exploit[s] the [required] spectral gaps that occur when sampling multidimensional signals. Their approach is to slice the spectrum into narrow bands, and handle separately those bands which contain signal energy and those which do not."

2. T.R. Gardos and R.M. Mersereau, "FIR filtering of images on a lattice with periodically deleted samples," Proceedings of the International Conference on Acoustics, Speech and Signal Processing, Toronto, 1991

   "Cheung and Marks [1] have shown that for circularly band-limited images, the Nyquist density is not the minimum density which allows perfect reconstruction. In [1] is given an elegant proof indicating this sub-optimality based on the fact that there are still band gaps when circular spectrums are maximally packed. Cheung and Marks then presented a method for deleting samples and subsequently reconstructing them." "In this section, we present a theorem that permits us to periodically delete samples from an image with no loss of information and the procedure by which we reconstruct the deleted samples [1]. First, $\cdots$ " "We now state the PSD (periodic sample deletion) theorem based on [1]. Theorem 4: Let $x_c(t)$ be a bandlimited continuous signal and $s(t)$ be $x_c(t)$ sampled on an arbitrary sampling lattice where there is no spectral overlap. If the Fourier transform of $s(t)$ is such that there are band gaps in the spectrum, then there exists at least one of the signal cosets may be deleted and reconstructed from the remaining units."

3. Berman, Lihu, and Arie Feuer. "Robust patterns in recurrent sampling of multiband signals." Signal Processing, IEEE Transactions on 56, no. 6 (2008): 2326-2333.

   "Utilizing the generalized sampling formulation, it was shown in [3] that recurrent nonuniform sampling can be used to lower the sampling density required for perfect reconstruction of 2-D bandlimited signals below the Nyquist rate. Whereas the Nyquist rate corresponds to the highest frequencies in the signal spectral support, the aforementioned sub-Nyquist rate can asymptotically achieve the Landau rate [4] [also known as the minimum-rate sampling (MRS)] corresponding to the Lebesgue measure of the signal spectral support."

4. Prelee, Matthew A., and David L. Neuhoff. "Multidimensional Manhattan Sampling and Reconstruction." IEEE Transactions on Information Theory 62, no. 5 (2016): 2772-2787.

   "One substantial line of past work applies to sampling sets that consist of a sublattice of some specified base lattice, together with some of its cosets, each of which is a shift of the sublattice by some base lattice point. In this case, the subsampling corresponding to each coset (including the sublattice itself) can be viewed as a channel in a Papoulis multichannel, generalized sampling scheme. Consequently, the method of [28] can be applied. This is the approach taken by Marks and Cheung [17][19]. Since a Manhattan set can be viewed as the union of what we earlier called the coarse (rectangular) lattice and some number of its cosets with respect to the *dense (rectangular) lattice*, which contains all points t such that for each i, its ith coordinate is an integer multiple of λ_i, the Papoulis-Marks-Cheung (PMC) approach can be applied to Manhattan sets.

   "In particular, Marks and Cheung focused on images with a given spectral support region and an initial base sampling lattice such that the induced spectral replicas of this support region do not overlap. They then showed that cosets of some sublattice could be removed from the base lattice until the sampling density was minimal (in the Landau sense) or approached minimal. Their method involved (a) partitioning the Nyquist region of the initial base lattice into atoms the size and shape of the Nyquist region of the sublattice, (b) counting the number of atoms of this partition that are not overlapped by any spectral replica of the designated support region induced by the initial base sampling lattice, and (c) showing that this number of sublattice cosets can be removed from the initial base lattice due to their samples being linearly dependent on other samples. If the atoms of the partition are too coarse to closely match the set of frequencies not contained in any spectral support replica, then choosing a sparser sublattice will enable a finer partitioning, resulting in a higher fraction of the base samples being removed, which allows the sampling rate to be reduced until it equals or approaches the Landau minimum.

   "With hindsight, one can apply their approach to a Manhattan sampling set."

13.6.34 Shannon Sampling Book

R.J. Marks II, Introduction to Shannon Sampling and Interpolation Theory, (Springer-Verlag, 1991, ISBN 0-387-7391-5 and 3-540-97391-5).

1. Listed as suggested reading' in IEEE Signal Processing Magazine, special issue on education, October 1992, p. 50.

2. Seidner, Daniel, and Meir Feder. "Noise amplification of periodic nonuniform sampling." IEEE transactions on signal processing 48, no. 1 (2000): 275-277.

   "We define the noise amplification factor A_ϵ as

   $$A_\epsilon \frac{\overline{E\{|v^r(t)|^2\}}}{\sigma_v^2}$$

   where $\overline{E\{|v^r(t)|^2\}}$ is the time average of $E\{|v^r(t)|^2\}$ and A_ϵ is equal to Marks' normalized interpolation noise variance (NINV) [2]"

3. Seidner, Daniel, and Meir Feder. "Vector sampling expansion." Signal Processing, IEEE Transactions on 48, no. 5 (2000): 1401-1416

   The VSE Interpolation Formula. In this section, we provide the explicit interpolation formula for the case where is an integer, and reconstruction is possible. This derivation resembles the technique used in [4] and [6]."

4. Bissantz, Nicolai, Hajo Holzmann, and Axel Munk. "Testing parametric assumptions on band-or time-limited signals under noise." Information Theory, IEEE Transactions on 51, no. 11 (2005): 3796-3805.

   "In this situation, we can use the estimator (4) with $\tau = 1/n$. Notice that except for the normalization, this estimator corresponds to a kernel regression estimator with kernel $K(x) = \sin(x)/(\pi x)$ and inverse bandwidth Ω. This kernel is sometimes referred to as the sinc-kernel. Note that, in contrast to the setting in Sec- tion III, the signal cannot be band-limited, except if $f = 0$ (see [24], [38])."

13.6.35 Radiotherapy

P.S. Cho and R.J. Marks II, "Hardware-sensitive optimization for intensity modulated radiotherapy," Phys. Med. Biol, 2000 (pp. 429-440)

1. Inokuchi, Haruo, Takashi Mizowaki, Yoshiki Norihisa, Kenji Takayama, Itaru Ikeda, Kiyonao Nakamura, Mitsuhiro Nakamura, and Masahiro Hiraoka. "Clinical effect of multileaf collimator width on the incidence of late rectal bleeding after high-dose intensity-modulated radiotherapy for localized prostate carcinoma." International journal of clinical oncology (2015): 1-6.

   "The multileaf collimator (MLC) is an important component of IMRT delivery, because it facilitates delivery of irregularly shaped or intensity-modulated treatment fields. The development of treatment-planning software coupled with integration of MLC, a type of mechanized radiation beam-shaping device, has enabled the introduction of a more conformal intensity distribution [5, 6]."

13.6.36 ZAM Distribution Properties

S. Oh and R.J. Marks II, "Some properties of the generalized time frequency representation with cone shaped kernels," IEEE Transactions on Signal Processing, vol.40, No.7, pp.1735-1745, 1992.

1. Deze Zeng, Xuan Zeng, G. Lu, and B. Tang. "Automatic modulation classification of radar signals using the generalised time-frequency representation of Zhao, Atlas and Marks." IET Radar, Sonar & Navigation 5, no. 4 (2011): 507-516.

   "We have studied mechanisms of the generalised timefrequency representation of Zhao, Atlas and Marks (ZAMGTFR) [14, 15]. The ZAM-GTFR simultaneously preserves the property of finite time support, strengthens spectral peaks and smoothes cross-terms. It is shown that ZAM-GTFR has advantage over most of the other TFRs under conditions of low SNR and some characteristic features are easy to be extracted from the 2-D time-frequency plane, such as the negative peaks with respect to the phase changes of PSK."

2. James R. Bulgrin, Bernard J. Rubal, Theodore E. Posch, and Joe M. Moody. "Comparison of binomial, ZAM and minimum cross-entropy time-frequency distributions of intracardiac heart sounds." Conference Record of the Twenty-Eighth Asilomar Conference on Signals, Systems and Computers, 1994. vol. 1, pp. 383-387. IEEE, 1994.

