

Richard W. Selby

CURRENT POSITION

Director of Engineering
Northrop Grumman Aerospace Systems
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Adjunct Full Professor
University of Southern California
Data Sciences and Operations Department and Computer Science
Department
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SUMMARY

Research Interests:

Development, management, and economics of large-scale mission-critical systems, software, hardware, and processes
Technology management, analytics, and product development

Problem Domain Experience

Aerospace, Financial Services, and Information Technology.

Biography

Richard W. Selby is a Director of Engineering at Northrop Grumman Aerospace Systems in Redondo Beach, CA. He leads a very large product development organization and has served in this position since 2001. Previously, he was the Chief Technology Officer and Senior Vice President at Pacific Investment Management Company (PIMCO) in Newport Beach, CA where he managed a 105-person organization for three years. From 1985-1998, he was a Full Professor of Information and Computer Science (with tenure) at the University of California in Irvine, CA (UC Irvine).

He is an Adjunct Full Professor at the University of Southern California (USC) in Los Angeles, CA, and his faculty position has been in the Data Sciences and Operations Department since 2008 and also in the Computer Science Department since 2004. In 1993, he held visiting faculty

positions at the Massachusetts Institute of Technology (MIT) Sloan School of Management and Laboratory for Computer Science in Cambridge, MA, and in 1992, he held a visiting faculty position at the Osaka University Department of Information and Computer Science in Osaka, Japan.

His research focuses on development, management, and economics of large-scale mission-critical systems, software, hardware, and processes. He has authored over 125 refereed publications, authored or edited four books, given over 260 presentations at professional conferences and symposiums, delivered 13 conference keynote presentations, and served as Principal or Co-Principal Investigator of numerous research grants from the National Science Foundation (NSF) and Defense Advanced Research Projects Agency (DARPA). He co-authored an international best-selling book that analyzed Microsoft's technology, strategy, and management that was entitled *Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People*. The book, written with Michael Cusumano, has been translated into 12 languages, has 150,000 copies in print, and was ranked as a #6 best-seller in *Business Week*. He also edited the book *Software Engineering: Barry W. Boehm's Lifetime Contributions to Software Development, Management, and Research*. He has served on the editorial board or as a guest editor for the *IEEE Transactions on Big Data*, *IEEE Transactions on Software Engineering*, *Empirical Software Engineering*, *Software Quality*, and *Software Testing, Verification, and Reliability* journals. He has chaired or co-chaired the program committees for the International Conference on Business Analytics; International Forum on Systems, Software, and COCOMO Cost Modeling; International Symposium on Empirical Software Engineering and Measurement; Department of Defense Software in Acquisition Workshop; International Conference on Software Engineering (ICSE) Symposium summarizing the lifetime contributions of Barry Boehm; Northrop Grumman Conference on Net-Centric Systems; Northrop Grumman Conference on Software Engineering; and Northrop Grumman Conference on Systems Engineering. He has served on the Executive Committee for the IEEE Technical Council on Software Engineering (TCSE).

At Northrop and PIMCO, he was responsible for the successful strategy, development, and management of over 70 products that had over 420,000 system requirements and over 14,000,000 source lines of software code. At Northrop, he has served in numerous program management, functional management, and business development roles including as a Product Center Director, Integrated Project Team Manager, and/or Chief Engineer for the Advanced Mission Program (AMP), Air Force Advanced Extremely High Frequency (AEHF) satellite communications payload system, NASA Crew Exploration Vehicle (CEV) replacement for the Space Shuttle, and NASA Prometheus spacecraft to Jupiter. He helped acquire over \$1.2 billion in system and software development contracts and led the \$3 billion company to a successful enterprise-wide rating of Capability Maturity Model Integration (CMMI) Level 5 for Software. He chaired the corporate-wide Software Engineering Advisory Group, Achieving Competitive Excellence (ACE) Best Practices Initiative for Software, and Common Spacecraft Architecture Initiative for Software. He received the company's highest quality award, named after former President Tim W. Hannemann, for improvements in development, management, process, and quality. At PIMCO, he led the \$1 billion company to be ranked as the fourth most innovative technology organization in financial services, according to *Wall Street & Technology*. At UC Irvine, he

created the Amadeus measurement-driven analysis and feedback system and facilitated its usage in over 50 organizations worldwide.