   "The ZAM-TFD has been shown to be effective in tracking frequency-hopping signals and representing signals in the presence of white noise [14]."

3. Christos Skeberis, Zaharias D. Zaharis, Thomas D. Xenos, and Dimitrios Stratakis. "ZAM distribution analysis of radiowave ionospheric propagation interference measurements." International Conference on Telecommunications and Multimedia (TEMU), 2014 , pp. 155-161. IEEE, 2014.

   "The cone-shaped kernel ... provides cross-term suppression and higher resolution in the derived spectrum. Compared to the standard signal processing methods, such as the Fourier transform or the fast Fourier transform, as well as more contemporary ones, such as the wavelet analysis and the Hilbert-Huang Transform (HHT), ZAMD exhibits significant advantages. First, it is highly applicable to nonlinear and non-stationary signal processing producing spectra with an emhpasis on frequency resolution. Although it lacks the filtering capabilities of HHT it provides strong cross-term suppression."

   "By processing the signals with the ZAMD method and producing the relevant spectra, an accentuation of the disturbances can be provided and attributed to seismic precursor phenomena."

4. A. Trochidis, L. Hadjileontiadis, and K. Zacharias. "Analysis of Vibroacoustic Modulations for Crack Detection: A Time-Frequency Approach Based on Zhao-Atlas-Marks Distribution." Shock and Vibration 2014 (2014).

   "...the following expression can be obtained that defines the ZAM distribution:

$$\mathrm{ZAM}_X(t,f) = \int_{-\infty}^{\infty} \left[h(\tau) \int_{t-|\tau|/2}^{t+|\tau|/2} X\left(s+\frac{t}{2}\right) \times X^*\left(s-\frac{t}{2}\right)\right] \times e^{-j2\pi f\tau} d\tau.$$

   ZAM distributionwas selected among RIDs due to its advantage of significantly reducing cross-terms between signal components, through its cone-shaped kernel function (4)."

5. Hadjidimitriou, Stelios, and Leontios Hadjileontiadis. "EEG-based discrimination of music appraisal judgments using ZAM time-frequency distribution." Proceedings of the 12th International Conference on Music Perception and Cognition and the 8th Triennial Conference of the European Society for the Cognitive Sciences of Music, July 23-28, 2012, Thessaloniki, Greece. Cambouropoulos E, Tsougms C, Mavromatis P,Pastiadis K. (Editors)

> Subsequent feature extraction was based on the Zhao-Atlas-Marks (ZAM) time-frequency distribution (TFD). The latter distribution belongs to the quadratic TF representations and adopts a cone-shaped kernel function in order to significantly reduce interferences between signal components (Zhao, Atlas, & Marks, 1990)."

6. Z Xiaodong, T Bin, Y XIONG "Interception Algorithm of S-cubed Signal Model in Stealth Radar Equipment." Chinese Journal of Aeronautics 25, no. 3 (2012): 416-422.

   > "In this paper, a novel detection and parameter estimation approach for the reconnaissance S-cubed radar signal is presented. First, the generalized time-frequency representation of Zhao, Atlas, and Marks (ZAM-GTFR) and Hough transforms (HT) are applied to detecting the signal, and then the initial frequency and modulation slope of LFM are estimated from the ZAM-GTFR. On the basis of LFM information, the reconstructing signal is generated. Finally, the code rate of discrete phase code is extracted from the negative peaks of the ZAM-GTFR. Simulation results show that the proposed algorithm has higher estimation accuracy when the signal to noise ratio (SNR) is above 3 dB."

7. Martinez-de-Juan, J. L., F. J. Saiz, J. L. Ponce, and M. Meseguer. "Retrieval of the small intestinal pressure from time-frequency analysis of the electroenterogram." Proceedings of the 20th Annual Engineering in Medicine and Biology Society, 1998. vol. 3, pp. 1505-1508. IEEE, 1998.

   > "The reduced interference distributions (RID) are obtained for removing cross-terms [9,10]. A large number of distributions are in the RID, but at the present study only CWD and ZAM have been calculated (see figure 2, traces (b) y (c)). Both are suitable for displaying and explaining the electroenterogram in time and in frequency. For example, slow wave is below 2 Hz, clarifying controversy on it [4,5,8]."

8. Climente-Alarcon, Vicente, José A. Antonino-Daviu, Francisco Vedreno-Santos, and Rubén Puche-Panadero. "Vibration transient detection of broken rotor bars by PSH sidebands." Industry Applications, IEEE Transactions on 49, no. 6 (2013): 2576-2582.

   > "The ZhaoAtlasMarks distribution (ZAM) is proposed as the TFD tool. The reason is that it shows an adequate reduction of interferences called cross-terms between parallel evolving harmonics."

9. Stelios K. Hadjidimitriou and Leontios J. Hadjileontiadis. "Toward an EEG-based recognition of music liking using time-frequency analysis." IEEE Transactions on Biomedical Engineering,59, no. 12 (2012): 3498-3510.

   > "ZAM distribution was selected among RIDs due to its advantage of significantly reducing cross terms between signal components, through its cone-shaped kernel function."

13.6.37 Fuzzy control of backpropagation

P. Arabshahi, J.J. Choi, R.J. Marks II and T.P. Caudell, "Fuzzy control of backpropagation," Proceedings of the First IEEE International Conference on Fuzzy Systems (FUZZ-IEEE '92), San Diego, pp. 967-972, March 1992.

1. Dragojlovic, Zoran, Deborah A. Kaminski, and Juntaek Ryoo. "Tuning of a fuzzy rule set for controlling convergence of a CFD solver in turbulent flow." International journal of heat and mass transfer 44, no. 20 (2001): 3811-3822.

   > "Algorithms for controlling algorithms have been recently introduced as a new discipline in soft computing [8] and [9].

2. Pham, D. T., and A. A. Fahmy. "Neuro-fuzzy modelling and control of robot manipulators for trajectory tracking." In 16th IFAC WORLD CONGRESS, pp. 4-8. 2005.

> "In (Arabshahi et al., 1992), fuzzy control of the learning rate *eta* is suggested. The idea behind fuzzy control of the learning rate is the implementation of the heuristics used for faster convergence in terms of fuzzy IF-THEN rules."

3. Fahmy, Ashraf Ahmed, and AM Abdel Ghany. "Adaptive functional-based neuro-fuzzy PID incremental controller structure." Neural Computing and Applications (2015): 1-16.

> "In [Arabshahi et. al., 1992], fuzzy control of the learning rate η is suggested. The central idea behind fuzzy control of the BP algorithm is the implementation of the heuristics used for faster convergence in terms of fuzzy 'If-Then' rules. In this study, the fuzzy PID-like feed-back controller along with a fixed learning rate provides the general non-linear policy of the controller and learning signal as well. It can be seen that the proposed neuro-fuzzy PID controller is designed in a way that makes the controller tuning achievable using any algorithm due to the contentious differentiable membership functions selected and the differentiable fuzzification and defuzzification methods applied in the network."

13.6.38 r-shrink Wireless Communication

A.K. Das, R.J. Marks II, M.A. El-Sharkawi, Payman Arabshahi and Andrew Gray, "r -shrink: A Heuristic for Improving Minimum Power Broadcast Trees in Wireless Networks," IEEE Global Telecommunications Conference 2003. GLOBECOM '03. ,Volume: 1, 1-5 Dec. 2003, pp.523 - 527.

1. Bhukya, Wilson Naik, and Alok Singh. "An effective heuristic for construction of all-to-all minimum power broadcast trees in wireless networks." In Advances in Computing, Communications and Informatics (ICACCI, 2014 International Conference on, pp. 74-79. IEEE, 2014.

> "Das et al. [4] have proposed the r-shrink procedure, which is a simple heuristic that performs local search to improve the broadcast trees in wireless networks."

13.6.39 Fuzzy Fusion & Annihilation

B.G. Song, R.J. Marks II, S. Oh, P. Arabshahi, T.P. Caudell and J.J. Choi, "Adaptive membership function fusion and annihilation in fuzzy if-then rules," Proceedings of the Second IEEE International Conference on Fuzzy Systems (FUZZ-IEEE '93), San Francisco, March 1993, vol II. pp.961-967.