He received his Ph.D. and M.S. degrees in Computer Science from the University of Maryland, College Park, MD in 1985 and 1983, respectively. He received his B.A. degree in Mathematics from St. Olaf College, Northfield, MN in 1981.

OUTLINE

Education and Professional Experience
Research
Service
Teaching

EDUCATION AND PROFESSIONAL EXPERIENCE

Personal Data

Residence: Newport Beach, CA. 949-400-8941, cell.

Education

B.A., Mathematics, cum laude, St. Olaf College, Northfield, MN, May 1981.
M.S., Computer Science, University of Maryland, College Park, MD, May 1983.
Ph.D., Computer Science, University of Maryland, College Park, MD, May 1985.

Academic Experience

University of Maryland, College Park, MD:

- ◆ 8/1981-12/1984: Research Assistant, Department of Computer Science.
- ◆ 1/1985-6/1985: Research Associate, Department of Computer Science.

University of California, Irvine, CA (“UC Irvine”):

- ◆ 7/1985-6/1991: Assistant Professor, Department of Information and Computer Science.
- ◆ 7/1991-6/1997: Associate Professor, Department of Information and Computer Science.
- ◆ 7/1997-6/1998: Full Professor, Department of Information and Computer Science.

Osaka University, Osaka, Japan (was on sabbatical from UC Irvine):

- ◆ 7/1992-12/1992: Visiting Associate Professor, Department of Information and Computer Science.

Massachusetts Institute of Technology (MIT), Cambridge, MA (was on sabbatical from UC Irvine):

- ◆ 1/1993-6/1993: Visiting Researcher, Laboratory for Computer Science.
- ◆ 1/1993-9/1993: Visiting Scholar, Sloan School of Management.

University of Southern California (USC), Los Angeles, CA:

- ◆ 8/2004-Present: Adjunct Full Professor, Computer Science Department, Viterbi School of Engineering.
- ◆ 11/2008-Present: Adjunct Full Professor, Data Sciences and Operations Department, Marshall School of Business.

Industry Experience

Pacific Investment Management Company (PIMCO), Newport Beach, CA (was on leave from UC Irvine):

- ◆ 5/1997-9/1999: Chief Technology Officer and Senior Vice President.

Acropolis Capital Management LLC and United States Business Exchange, Inc. (USBX), Santa Monica, CA:

- ◆ 9/1999-10/2001: Chief Technology Officer and Managing Director.

Northrop Grumman Aerospace Systems, Redondo Beach, CA:

- ◆ 10/2001-Present: Director of Engineering.

RESEARCH

Research Grants

1. Recipient, National Science Foundation, International Travel Grant, NATO Postdoctoral Fellowships Program, 1985 (\$1000).
2. Principal Investigator, "An Application of a Software Data Collection and Analysis Methodology in an IBM Environment," (with V. Basili as another Principal Investigator), IBM Corporation, Shared University Research (S.U.R.) Program, 1985-86 (\$96,883).
3. Principal Investigator, "Development and Evaluation of Software Cost and Quality Metrics," University of California, Irvine, Faculty Research Fellowship Program, 1986-87 (\$15,000).
4. Principal Investigator, "A Laboratory for Software Research," (with P. Langley, N. Leveson, L. Osterweil, D. Richardson, T. Standish and R. Taylor as other Principal Investigators), National Science Foundation grant DCR-8521398, Coordinated Experimental Research (C.E.R.) program, 1986-91 (\$3,130,100).
5. Principal Investigator, "Software Engineering," University of Maryland Foundation, 1987 (\$10,000).
6. Principal Investigator, "Evaluation of Software Testing Methods," University of California, Microelectronics Innovation and Computer Research Opportunities (MICRO) Program, co-sponsored by Hughes Aircraft Co., 1987-88 (\$35,750).
7. Co-Principal Investigator, "Software Environments Supporting the Development of Reliable Concurrent and Real-Time Software," (with R. Taylor as Principal Investigator), National Science Foundation grant CCR-8704311, in cooperation with Defense Advanced Research

- Projects Agency (DARPA), ARPA order 6108, program code 7T10, Information Science and Technology Office, 1987-91 (\$2,170,000).
8. Principal Investigator, "Graphical Presentation of Software Project Data," University of California, Microelectronics Innovation and Computer Research Opportunities (MICRO) Program, co-sponsored by TRW, 1988-89 (\$23,000).
 9. Principal Investigator, "Error Localization During Software Integration," University of California, Microelectronics Innovation and Computer Research Opportunities (MICRO) Program, co-sponsored by Hughes Aircraft Co., 1988-89 (\$30,800).
 10. Principal Investigator, "Generating and Evaluating Measurement-Based Models of Error-Prone Software Objects," University of California, Microelectronics Innovation and Computer Research Opportunities (MICRO) Program, co-sponsored by Hughes Aircraft Co., 1989-90 (\$37,400).
 11. Principal Investigator, "Interconnectivity Analysis Techniques for Large-Scale Software," University of California, Microelectronics Innovation and Computer Research Opportunities (MICRO) Program, co-sponsored by TRW, 1990-91 (\$23,000).
 12. Principal Investigator, "Scalable Techniques for Generating Measurement-Based Models of Error-Prone Software Objects," University of California, Microelectronics Innovation and Computer Research Opportunities (MICRO) Program, co-sponsored by Hughes Aircraft Co., 1990-91 (\$23,000).
 13. Principal Investigator, "Interconnectivity Analysis Techniques for Feedback and Improvement in Large-Scale Software," University of California, Microelectronics Innovation and Computer Research Opportunities (MICRO) Program, co-sponsored by TRW, 1991-92 (\$50,000).
 14. Co-Principal Investigator, "Infrastructure and Components for Team-Based Development, Analysis, and Maintenance of Incrementally Improved Software Systems," (with R. Taylor as Principal Investigator), Defense Advanced Research Projects Agency (DARPA), Grant MDA972-91-J-1010, ARPA order 8181, program code 2D30, Information Science and Technology Office, 1991-94 (\$2,507,000).
 15. Principal Investigator, "Experimental Software Engineering," (with V. Basili and D. Rombach as other Principal Investigators), University of Kaiserslautern, Germany, 1992 (\$50,000).
 16. Principal Investigator, "Measurement-Driven Interconnectivity Analysis Techniques for Modeling Software Designs," University of California, Microelectronics Innovation and Computer Research Opportunities (MICRO) Program, co-sponsored by TRW, 1992-93 (\$43,250).
 17. Principal Investigator, "Research in Advanced Environments," (with R. Taylor, D. Richardson, and M. Young as other Principal Investigators), Defense Advanced Research

Projects Agency (DARPA), Information Science and Technology Office, administered through Rome Laboratory, 1994-97 (\$2,975,426).

18. Sponsor and Project Review Authority, "Integrated Avionics: Reusable, Reconfigurable Software Architectures and Components for Advanced Spacecraft Platforms," Northrop Grumman Space Technology, Internal Research and Development (IRAD), 2002-05 (\$10,500,000).
19. Principal Investigator, "Executable Architectures for Modeling and Analysis of Large-Scale Systems," Northrop Grumman Space Technology, Internal Research and Development (IRAD), 2005 (\$200,000).
20. Principal Investigator, "Portable Satellite Communications Software Product Architecture," Northrop Grumman Space Technology, Internal Research and Development (IRAD), 2008 (\$200,000).

Refereed Books

1. Victor Basili, Dieter Rombach, and Richard W. Selby, Editors, *Experimental Software Engineering Issues: Critical Assessment and Future Directions*, Lecture Notes in Computer Science, Volume 706, Springer-Verlag, Berlin, 1993.
2. Michael A. Cusumano and Richard W. Selby, *Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People*, Free Press, Simon & Schuster, New York, October 1995.
 - A. Japanese translation by Nihon Kezai Shimbun.
 - B. German translation by Haufe Verlag.
 - C. Hebrew translation and audio by International Library for Business People.
 - D. Korean translation by Samsung Economic Research Institute.
 - E. Chinese translation by China Times Publishing.
 - F. Polish translation by Emka Studio.
 - G. Portuguese translation by Editora Atica S.A.
 - H. U.K. and Commonwealth version by HarperCollins U.K.
 - I. Bahasa Indonesian translation by Simon and Schuster Asia.
 - J. Thai translation by Khoo Khaeng Ltd.