1. DERUGO, Piotr, Jarosław KACERKA, Marcin JASTRZĘBSKI, and Krzysztof SZABAT. "Sterowanie silnikiem liniowym z wykorzystaniem adaptacyjnej struktury sterowania z regulatorem rozmytym typu PID." PRZEGLĄD ELEKTROTECHNICZNY, ISSN 0033-2097, R. 91 NR July 2015, pp.93-96

> "Jedną z możliwości ograniczania kosztów implementacji jest zmniejszenie bazy reguł przez zastosowanie różnych metod redukcji jej rozmiaru [11], [12]. Klasycznie przeprowadza się to przez łczenie poszczególnych obszarów. Prowadzi to jednakże do pogorszenia jakości regulacji. Innym rozwizaniem, rozpatrywanym w niniejszej pracy, jest zastosowanie warstwy tranzycji Petriego. Jej implementacja powoduje znaczce obniżenie liczby operacji matematycznych koniecznych do wyznaczenia wartości wyjściowej, a tym samym skutkuje skróceniem czasu wykonania si pojedynczej iteracji algorytmu (nawet o 30) szczególnie dla przypadków regulatora rozmytego o dużej liczbie reguł."

13.6.40 Intelligence: Computational Versus Artificial

R.J. Marks, II, "Intelligence: Computational Versus Artificial." IEEE Transactions on Neural Networks 4: 737-739 (1993).

1. Cinar, Ali. "Control of nonlinear and hybrid process systems, Panagiotis D. Christofides and Nael H. El-Farra, Springer, New York, NY, 2005." International Journal of Robust and Nonlinear Control 17, no. 4 (2007): 349-351.

> "However, the most decisive step in formulating the term Computational Intelligence was made during the 1994 IEEE World Congress on Computational Intelligence (WCCI) [2]. At that time, R. J. Marks, in his Editorial Note to the IEEE Transactions on Neural Networks [3], pointed out that, although seeking similar goals, computational intelligence has emerged as a sovereign field distinct from artificial intelligence. Since that time the WCCI has become a regular event."

2. Slany, Wolfgang. "Fuzzy scheduling. Christian Doppler Laboratory for Expert Systems," Dissertation, 1994.

> "In both cases, artificial intelligence as well as fuzzy logic, one tries in some sense to imitate life in its problem-solving capability. The ways how to achieve this goal are different in many respects, but there are also many common points where the two fields overlap: Robert Marks [268] counted 4811 entries on fuzzy logic in the INSPEC data base from 1989 to 1993, containing citations from over 4000 selected journals, books, conference proceedings and technical reports - "22 of them [were] cross categorized in the expert system category, and 12 with neural networks." Based on various 'bean countings', Marks concludes that the overlapping areas cover, depending on the way to count, from 14 to 33 ."

3. *Introduction to Computational Intelligence.* John Wiley, (2013).

> " Marks (1993) clearly outlined the distinction between CI and AI, although both CI and AI seek similar goals."

4. A. Joshi, N. Ramakrishman, E.N. Houstis, J.R. Rice, " On Neurobiological, Neuro-Fuzzy, Machine Learning and Statistical Pattern Recognition Techniques," Neural Networks, IEEE Transactions on, v.8 , #1, 1997, pp.18 - 31

> "WE begin this paper, to paraphrase the popular song, at the very beginning in consideration of the interdisciplinary audience that is the target of this issue. Neural N etvvorks (NN) represent a computational [1] approach to intelligence, as contrasted with the traditional, more symbolic approaches."

5. Zadeh, L. A., D. Tufis, F. G. Filip, and I. Dzitac. "Soft Computing for Intelligent Systems." in *From Natural Language to Soft Computing: New Paradigms in Artificial Intelligence.* Lotfi Zadeh, *et al.*, Editors, Editing House of Romanian Academy (May, 2008)

> "In [14], one of the pioneering publications on computational intelligence, Marks defined CI by listing the building blocks being neural nets, genetic algorithms, fuzzy systems, evolutionary programming, and artificial life. Note that in more recent terminology genetic algorithms and evolutionary programming are called by the common name evolutionary computing."

6. Adham Atyabi and Samia Nefti-Meziani. "Applications of computational intelligence to robotics and autonomous systems." In HANDBOOK ON COMPUTATIONAL INTELLIGENCE: Volume 2: Evolutionary Computation, Hybrid Systems, and Applications, pp. 821-863. 2016.

> "There are several opinions regarding to the relationship between CI and AI and in here three of these opinions raised by some of the pioneers in the field are presented in order to better reflect the existing viewpoints. Marks considered CI as an alternative to AI: 'Although seeking similar goals, CI has emerged as a sovereign field whose research community is virtually distinct from AI'."

7. Bezdek, James C. "(Computational) Intelligence: What's in a Name?." IEEE Systems, Man, and Cybernetics Magazine 2, no. 2 (2016): 4-14.

> "Here is the e-mail that I sent to Roy Nutter, Russ Eberhart, Pat Simpson, Bob Marks, and Toshio Fukuda on 9 April 1992 that broached the term CI with the IEEE Neural Networks Council for the first time: Thu Apr 9 12: 33: 11 1992
> To: rsn@ece.wvu.wvnet.edu, rce@rti.rti.org, xm8@sdcc12. UCSD.EDU, d43131a@nucc. nagoya-u.ac.jp, marks@b lake.u.washington.edu,
> From: jbezdek@trivia. coginst.uwf.edu
> Subject: NEW name of council
> Status: R
> I suggest the COMPUTATIONAL INTELLIGENCE COUNCIL, later to become the COMPUTATIONAL INTELLIGENCE SOCIETY"

13.6.41 Fuzzy Control of Genetic Algorithms

R.J. Streifel, R.J. Marks II, R. Reed. J.J. Choi and M. Healy "Dynamic Fuzzy Control of Genetic Algorithm Parameter Coding," IEEE Transactions on Systems, Man and Cybernetics, Part B: Cybernetics (Vol. 29, No. 3, June 1999, pp.426-32).

1. Yao, L. and Huang, J.K., 2018. On-Line Learning of Write Strategy for Ultra-Speed CD-RW Optical Recorder. Sensors, 18(7), p.2070.

> "This convergence difficulty at the final stage of GA-based learning process also exists in other applications. A scheme called dynamic parameter (DPE) extension was proposed in [22] that adaptively controls the mapping from fixed-length binary genes to real values. DPE can further improve GAs convergence by tracking the convergence of a population and using it to direct subsequent searches."

13.6.42 Integer Programming

A.K. Das, R.J. Marks II, M.A. El-Sharkawi, Payman Arabshahi and Andrew Gray, "Minimum Power Broadcast Trees for Wireless Networks: Integer Programming Formulations," Proceedings of IEEE INFOCOM (The Conference of Computer Communications), March 30- April 3, 2003 , San Francisco , CA .

1. Yakine, Fadoua, and Abdellah Idrissi. "Energy-aware topology control and QoS routing in ad-hoc networks." Procedia Computer Science 56 (2015): 309-316.

> "Our paper provides a technique for Topology Control based on an optimization formulation, where the objective is to minimize the overall energy consumed by all the nodes in the wireless ad hoc network with the respect of quality of service requirements. Inspired by the formulations related to the minimum power broadcast trees for Wireless Networks [by Das et al.][4], we adapt them to provide QoS connected topologies."

2. Herrera, F., & Lozano, M. (2009). Fuzzy evolutionary algorithms and genetic fuzzy systems: A positive collaboration between evolutionary algorithms and fuzzy systems. In Computational Intelligence (pp. 83-130). Springer, Berlin, Heidelberg.

> Finally, in [174], an algorithm for adaptively controlling GA parameter coding using fuzzy rules is presented, which was called fuzzy GAP. This uses an intermediate mapping between the genetic strings and the search space parameters. In particular, each search parameter is specified by the following equation:
>
> $$p_s = \left(\frac{p_g}{2^l - 1}\right) \cdot R + O,$$
>
> where p_s is the search parameter, p_g is the genetic parameter, l is the number of bits in the genetic parameter, R is a specified parameter range, and O is a specified offset. By controlling the offset and range, more accurate solutions are obtained using the same number of binary bits.