- K. Spanish translation by Prentice Hall Hispanoamericana.
 - L. Serbian translation by Kompjuter Biblioteka.
3. Victor Basili, Dieter Rombach, Kurt Schneider, Barbara Kitchenham, Dietmar Pfahl, and Richard W. Selby, Editors, *Empirical Software Engineering Issues: Critical Assessment and Future Directions*, Lecture Notes in Computer Science, Volume 4336, Springer-Verlag, Berlin, 2007, ISBN 978-3-540-71300-5.
 4. Richard W. Selby, Editor, *Software Engineering: Barry W. Boehm's Lifetime Contributions to Software Development, Management, and Research*, John Wiley & Sons, New York, May 2007, ISBN 978-0-470-14873-0.

Refereed Book Chapters and Articles

5. Richard W. Selby, "Empirically Analyzing Software Reuse in a Production Environment," *Software Reuse -- Emerging Technology*, editor Will Tracz, IEEE Computer Society, New York, 1988, pp. 176-189.
 - A. Reprinted in *Management of Applications Software*, edited by Datapro Research, McGraw-Hill Information Services Co., Delran, NJ, 1989.
6. Richard W. Selby, "Quantitative Studies of Software Reuse," *Software Reusability*, Volume II, editors Ted J. Biggerstaff and Alan J. Perlis, Addison-Wesley, Reading, MA, 1989, pp. 213-233.
7. Richard W. Selby, "Software Measurement and Experimentation Frameworks, Mechanisms, and Infrastructure," *Experimental Software Engineering Issues: Critical Assessment and Future Directions*, editors Victor Basili, Dieter Rombach, and Richard W. Selby, Lecture Notes in Computer Science, Volume 706, Springer-Verlag, Berlin, 1993, pp. 89-104.
8. Richard W. Selby, "Data Collection, Analysis, and Sharing Strategies for Enabling Software Measurement and Model Building," *Empirical Software Engineering Issues: Critical Assessment and Future Directions*, editors Victor Basili, Dieter Rombach, Kurt Schneider, Barbara Kitchenham, Dietmar Pfahl, and Richard W. Selby, Lecture Notes in Computer Science, Volume 4336, Springer-Verlag, Berlin, 2007, pp. 70-76.
9. Richard W. Selby, "Empirical Software Engineering Research Roadmap," *Empirical Software Engineering Issues: Critical Assessment and Future Directions*, editors Victor Basili, Dieter Rombach, Kurt Schneider, Barbara Kitchenham, Dietmar Pfahl, and Richard W. Selby, Lecture Notes in Computer Science, Volume 4336, Springer-Verlag, Berlin, 2007, pp. 168-171, 184-187.
10. Richard W. Selby, "Introduction to Software Economics," *Software Engineering: Barry W. Boehm's Lifetime Contributions to Software Development, Management, and Research*, editor Richard W. Selby, John Wiley & Sons, New York, May 2007, pp. 87-90.

Refereed Journal Articles

11. Victor R. Basili, Richard W. Selby and Tsai-Yun Phillips, "Metric Analysis and Data Validation across Fortran Projects," *IEEE Transactions on Software Engineering*, Vol. SE-9, No. 6, Nov. 1983, pp. 652-663.
12. Victor R. Basili, Richard W. Selby and David H. Hutchens, "Experimentation in Software Engineering," *IEEE Transactions on Software Engineering*, Vol. SE-12, No. 7, July 1986, pp. 733-743.
 - A. Reprinted in *Foundations of Empirical Software Engineering: The Legacy of Victor R. Basili*, editors Barry Boehm, Dieter Rombach, and Marvin Zelkowitz, Springer-Verlag, Berlin, May 2005, pp. 278-299.
13. Richard W. Selby, Victor R. Basili and F. Terry Baker, "Cleanroom Software Development: An Empirical Evaluation," *IEEE Transactions on Software Engineering*, Vol. SE-13, No. 9, September 1987, pp. 1027-1037.
 - A. Reprinted in *Software State-of-the-Art: Selected Papers*, editors Tom DeMarco and Tim Lister, Dorset House Publishing, New York, 1990, pp. 256-276.
 - B. Reprinted in *Foundations of Empirical Software Engineering: The Legacy of Victor R. Basili*, editors Barry Boehm, Dieter Rombach, and Marvin Zelkowitz, Springer-Verlag, Berlin, May 2005, pp. 339-361.
14. Victor R. Basili and Richard W. Selby, "Comparing the Effectiveness of Software Testing Strategies," *IEEE Transactions on Software Engineering*, Vol. SE-13, No. 12, December 1987, pp. 1278-1296.
 - A. Reprinted in *Foundations of Empirical Software Engineering: The Legacy of Victor R. Basili*, editors Barry Boehm, Dieter Rombach, and Marvin Zelkowitz, Springer-Verlag, Berlin, May 2005, pp. 300-338.
15. Richard W. Selby and Adam A. Porter, "Learning from Examples: Generation and Evaluation of Decision Trees for Software Resource Analysis," *IEEE Transactions on Software Engineering*, Vol. SE-14, No. 12, December 1988, pp. 1743-1757.
16. Adam A. Porter and Richard W. Selby, "Empirically Guided Software Development Using Metric-Based Classification Trees," *IEEE Software*, Vol. 7, No. 2, March 1990, pp. 46-54.
17. Adam A. Porter and Richard W. Selby, "Evaluating Techniques for Generating Metric-Based Classification Trees," *Journal of Systems and Software*, Vol. 12, No. 3, July 1990, pp. 209-218.

18. Richard W. Selby, "Empirically Based Analysis of Failures in Software Systems," *IEEE Transactions on Reliability*, Vol. 39, No. 4, October 1990, pp. 444-454.
19. Richard W. Selby, "Extensible Integration Frameworks for Software Measurements," *IEEE Software*, Vol. 7, No. 6, November 1990, pp. 83-84, 112.
20. Victor R. Basili and Richard W. Selby, "Paradigms for Experimentation and Empirical Studies in Software Engineering," *Journal of Reliability Engineering and System Safety*, Elsevier Science Publishers Ltd, Essex, England, Vol. 32, No. 1-2, 1991, pp. 171-191.
 - A. Reprinted in *Software Reliability and Safety*, editors Bev Littlewood and Simon Pickford, Elsevier Science Publishers Ltd, Essex, England, 1991.
21. Richard W. Selby and Victor R. Basili, "Analyzing Error-Prone System Structure," *IEEE Transactions on Software Engineering*, Vol. SE-17, No. 2, February 1991, pp. 141-152.
22. Richard W. Selby and Koji Torii, "Introduction to Software Measurement Principles, Techniques, and Environments," *IEEE Transactions on Software Engineering*, Vol. SE-18, No. 11, November 1992, pp. 929-930.
23. Richard W. Selby, "Interconnectivity Analysis Techniques for Error Localization in Large Systems," *Journal of Systems and Software*, Vol. 20, No. 3, March 1993, pp. 267-272.
24. Aaron Goldstein, Hal Hart, and Richard W. Selby, "The Amadeus Measurement System: STARS Automated, Integrated Approach to Quality, Management, and Process Measurement," *SIG Technology Review Journal*, Vol. 2, No. 1, Summer 1994, pp. 41-56.
25. Barry Boehm, Bradford Clark, Ellis Horowitz, Chris Westland, Ray Madachy, and Richard W. Selby, "Cost Models for Future Software Lifecycle Processes: COCOMO 2.0," *Annals of Software Engineering*, Vol. 1, 1995, pp. 57-94.
 - A. Reprinted in *Software Engineering: Barry W. Boehm's Lifetime Contributions to Software Development, Management, and Research*, editor Richard W. Selby, John Wiley & Sons, New York, May 2007.
26. Michael A. Cusumano and Richard W. Selby, "How Microsoft Competes," *Journal of Research and Technology Management*, Vol. 39, No. 1, January-February 1996, pp. 26-30.
27. Barry Boehm, Bradford Clark, Ellis Horowitz, Chris Westland, Ray Madachy, and Richard W. Selby, "The COCOMO 2.0 Software Cost Estimation Model," *American Programmer*, Vol. 9, No. 7, July 1996, pp. 2-17.
28. Larry Holmquist, Will Tracz, and Richard W. Selby, "An Evaluation of Domain-Specific Software Architecture (DSSA) Avionics Domain Application Generation Environment (ADAGE) Technology," *CrossTalk: The Journal of Defense Software Engineering*, December 1996, pp. 25-28.