> "Fuzzy GAP performs a standard genetic search until the population of strings has converged. Convergence was measured by evaluating the average number of bits which differ between all the genetic strings. Each string is compared to every other string and the number of different bits is counted. If the average number of differing bits per string pair is less than a threshold, the GA has converged. After the genetic strings have converged, a new range and offset for the search parameters are determined by means of an FLC with an input that measures the distance between the centre of the current range and the best solution found in the search. After applying the FLC, the GA is executed again with the new values for the range and offset. The performance of fuzzy GAP on a hydraulic brake emulator parameter identification problem was investigated. It was shown to be more reliable than other dynamic coding algorithms (such as the dynamic parameter encoding algorithm), providing more accurate solutions in fewer generations."

13.6.43 Vulnerability Indices

Mingoo Kim, M. El-Sharkawi, M., R.J. Marks II, "Vulnerability Indices of Power Systems, Intelligent Systems Application to Power Systems," 2005. Proceedings of the 13th International Conference on Nov. 6-10, 2005, pp. 335 - 341.

1. Haidar, Ahmed, Azah Mohamed, Majid Al-Dabbagh, and Aini Hussain. 11Vulnerability assessment and control of large scale interconnected power systems using neural networks and neuro-fuzzy techniques." In Power Engineering Conference, 2008. AUPEC'08. Australasian Universities, pp. 1-6. IEEE, 2008.

   > "The growth of power systems and the increase in their complexity requires careful assessment of their vulnerability under different conditions. The purpose of vulnerability assessment is to determine the ability of a power system to continue providing service under any unforeseen catastrophic contingency such as equipment failures, natural calamity, failures in protection operation, faults, human errors, heavy loading conditions and intrusion by external agents [1]."

2. Haidar, Ahmed MA, Azah Mohamed, Aini Hussain, and Norazila Jaalam. "Artificial Intelligence application to Malaysian electrical powersystem." Expert Systems with Applications 37, no. 7 (2010): 5023-5031.

   > "Security of electricity supply networks has always been a key point in the development of the power industry. Several cascading failures and large area blackouts occurring in the USA, some European and Asian countries highlighted the need for vulnerability assessment of power systems. Nowadays, power systems have evolved through continuing growth in interconnection, use of new technologies and controls. Due to the increased operations which may cause power system to be in highly stressed conditions, the need for vulnerability assessment of power systems is important so as to determine its ability to continue proving service in case of any unforeseen catastrophic contingency such as power system component failures, communication system failures, human operator error and natural calamity (Kim, El-Sharkawi, & Marks, 2005)."

3. Haidar, Ahmed, Zulkeflee Khalidin, and Ibrahim Abdulrab Ahmed. "Probabilistic neural network for vulnerability prediction on a practical power system." In Electronics and Information Engineering (ICEIE), 2010 International Conference On, vol. 1, pp. V1-146. IEEE, 2010.

   > "The rapid development of economy and the deregulation of power industry increase the demand of power supply and grow the complexity of power grid. Since September 11, 2001 the security of major national infrastructures has become a critical concern to government and industry of any country. Power system is responsible for the continuous power supply but when some unpredicted disasters happen, especially earthquake, flood or terrorism attacks, operators have to guarantee the safety of the main part of the

system and the power supply of some important infrastructures, such as transportation, communication etc. So vulnerability prediction is made by assessing system conditions for credible contingencies, and how they are affected by the changes in a critical system parameter [1]."

4. Haidar, Ahmed M., Azah Mohamed, and Aini Hussain. "New method vulnerability assessment of power system." Journal of Applied Sciences 7 (6): pp.841-847 (2007).

   "Vulnerability assessment method based on anticipated loss of load: The Anticipated Loss of Load (ALL) index is the ammmt of loads shed due to a contingency in order to avoid a cascading outage. Since the purpose of vulnerability assessment is to avoid a catastrophic power outage, the vulnerability index should reflect the loads that may be lost at such times (Kim et al.. 2005)."

   "The system frequency is governed by this equilibrium and consequently any rmbalance in loads can result in frequency excursions that may lead to loss of synchronism. Excess of load results in a drop of system frequency and load shedding has to be employed in order to rapidly balance the demand and generation. To avoid system rmbalance, load shedding has to be implemented in which the amormt of load shed is considered as a vulnerability index (Kim et al . 2005)."

13.6.44 Time Scale Nonregressivity

Robert J. Marks II, Ian A. Gravagne, John M. Davis, and Jeffrey J. DaCunha. "Nonregressivity in switched linear circuits and mechanical systems." Mathematical and Computer Modelling 43, no. 11 (2006): 1383-1392 R.J. Marks II, Ian Gravagne, John M. Davis, Jeffrey J. DaCunha "Nonregressivity in Switched Linear Circuits and Mechanical Systems," Mathematical and Computer Modelling, vol. 43, pp.1383-1392, (2006).

1. Bartosiewicz, Zbigniew, Ewa Piotrowska, and Magorzata Wyrwas. "Stability, stabilization and observers of linear control systems on time scales." In Decision and Control, 2007 46th IEEE Conference on, pp. 2803-2808. IEEE, 2007.

   "[The] Baylor Time Scales Research Group is working on both theoretical and practical aspects of time-scales models. In particular, they use time-scales language for description of hybrid systems (see e.g. [6], [7])"

2. Choi, Sung Kyu, Yoon Hoe Goo, and Namjip Koo. "-Stability of Dynamic Equations on Time Scales with Nonregressivity." In Abstract and Applied Analysis, vol. 2008. Hindawi Publishing Corporation, 2008.

   "nonregressivity is always a possibility in discrete dynamical systems (e.g., difference equations), where the underlying domain consists of a mixture of discrete and continuous parts. In fact, if there is even one point in T with nonzero graininess, then nonregressivity is possible [8]."

   "System (3.2) is said to be regressive if

   $$\det[I + \mu A(t)] \neq 0 \qquad (3.3)$$

   for all $A \in T^k$ where I denotes the $n \times n$ identity matrix. It turns out that condition (3,3) is equivalent to having all of the eigenvalues of $Q(t)$ regressive in the sense of (1.2) [8]"

13.6.45 Protector, Refugee and Aggressor Swarms

I.A. Gravagne and R.J. Marks II, "Emergent Behaviors of Protector, Refugee and Aggressor Swarm," IEEE Transactions on Systems, Man and Cybernetics, Part B: Cybernetics, Volume 37, Issue 2, April 2007, pp. 471 - 476.

1. Purta, Rachael, Saurabh Nagrecha, and Gregory Madey. "Multi-hop Communications in a Swarm of UAVs." In Proceedings of the Agent-Directed Simulation Symposium, p. 5. Society for Computer Simulation International, 2013.

   "A description and evaluation of some of this model's properties can be found in [5], which analyzes the proper ties of clustering, drifting, and explosion that emerge from the model."

2. Purta, Rachael, Mikolaj Dobski, Artur Jaworski, and G. Madey. "A testbed for investigating the UAV swarm command and control problem using DDDAS." Procedia Computer Science 18 (2013): 2018-2027.

   "The swarm model we have chosen to use is based on the Icosystem swarm game, partially described on their website, http://www.icosystem.com/labsdemos/the-game/, and investigated for predictability in [24]."

13.6.46 Active Information

William A. Dembski and Robert J. Marks II, "Conservation of Information in Search: Measuring the Cost of Success," IEEE Transactions on Systems, Man and Cybernetics A, Systems and Humans, vol.39, #5, September 2009, pp.1051-1061

1. Garca-Martnez, Carlos, Francisco J. Rodriguez, and Manuel Lozano. "Arbitrary function optimisation with metaheuristics." Soft Computing 16, no. 12 (2012): 2115-2133.

   "In fact, most general-purpose solvers usually make the previous assumption, i.e., they assume that similar solutions (similar codings in practise, at least under a direct encoding (Garca-Martnez et al. 2011a,) are often expected to lead to similar objective values. In particular, in Dembski and Marks II (2009) it is pointed out that '...problem-specific information is almost always embedded in search algorithms. Yet, because this information can be so familiar, we can fail to notice its presence'. As some typical examples, we may annotate that knowledge may come from the encoding of solutions or the preference for exploring the neighbourhood of previous good solutions."

   "General-purpose search algorithms really apply common problem knowledge This is a fact that other authors had pointed out previously (Dembski and Marks II 2009). However, it was still unproven if that problem knowledge was effective on large sets of common problem classes. According to our experience, there are two sources of knowledge, not to be underestimated, that general-purpose algorithms may effectively apply (at least on the set of interesting binary problems):"

2. Mishra, Mohit, Utkarsh Chaturvedi, and K. K. Shukla. "Heuristic algorithm based on molecules optimizing their geometry in a crystal to solve the problem of integer factorization." Soft Computing (2015): 1-9.

   "To quantify the quality of an objective function, we analyze our objective functions based on conservation of information in search theory (Dembski and Marks 2009). "

3. Meyer, Stephen C. *Signature in the Cell.* The Blackwell Companion to Science and Christianity (2012): 270-282.

   "As Robert Marks has shown, scientists can now even measure the effect that intelligence produce in these experiments. Recall that Marks himself quantified the amount of active information that a computer program imparts into a system with each iteration as the result of the knowledge provided to it *by the programmer*. Clearly, ribozyme engineering and prebiotic simulations were also making use of informational input (Marks's "active information") as the experimenters made choices about which molecules to preserve and discard based upon their own knowledge of the desired outcomes."

4. Qu, Xinghua, Ran Zhang, Bo Liu, and Huifeng Li. "An improved TLBO based memetic algorithm for aerodynamic shape optimization." Engineering Applications of Artificial Intelligence 57 (2017): 1-15.

> "4.2. Conservation of information inspired operator
>
> "Conservation of information (COI) inspired theorem (Dembski and Marks, 2009) indicates that any search algorithm performs, on average, as well as random search without replacement unless it takes advantage of problem-specific information about the search target or the search-space structure. In other words, according to COI theorem, if we could take good advantage of the problem-specific information accumulated during the search, the augmented optimization algorithm could perform superior to the random search or at least the same as the random search on the whole domain of optimization problems. From this aspect, we could consider COI theorem as a guidance to design optimization algorithms not a concrete formula. To well utilize COI theorem, we may embody it into specific operators or formula. Driven by this COI belief, we enhance the original learning phase by introducing COI operator (conservation of information inspired operator), noticing that if both the current and historical information could be well utilized, an efficient learning could be achieved. In particular, in our COI, the current information utilized mainly refers to the interactions among the learners in current generation. The historical information utilized covers not only the personal best experience, but also the whole class's best experience. To enhance the exploitation ability, conservation of information inspired operators are incorporated to enrich the students learning behaviors by augmenting the simple differential variation between target individual and randomly selected one with more advanced information."

13.6.47 Transmitters for spectral conformity

Baylis, Charles, Lingfeng Wang, Matthew Moldovan, J. Martin, H. Miller, Lawrence Cohen, and Jean De Graaf. "Designing transmitters for spectral conformity: power amplifier design issues and strategies." IET radar, sonar & navigation 5, no. 6 (2011): 681-685.

1. Griffiths, Hugh, Shannon Blunt, Lawrence Cohen, and Laurent Savy. "Challenge problems in spectrum engineering and waveform diversity." In Radar Conference (RADAR), 2013 IEEE, pp. 1-5. IEEE, 2013.

> *E. Co-Design of Transmitter and Waveforms*
>
> "As follow-on to addressing transmitter effects there arises the possibility to jointly design the transmitter hardware and associated waveforms [13]. Such a strategy is a departure from traditional design methodology in which either the transmit hardware is fixed with the waveforms modified to suit or a class of waveforms is defined and the system specifications determined to meet the requirements."

13.6.48 Handbook of Fourier Analysis

R.J. Marks II, *Handbook of Fourier Analysis and Its Applications*, Oxford University Press, (2009).

1. Rowe, Barnaby, Christopher Hirata, and Jason Rhodes. "Optimal linear image combination." The Astrophysical Journal 741, no. 1 (2011): 46.

> "In the analysis of astronomical images, ensuring the adequate spatial sampling of data by pixels of finite size and spacing is a key concern. Ideally, images should be sampled at or above the NyquistShannon sampling rate for the band limit set by the optical response of the system (see, e.g., Marks 2009), so that the full continuous image can be determined from the discrete pixel samples."
>
> "The MTF is defined as the Fourier transform of the telescope PSF. The function $G_i(u)$ therefore represents the MTF conjugate $G_i(r)$, and themagnitude of this complex object

can be seen in Figure 2 for the two corresponding PSFs of Figure 1. As can be seen from Figure 2, the system is bandlimited at the fundamental frequency corresponding to $D/\lambda = 6.3026$ cycles arcsec^1. Therefore, a sampling interval of $\lambda/2D = 0.079333$ arcsec in the output image H_α is the requirement of critical sampling according to the sampling theorem (Marks 2009)."

2. Holighaus, Nicki, Monika Dorfler, Gino Angelo Velasco, and Thomas Grill. "A framework for invertible, real-time constant-Q transforms." Audio, Speech, and Language Processing, IEEE Transactions on 21, no. 4 (2013): 775-785.

   "In the present contribution, we are interested in inversion in the sense of perfect reconstruction; to this end, we investigate a new approach to constant-Q signal processing. The presented framework has the following core properties:

   1 Relying on concepts from frame theory, [Marks 15], we suggest the implementation of a constant-Q transform using the nonstationary Gabor transform (NSGT), which guarantees perfect invertibility. This perfectly invertible constant-Q transform is subsequently called constant-Q nonstationary Gabor transform (CQ-NSGT).

   2 We introduce a preprocessing step by slicing the signal to pieces of (usually uniform) finite length. Together with FFT-based methods, this allows for bounded delay and results in linear processing time. Thus, our algorithm lends itself to real-time processing and the resulting transform is referred to as sliced constant-Q transform (sliCQ).

3. Zuntz, Joe, Tomasz Kacprzak, Lisa Voigt, Michael Hirsch, Barnaby Rowe, and Sarah Bridle. "im3shape: a maximum likelihood galaxy shear measurement code for cosmic gravitational lensing." Monthly Notices of the Royal Astronomical Society 434, no. 2 (2013): 1604-1618.

   "However, representing the convolution of telescope PSFs with analytic, continuous, non-band-limited functions such as the Sérsic profile requires careful numerical approximation, as can (if the PSF is also not band limited) the subsequent rendering of convolved profiles into pixellated images (see e.g. Marks 2009). Decisions must be made about how and where to make approximations in the representation of these profiles, balancing precision against computational cost."

4. Rowe, Barnaby, David Bacon, Richard Massey, Catherine Heymans, Boris Huler, Andy Taylor, Jason Rhodes, and Yannick Mellier. "Flexion measurement in simulations of Hubble Space Telescope data." Monthly Notices of the Royal Astronomical Society 435, no. 1 (2013): 822-844.

   "Since shapelet models are no longer being used to describe galaxies after shear or flexion is applied, the convolution must be performed numerically using a pixelized image of this PSF. As a shapelet model PSF such as that in Fig. 3 is not formally band-limited (see e.g. Marks 2009), this therefore requires another empirical investigation into the effects of finite sampling."

5. Gö, Andreas, Helmut Seibert, and Dietmar Hildenbrand. "Registration of Multichannel Images using Geometric Algebra." In Workshop Proceedings: Computer Graphics, Computer Vision and Mathematics, pp. 07-10. 2010.