29. Michael A. Cusumano and Richard W. Selby, "How Microsoft Builds Software," *Communications of the ACM*, Vol. 40, No. 6, June 1997, pp. 53-61.
30. Michael A. Cusumano and Richard W. Selby, "Microsoft's Weaknesses in Software Development," *American Programmer*, Vol. 10, No. 10, October 1997.
31. Richard W. Selby, "PIMCO = People + Technology," *Pacific Investment Management Company Quarterly Financial Review*, January-March 1998.
32. Richard W. Selby, "Year 2000 Problem (Y2K): Financial Market Challenges and Solutions," *Pacific Investment Management Company Quarterly Financial Review*, January-March 1999.
33. Richard W. Selby, "Enabling Reuse-Based Software Development of Large-Scale Systems," *IEEE Transactions on Software Engineering*, Vol. SE-31, No. 6, June 2005, pp. 495-510.
34. Richard W. Selby, "Analytics-Driven Dashboards Enable Leading Indicators for Requirements and Designs of Large-Scale Systems," *IEEE Software*, Vol. 26, No. 1, January/February 2009, pp. 41-49.

Refereed Conference and Workshop Proceedings Articles

35. Dale Larson, Kathryn Lenz, Barry Mason, Thomas Savage and Richard W. Selby, "Parameter Estimation for Linear Combinations of Exponential Functions," *Proceedings of the Mathematical Association of America North Central Conference*, Mankato State University, Mankato, MN, May 1-2, 1981.
36. Richard W. Selby, "An Empirical Study Comparing Software Testing Techniques," *Proceedings of the Sixth Minnowbrook Workshop on Software Performance Evaluation*, Blue Mountain Lake, NY, July 19-22, 1983 (Refereed abstract).
37. Richard W. Selby, "A Characteristic Software Metric Set," *Proceedings of the Seventh Minnowbrook Workshop on Software Performance Evaluation*, Blue Mountain Lake, NY, July 24-27, 1984, pp. 77-78 (Refereed abstract).
38. Victor R. Basili and Richard W. Selby, "Data Collection and Analysis in Software Research and Management," *Proceedings of the American Statistical Association, Statistical Computing Section*, Philadelphia, PA, August 13-16, 1984, pp. 21-30.
39. Richard W. Selby, Victor R. Basili, Jerry Page and Frank E. McGarry, "Evaluating Software Testing Strategies," *Proceedings of the Ninth Annual Software Engineering Workshop*, NASA/Goddard Space Flight Center, Greenbelt, MD, November 28, 1984, pp. 42-64.
40. H. Dieter Rombach and Richard W. Selby, "The Use and Interpretation of Characteristic Software Metric Sets with Change, Error, and Fault Data," *Proceedings of the National Joint Conference on Software Quality and Productivity*, Williamsburg, VA, March 6-8, 1985.

41. Richard W. Selby, "Software Engineering," *Proceedings of the Fifteenth Annual Virginia Computer Users Conference*, Blacksburg, VA, May 3-4, 1985.
42. Victor R. Basili and Richard W. Selby, "Four Applications of a Software Data Collection and Analysis Methodology," *Proceedings of the NATO Advanced Study Institute*, Durham, U.K., July 29 - August 10, 1985.
 - A. Reprinted in *Software System Design Methods: The Challenge of Advanced Computing Technology*, editor Jozef K. Skwirzynski, Springer-Verlag, Berlin, NATO ASI Series F: Vol. 22, 1986, pp. 3-33.
43. Victor R. Basili and Richard W. Selby, "Calculation and Use of an Environment's Characteristic Software Metric Set," *Proceedings of the Eighth International Conference on Software Engineering*, London, U.K., August 28-30, 1985, pp. 386-391 (>260 papers submitted, 49 accepted; a 5:1 ratio).
44. Richard W. Selby, "Combining Software Testing Strategies: An Empirical Evaluation," *Proceedings of the ACM SIGSOFT & IEEE Computer Society Workshop on Software Testing*, Banff, Canada, July 15-17, 1986, pp. 82-90 (43 papers submitted, 18 accepted; a 2.4:1 ratio).
45. Victor R. Basili, Dieter Rombach, and Richard W. Selby, "The Role of Code Reading in the Software Life Cycle," *Proceedings of the Ninth Minnowbrook Workshop on Software Performance Evaluation*, Blue Mountain Lake, NY, August 5-8, 1986 (Refereed abstract).
46. Richard W. Selby, "Incorporating Metrics into a Software Environment," *Proceedings of the Joint Ada Conference: Fifth National Conference on Ada Technology and Washington Ada Symposium*, Arlington, VA, March 16-19, 1987, pp. 326-333 (105 papers submitted, 64 accepted; a 1.6:1 ratio).
47. Richard W. Selby, "Analyzing Software Reuse at the Project and Module Design Levels," *Proceedings of the First European Software Engineering Conference*, Strasbourg, France, September 9-11, 1987, pp. 227-235 (>200 papers submitted, 40 accepted; a 5:1 ratio).
 - A. Reprinted in *Lecture Notes in Computer Science*, editors H. K. Nichols and D. Simpson, Vol. 289, Springer-Verlag, Berlin, 1987, pp. 212-220.
48. Richard W. Selby, "Automatically Generating Software Metric Decision Trees for Identifying Error-Prone and Costly Modules," *Proceedings of the Twelfth Annual Software Engineering Workshop*, NASA/Goddard Space Flight Center, Greenbelt, MD, December 2, 1987.
49. Richard W. Selby, "Generating Hierarchical System Descriptions for Software Error Localization," *Proceedings of the ACM SIGSOFT & IEEE Computer Society Second Workshop on Software Testing, Verification, and Analysis*, Banff, Canada, July 19-21, 1988, pp. 89-96 (50 papers submitted, 25 accepted; a 2:1 ratio).