   "**3.2 Fourier-Mellin Transform**

   "In this Section we briefly introduce the application of the Fourier-Mellin Transform for registration of grayscaled images. All theorems and proofs according to the Fourier-Transform can be found in [10]. As in [10], we use the following definition of the Fourier-Transform of a function $f : \mathbb{R}^2 \to \mathbb{C}^2$"

6. Seshadri, Suresh, Charles Shapiro, Timothy Goodsall, Jason Fucik, C. Hirata, J. D. Rhodes, B. T. P. Rowe, and R. M. Smith. "Initial results from a laboratory emulation of weak gravitational lensing measurements." Publications of the Astronomical Society of the Pacific 125, no. 931 (2013): 1065-1086.

"These distortions arise due to the fact that both Swarp and Drizzle combine images via interpolation (with optional additional smoothing) across the input data: if these data are undersampled, the interpolated output will necessarily contain errors due to aliasing (Marks 2009). "

7. Wu, Li-Chung, Chia Chuen Kao, Tai-Wen Hsu, Yi-Fung Wang, and Jong-Hao Wang. "Spatial and temporal features of regional variations in mean sea level around Taiwan." Open Journal of Marine Science 2, no. 02 (2012): 58.

   "For the low frequency information from the wavelet scalogram, the time resolu- tion is poor but frequency resolution is high. When it is shifted toward high frequencies, the time resolution in- creases but the frequency resolution decreases. This is very similar to the Heisenberg Uncertainty Principle [16]"

8. Gallardo, Daniele, Riccardo Bevilacqua, and Onkar Sahni. "Data-based hybrid reduced order modeling for vortex-induced nonlinear fluidstructure interaction at low Reynolds numbers." Journal of Fluids and Structures 44 (2014): 115-128.

   "For the frequency model,an understanding of the time evolution of the dominant frequency in the force signal is needed. Identifying the dominant frequency at anytime point requires data from a local time window,i.e.,some steps before and after the time of interest,containing $S + 1$ samples.In this time window, the energy spectral density (ESD) is obtained through fast Fourier transformation (Marks, 2009) and performed with the purpose of determining the dominant force frequency ...."

9. Gallardo, Daniele, Riccardo Bevilacqua, and Onkar Sahni. "Data-based hybrid reduced order modeling for vortex-induced nonlinear fluidstructure interaction at low Reynolds numbers." Journal of Fluids and Structures 44 (2014): 115-128.

   "For minimizing the truncation error the kernel $s(t)$ must decrease rapidly when $t \to \infty$. The sinc function does not belong even to L_1. Therefore using the kernels in form $s(t) = \theta(t) \operatorname{sinc} t$ where $\theta(t)$ is some window function (see [11]), is well-known."

10. Le Zuo, Jin Pan, and Boyuan Ma. "Fast DOA estimation in the spectral domain and its applications." Progress In Electromagnetics Research 66 (2018): 73-85.

    "Since $\psi_i^*(n)$ is a complete set of orthonormal basis functions, Parsevals theorem for a complete set of orthonormal basis functions relates the signals energy to its expansion coefficients [36 (Marks)], i.e.,

    $$\sum_{n=1}^{K} |\Delta\Psi(n)|^2 = \frac{1}{K} \sum_{i=1}^{K} \varepsilon_i^2$$

    Therefore, the energy of the phase noises is evenly projected onto each spectrum..."

13.6.49 Search for the Search

William A. Dembski. and Robert J. Marks II, "The Search for a Search: Measuring the Information Cost of Higher Level Search," Journal of Advanced Computational Intelligence and Intelligent Informatics, Vol.14, No.5, 2010, pp. 475-486.

1. Garca-Martnez, Carlos, Francisco J. Rodriguez, and Manuel Lozano. "Arbitrary function optimisation with metaheuristics." Soft Computing 16, no. 12 (2012): 2115-2133.Garca-Martnez, Carlos, Francisco J. Rodriguez, and Manuel Lozano. "Arbitrary function optimisation with metaheuristics." Soft Computing 16, no. 12 (2012): 2115-2133.

> "Interestingly, some publications argue the combination as a medium for escaping from the NFL's claws (and in some cases, the combination is not even analysed with regard to the sole application of one of the approaches). Recently, Dembski and Marks II (2010) showed that NFL theorems apply to the concept of higher-level searchers, and thus, to combinations of algorithms as well. As for the multiobjective case, designing new algorithms as the combination of previous ones that perform more effectively and efficiently is still a possibility when regarding just the set of problems with practical interest."

2. Thomas, George. "Biogeography-Based Optimization of a Variable Camshaft Timing System." PhD Dissertation, Cleveland State University, 2014.

> "The Vertical No Free Lunch Theorem given [by Dembski & Marks] in [35] states that the difficulty of a search increases exponentially as more and more nested levels of search are added, unless some information about the higher level search spaces is known. This means that a search for optimal EA parameters is only useful if some information is already known about the search space for these parameters. As EA researchers, we know what ranges of EA parameters work well for problems in general, and so we can incorporate this information into a meta search that may yield a better EA for a given problem."

3. Sheldon, Robert B. "The cometary biosphere and the origin of life." In SPIE Optical Engineering+ Applications, pp. 815213-815213. International Society for Optics and Photonics, 2011.

> "Even worse, the space of search algorithms is even larger than the space of genome solutions, so it is not even possible to evolve a better search algorithm. Consider a 3×3 checkerboard with one checker somewhere on it. We can classify efficient search algorithms as those that search every cell once. There are 9! = 362,000 possible efficient search algorithms, whereas there are 9 possible configurations for the information. The search for a search is far worse than the search for just the information.[22] So this calculation of 10^{120} is a firm upper limit on the capabilities of uninformed searches in our universe. Random chance just does not have the probabilistic resources to find a living sequence."

4. Ergezer, M., and D. Simon. "Probabilistic Properties of Fitness-based Quasi-reflection in Evolutionary Algorithms." Computers & Operations Research (2015).

> "The presented results assume that the problem space is one-dimensional; however, they can be extended for higher dimensions. We assumed that the solution and the estimate have uniform distributions as in [32] and that the problem domain is symmetric such that $b = a$ to simplify the resulting mathematical expressions. As the algorithm converges, the distribution of the solution space may change. Thus, the next step should include studying the distribution of the search space and the corresponding opposition-based probabilities. As discussed in Algorithm 1, $\hat{x}_{Kr}$ applies opposition to the whole population. Future work should be made analyzing the effects of opposition on selected individuals. Finally, we limited the reflection weight to $K \in (0, 1)$ in this paper. Varying the range of K will create different opposition algorithms and can be a topic of further research."

13.6.50 EV Vivisection

George Montañez, Winston Ewert, William A. Dembski, and Robert J. Marks II, "Vivisection of the ev Computer Organism: Identifying Sources of Active Information," Biocomplexity, Vol. 2010, Issue 3, pp.1-6 (December 2010).

1. Meyer, Stephen C. *Signature in the Cell.* The Blackwell Companion to Science and Christianity (2012): 270-282.

> **Informational Accounting**

Recently, the senior engineering professor Robert Marks, formerly of the University of Washington, Seattle and now at Baylor University in Texas, analyzed evolutionary algorithms such as EV. Marks shows that despite claims to the contrary by their overly enthusiastic creators, algorithms such as EV do not produce large amounts of functionally specified information "from scratch." Marks shows that, instead, such algorithms succeed in generating the information they seck either by providing information about the desired outcome (the target) from the outset, or by adding information incrementally during the computer program's search for the target. To demonstrate this, Marks distinguishes and defines three distinct kinds of information: exogenous information, endogenous information, and active information.

"Endogenous information" represents the inforn1arion present in the target. Tt al o provide a measure ofth.e difficulty of the search for that target - that is, the improbability of finding the specific sequence or target, among the exponentially large space of alternative possibilities. Recall that the amount of information present in a sequence or system is inversely proportional to the probability of the sequence or system arising by chance. If the probability of finding the largest is small the information required to find the target is correspondingly large. By calculating the size of the pace of alternative possibilities in which the target resides, the computer scientist can determine both the probability of finding d1e target in a random search and the information content of the target in question. Marks's analysis of evolutionary algorithm show that, in order to produce or find the (endogenous) information present in the target, a programmer must design a search algorithm that reduces the in formation requirement of the search to a manageable level. The information added is the "active information." The "exogenous information" is what is left after the active information is subtracted fron1 the endogenous information. It measures the difficulty of the residual search problem.