50. Richard W. Selby and Victor R. Basili, "Error Localization During Software Maintenance: Generating Hierarchical System Descriptions from the Source Code Alone," *Proceedings of the ACM SIGSOFT & IEEE Computer Society Conference on Software Maintenance*, Phoenix, AZ, October 24-27, 1988, pp. 192-197 (89 papers submitted, 54 accepted; a 1.6:1 ratio).
51. Richard N. Taylor, Frank C. Belz, Lori A. Clarke, Leon J. Osterweil, Richard W. Selby, Jack C. Wileden, Alexander L. Wolf, and Michal Young, "Foundations for the Arcadia Environment Architecture," *Proceedings of the ACM SIGSOFT/SIGPLAN Third Symposium on Software Development Environments (SDE3, ACM SIGSOFT 88)*, Boston, MA, November 28-30, 1988, pp. 1-13 (>130 papers submitted, 22 accepted; a 5:1 ratio).
 - A. Also published in *ACM SIGSOFT Software Engineering Notes*, Vol. 13, No. 5, November 1988, pp.1-13.
 - B. Reviewed in *Computing Reviews*, Vol. 31, No. 5, May 1990, pp. 260-261.
52. Richard W. Selby, "Empirically Based Classification Trees as Metric Integration Frameworks," *Proceedings of the Twelfth Minnowbrook Workshop: Software Engineering for Parallel Computing*, Blue Mountain Lake, NY, July 25-28, 1989, pp. 128-135.
53. Richard W. Selby and Adam A. Porter, "Software Metric Classification Trees Help Guide the Maintenance of Large-Scale Systems," *Proceedings of the ACM SIGSOFT & IEEE Computer Society Conference on Software Maintenance*, Miami, FL, October 16-19, 1989, pp. 116-123 (61 papers submitted, 30 accepted; a 2:1 ratio).
54. Richard W. Selby, Greg James, Kent Madsen, Joan Mahoney, Adam Porter and Doug Schmidt, "Classification Tree Analysis Using the Amadeus Measurement and Empirical Analysis System," *Proceedings of the Fourteenth Annual Software Engineering Workshop*, NASA/Goddard Space Flight Center, Greenbelt, MD, November 29, 1989 (>50 papers submitted, 9 accepted; a 5:1 ratio).
55. Adam A. Porter and Richard W. Selby, "Evaluating Techniques for Generating Metric-Based Classification Trees," *Proceedings of the Second Annual Oregon Workshop on Software Metrics*, Portland, OR, March 19-20, 1990.
56. Richard W. Selby, "Scalable Techniques for Modeling Software Interconnectivity," *Proceedings of the 22nd Symposium on the Interface: Computing Science and Statistics (Interface '90)*, East Lansing, MI, May 17-19, 1990.
57. Douglas C. Schmidt and Richard W. Selby, "Modeling Software Interconnectivity," *Proceedings of the 22nd Symposium on the Interface: Computing Science and Statistics (Interface '90)*, East Lansing, MI, May 17-19, 1990.
58. Richard W. Selby, Adam A. Porter and R. Kent Madsen, "Metric-Driven Classification Models," *Proceedings of the Thirteenth Minnowbrook Software Engineering Workshop*, Blue Mountain Lake, NY, July 24-27, 1990 (Refereed abstract).