In his critique of EV as well as other evolutionary algorithms, Marks. how that each of the e putatively successful simulations of undirected mutation and selection actually depends upon several sources of active information. The EV program, for example, uses active inforn1ation by applying a filter to favor sequences with the general profile of a nucleotide binding site. And it uses active information in each iteration of its evaluation algorithm or fitness function. The fitness function in EV uses information about the target sequence to assess degrees of difference between a prespecified target and the mutated sequence produced by the program. Those sequences that have the lowest error values - generate proximity to the prespecified functional sequence- are elected to replicate and mutate. Marks shows that each time the program uses knowledge of the target sequence to exclude some sequences and preserve others, it imparts a quantifiable amount of information in its selection. Marks quantifies these sources of active information and shows that they reduce the difficulty well below the 131 bits Schneider claims that EV can produce "from scratch." He also how that the endogenous information in even modestly difficult search problems usually cannot be generated (or the search problem solved) without added or "active" information to assist the search.

13.6.51 Going Nonlinear

Charles Baylis, Robert J. Marks II, Josh Martin, Hunter Miller, and Matthew Moldovan. "Going Nonlinear," IEEE Microwave Magazine, April 2011, pp.55-64

1. Yuanxiao Gou *et al.* "Analytical Reflection Coefficient Expressions Utilizing Load-Dependent X-Parameters." IEEE Transactions on Microwave Theory and Techniques, Year: 2015, Pages: 1 - 11, DOI: 10.1109/TMTT.2015.2470239

   "The matrix description of the X-parameter model is first applied in [Baylis *et al.*] [2]. It was originally employed to predict the performance of the amplifier under a well-defined multi-harmonic load condition. Specifically, the $X^(F)$ matrix gives the output spectrum phasor values at all combinations of the output port and harmonic. The $X^(S)$ and $X^(T)$

matrices represent the coupling or "cross-coupling" effects between the harmonic components of different ports. Moreover, because all the elements are correlated to the large-signal input A_{11} , the matrix representation will not damage the nonlinear features of the X-parameter model and the spectrum mapping relationships are still preserved."

2. Pelaez-Perez, A. M., S. Woodington, M. Fernandez-Barciela, Paul J. Tasker, and J. I. Alonso. "Large-signal oscillator design procedure utilizing analytical-parameters closed-form expressions." Microwave Theory and Techniques, IEEE Transactions on 60, no. 10 (2012): 3126-3136.

   "The main drawbacks of using computer-aided design (CAD) simulators are the time-consuming optimization steps, usually required in a fully numerical simulation-based circuit design. In order to speed up this design procedure, the availability of closed-form expressions would be convenient [3]. These allow for the direct computation of the nonlinear network performance, hence quickly providing an initial valid design solution. An example in this concept is the popular negative-resistance method for RF oscillator design, based mainly on -parameters. Although this approach gives acceptable insight, it cannot accurately predict oscillator behavior since it is only based on linear parameters."

3. Pelaez-Perez, A. M., S. Woodington, José Alonso, M. Fernandez-Barciela, and Paul J. Tasker. "X-parameters-based closed-form expressions for evaluating power-dependent fundamental negative and positive real impedance boundaries in oscillator design." Microwaves, Antennas & Propagation, IET 6, no. 8 (2012): 835-840.

   "The basic assumption is that, load-independent X-parameter coefficients can be used over a useable, extended, impedance region about the defined reference impedance to robustly predict large-signal response. The validity of this assumption is an obvious concern [8], hence will also be addressed in this paper."

4. Lee, Chie-In, Wei-Cheng Lin, and Yan-Ting Lin. "A 2.4 GHz high output power and high efficiency power amplifier operating at inductive breakdown in CMOS technology." Microelectronics Journal 45, no. 4 (2014): 449-453.

   "The X-parameter measurement can save time required to develop the nonlinear model [20], providing an alternative nonlinear circuit design approach. "

5. Kheirdoost, A., G. Moradi, and A. Abdipour. "An Analytical Formulation for Black Box Conversion Matrix Extraction." Microwave Theory and Techniques, IEEE Transactions on 60, no. 6 (2012): 1493-1499.

   "Here a simple methodology for extraction of the conversion matrix in nonlinear elements could be a valuable tool in microwave circuit design and analysis. The advent of Nonlinear Vector Network Analyzer (NVNA) and X Parameters concept [14] have made significant advances in design and modeling of nonlinear devices."

6. Urbina-Martinez, J. L., U. Malagon-Reyes, J. R. Loo-Yao, Pablo Moreno, and J. A. Reynoso-Hernandez. "X-parameters: The new tendency in the characterization of nonlinear RF devices."In Central America and Panama Convention (CONCAPAN XXXIV), 2014 IEEE, pp. 1-7. IEEE, 2014.

   "Los parámetros X se definen como un súper conjunto de parámetros S, los cuales simultáneamente están en función de la potencia, la frecuencia de la señal de entrada y el voltaje de operación en corriente directa (DC). El propósito principal de emplear los parómetros X, es el de obtener una caja negra que represente con exactitud al DBP, tanto en su región lineal como en la no lineal, evitando de esta manera el largo y complejo trabajo de desarrollar un modelo matemático no lineal que se ajuste al comportamiento del DBP, lo cual puede consumir varios meses [8]."

13.6.52 Radar chirp waveform selection

Josh Martin, Matthew Moldovan, Charles Baylis, Robert J.Marks II, Lawrence Cohen, Jean de Graaf, "Radar chirp waveform selection and circuit optimization using ACPR load-pull measurement," 2012 IEEE 13th Annual Wireless and Microwave Technology Conference (WAMICON), Florida, pp.1-4, 15-17 April 2012.
doi: 10.1109/WAMICON.2012.6208465

1. Zenteno, Efrain, Magnus Isaksson, and Peter Handel. "Output Impedance Mismatch Effects on the Linearity Performance of Digitally Predistorted Power Amplifiers." Microwave Theory and Techniques, IEEE Transactions on 63, no. 2 (2015): 754-765.

   > "..., under load impedance mismatch conditions, the linearized AB amplifier exhibits large variations of the in-band error (NMSE). However, due to its design, the same amplifier is robust to impedance mismatch conditions for the out-of-band error (ACPR). Therefore, AB amplifier architecture may be considered when out-of-band emissions and load impedance mismatches may occur. The minimization of the out-of-band error or any other metric can be done using load pull techniques [27]. These techniques can also provide, in the form of contours, the sensitivity to load impedance variations. For theDPD-linearized Doherty amplifier, both the NMSE and ACPR are vastly affected by load impedance mismatches, which is expected from the dynamic load modulation principle under which Doherty operates."

13.6.53 Chirp Waveform Selection

Josh Martin, Matthew Moldovan, Charles Baylis, Robert J.Marks II, Lawrence Cohen, Jean de Graaf, "Radar chirp waveform selection and circuit optimization using ACPR load-pull measurement," 2012 IEEE 13th Annual Wireless and Microwave Technology Conference (WAMICON), Florida, pp.1-4, 15-17 April 2012.

1. Zenteno, Efrain, Magnus Isaksson, and Peter Handel. "Output Impedance Mismatch Effects on the Linearity Performance of Digitally Predistorted Power Amplifiers." Microwave Theory and Techniques, IEEE Transactions on 63, no. 2 (2015): 754-765.

   > "Therefore, AB amplifier architecturemay be considered when out-of-band emissions and load impedance mismatches may occur. The minimization of the out-of-band error or any other metric can be done using load pull techniques [27]. These techniques can also provide, in the form of contours, the sensitivity to load impedance variations. For theDPD-linearized Doherty amplifier, both the NMSE and ACPR are vastly affected by load impedance mismatches, which is expected from the dynamic load modulation principle under which Doherty operates."

13.6.54 Spectrally Defined Reconfiguration

Charles Baylis, Josh Martin, Matthew Fellows, David Moon, Matt Moldovan, Lawrence Cohen, Robert J. Marks II, "Radar power amplifier circuit and waveform optimization for spectrally confined, reconfigurable radar systems," 2013 IEEE Radar Conference (RADAR), Ottawa, ON, Canada, April 29-May 3 2013, pp. 1-4.

1. Yuan-fang, Cao Si-yang Zheng. "Recent Developments in Radar Waveforms" Journal of Radars, Vol. 3, No. 5, Oct. 2014

   > "[Baylis et al.] [79] study designing spectral disjoint radar waveforms (also known as sparse frequency or thinned spectrum radar waveform) for avoiding detection of the transmitted signal by the enemy or collision with other wireless communication mechanisms."

13.6.55 Unexpected Swarms Behavior

Jon Roach, Winston Ewert, Robert J. Marks II and Benjamin B. Thompson, "Unexpected Emergent Behaviors From Elementary Swarms," Proceedings of the 2013 IEEE 45th Southeastern Symposium on Systems Theory (SSST), Baylor University, March 11, 2013, pp. 41 - 50.

1. Wilkenfeld, Daniel A., and Jennifer K. Hellmann. "Understanding beyond grasping propositions: A discussion of chess and fish." Studies in History and Philosophy of Science Part A 48 (2014): 46-51.

> "One area where modeling is required for understanding is in the appreciation of swarm behavior. Typically, swarms involve autonomous agents following simple rules that together produce an emergent behavior. (Roach, Ewert, Marks,& Thompson, 2013) Termites, for example, are governed by the following simple rules (Roach et al., 2013, p. 42):
>
> 1) Walk randomly until you encounter a grain.
>
> 2) If you have a grain, drop it.
>
> 3) If you do not have a grain, pick one up.
>
> 4) Repeat.
>
> "The result is a remarkable ability to clear an area of wood chips and form mounds. The location and formation of such mounds is not something one understands simply in virtue of knowing the four rules in question, or the state of the system at any particular time (including the start). What is striking about the example is that other than the four rules in question and the facts about the states of the system, there is nothing else about the system to know. Understanding the emergent behavior then cannot consist merely in some bit of knowledge. Some degree of simulation and practice is required."
>
> "The termite case is the simplest, but there is an array of swarm like behavior wherein simulations reveal complex emergent behavior arising from relatively simple rules governing individuals. For example, Roach et al. (2013) explore how trapping, cooperation, and confusion tactics can arise from very simple autonomous systems. None of these behaviors can be understood except by actually working through the models. Working through the model involves, at a minimum, grasping how the system evolved between any particular steps, but also being able to simultaneously simulate how the cumulative impact of such steps produced the end result."

13.6.56 Cognitive Radio Networks Using Game Theory

Liang Dong, Yanqing Liu and R.J. Marks II "Common Control Channel Assignment in Cognitive Radio Networks Using Potential Game Theory," IEEE Wireless Communications and Networking Conference (WCNC), Shanghai, China, 7-10 April 2013, pp. 315 - 320

1. Omar, Ankur. "Cache node determination, allocation and distribution in cognitive networks using game theory." In Telecommunication Networks and Applications Conference (ATNAC), 2014 Australasian, pp. 152-157. IEEE, 2014.

> "The normalization factor η is to ensure that the two utility criteria are approximately equally weighted when $\rho = 0.5$ [20]. We have:
>
> $$\eta = \frac{H\left[\sum_{j=1,j\neq i}^{N} I(f_i = f_j)\right]}{H\left[\theta_i(f_i)\right]} \quad (8)$$
>
> "Each SU sequentially updates its strategy to maximize its utility, and the potential function will reach a local maximum, and in finite steps will terminate to an NE [19], [20]."

13.6.57 Radar Power Amplifier Circuit and Waveform Optimization

Charles Baylis, Josh Martin, Matthew Fellows, David Moon, Matt Moldovan, Lawrence Cohen, Robert J. Marks II, "Radar power amplifier circuit and waveform optimization for spectrally confined, reconfigurable radar systems," 2013 IEEE Radar Conference (RADAR), Ottawa, ON, Canada, April 29-May 3 2013, pp. 1-4.

1. Gomez-Garcia, Roberto, Miguel-Angel Sanchez-Soriano, Kam-Weng Tam, and Quan Xue. "Flexible Filters: Reconfigurable-Bandwidth Bandpass Planar Filters with Ultralarge Tuning Ratio." Microwave Magazine, IEEE 15, no. 5 (2014): 43-54.

   > "It is unquestionable that a great effort is currently being directed toward the implementation of fully reconfigurable and multipurpose radio- frequency (RF) systems, aimed at developing quasiuniversal high-frequency transceiver modules. Examples of modern applications demanding such vast RF frequency agility are manifold; they encompass emerging cognitive/software-defined radios and multifunction radars with dynamic spectrum access capabilities to optimize their operation [1][3]."

13.6.58 Solving the Spectrum Crisis

Baylis, Charles, Matthew Fellows, Lawrence Cohen, and Robert J. Marks. "Solving the Spectrum Crisis: Intelligent, Reconfigurable Microwave Transmitter Amplifiers for Cognitive Radar." Microwave Magazine, IEEE 15, no. 5 (2014): 94-107.

1. Feger, Reinhard, and Andreas Stelzer. "Millimeter-wave radar systems on-chip and in package: Current status and future challenges." In Wireless Sensors and Sensor Networks (WiSNet), 2015 IEEE Topical Conference on, pp. 32-34. IEEE, 2015.

   > "Being able to reconfigure the radar system on the fly would allow to realize the vision of cognitive radars [5], [6 - Baylis et al.]. Such systems adapt their behavior, like, e.g., its beampattern and probing signal to the environment. This allows to optimize the achievable measurement performance for diverse scenarios, to identify and suppress interfering signals from other radars and to minimize disturbance of other radars."

2. Stark, Alexander, Nati Aharon, Thomas Unden, Daniel Louzon, Alexander Huck, Alex Retzker, Ulrik Lund Andersen, and Fedor Jelezko. "Narrow-bandwidth sensing of high-frequency fields with continuous dynamical decoupling." arXiv preprint arXiv:1706.04779 (2017).

   > "The application of this method for wireless communication [49-Baylis et al.] could have a transformative effect due to the high resolution of the protocol."

3. Pérez-Nicoli, Pablo, Fernando Silveira, Xun Zhang, and Amara Amara. "Uplink wireless transmission overview in bi-directional VLC systems." In Electronics, Circuits and Systems (ICECS), 2016 IEEE International Conference on, pp. 588-591. IEEE, 2016.

   > "In the last decade we have witnessed a dramatically increase in the number of mobile devices (MDs) used in the daily life. The same trend has occurred in the industry, where the fourth industrial revolution (Industry 4.0) is taking place [1-Baylis et al.]. It means there are more MDs wirelessly connected that are also able to take decentralized decisions. This revolution not only increases the automatization process but also introduces the possibility of self-optimization, self-configuration and self-diagnosis. This leads to high-end quality services or products with a more transparent commodity chain, increasing profit and reputation of the factories."

4. Greco, Maria S., Fulvio Gini, and Pietro Stinco. "Cognitive radars: Some applications." In Signal and Information Processing (GlobalSIP), 2016 IEEE Global Conference on, pp. 1077-1082. IEEE, 2016.

> "In active radars, cognition requests waveforms and circuits to be reconfigurable and optimizable in real time. Initial progress has been made in the two separate field [Bay12]"

5. Zai, Andrew, Mauricio Pinto, Mike Coffey, and Zoya Popović. "Supply-modulated radar transmitters with amplitude-modulated pulses." IEEE Transactions on Microwave Theory and Techniques 63, no. 9 (2015): 2953-2964.

> "The need for more bandwidth of wireless systems is beginning to impose more stringent requirements on radar emissions [3], [4-Baylis et al.]. Radars that operate in an increasingly congested spectral environment need to start behaving more like communications transmitters. Recently, there has been increased activity in improving the spectral properties of radars while maintaining the efficiency, e.g., optimizing the load of the PA for maximum efficiency compliant with a given adjacent channel power ratio (ACPR) [4-Baylis et al.]"