59. Richard W. Selby, "Measurement and User Interfaces in the Arcadia Environment," *Proceedings of the ACM SIGAda Conference*, Redondo Beach, CA, August 20-24, 1990 (Refereed abstract).
60. R. Kent Madsen and Richard W. Selby, "Metric-Driven Classification Networks for Identifying High-Risk Software Components," *Proceedings of the International Conference on Applications of Software Measurement*, San Diego, CA, November 12-14, 1990.
61. Richard W. Selby, "Process Measurement, Feedback, and Improvement," *Proceedings of the Third International Workshop on Software Quality Improvement*, Tokyo, Japan, January 21-26, 1991.
62. Richard W. Selby, "Systematic Quality Improvement Using Metric-Driven Analysis Techniques and Feedback Systems," *Proceedings of the Third International Workshop on Software Quality Improvement*, Tokyo, Japan, January 21-26, 1991.
63. Richard W. Selby, Adam A. Porter, Doug C. Schmidt and Jim Berney, "Metric-Driven Analysis and Feedback Systems for Enabling Empirically Guided Software Development," *Proceedings of the Thirteenth International Conference on Software Engineering*, Austin, TX, May 13-16, 1991, pp. 288-298.
64. Richard W. Selby, "Measurement-Driven Analysis and Feedback Processes," *Proceedings of the Fourth Quality Week Conference*, San Francisco, CA, May 14-17, 1991.
65. Richard W. Selby, "Measurement-Driven Analysis and Feedback Systems," *Proceedings of the International Symposium on Future Software Environments*, Hikone, Japan, June 13-14, 1991 (Refereed abstract).
66. Richard W. Selby, "Measurement Principles, Techniques, and Systems for Achieving Empirically Guided Software Development and Evolution," *Proceedings of the Third Annual Software Quality Workshop*, Alexandria Bay, NY, August 12-15, 1991.
67. Richard W. Selby, "Experimental Computer Science," *Proceedings of the Workshop on Research in Experimental Computer Science*, Palo Alto, CA, October 16-18, 1991.
68. Richard W. Selby and R. Kent Madsen, "Metric-Driven Classification Analysis," *Proceedings of the Third European Software Engineering Conference*, Milan, Italy, October 22-24, 1991 (132 papers submitted, 22 accepted; a 6:1 ratio).
 - A. Reprinted in *Lecture Notes in Computer Science*, Vol. 550, Springer-Verlag, Berlin, 1991, pp. 290-307.
69. Richard W. Selby, "Measurement-Driven Analysis Techniques for Systematic Process Improvement," *Proceedings of the International Software Quality Exchange (ISQE) Conference*, San Francisco, CA, March 10-11, 1992.

70. Richard W. Selby, "Interconnectivity Analysis Techniques for Error Localization in Large Systems," *Proceedings of the Fourth Annual Oregon Workshop on Software Metrics*, Portland, OR, March 22-24, 1992.
71. Richard W. Selby, "Amadeus Measurement-Driven Analysis and Feedback System," *Proceedings of the DARPA Software Technology Conference*, Los Angeles, CA, April 27-30, 1992.
72. R. Kadia, "Lessons from the Arcadia Project," *Proceedings of the DARPA Software Technology Conference*, Los Angeles, CA, April 27-30, 1992. (Note: "R. Kadia" is a name for the 10 Arcadia project Principal Investigators, which includes myself.)
73. Lou Coglianesi, Will Tracz, Don Batory, Kirstie Bellman, Rodger Fritz, Mark Goodwin, David Gries, David McAllester, Richard W. Selby, and Richard Taylor, "Avionics Domain Specific Software Architecture Environment (ADAGE)," *Proceedings of the DARPA Software Technology Conference*, Los Angeles, CA, April 27-30, 1992.
74. Richard W. Selby, "Empirical Analysis of Failures in Software Systems," *Proceedings of the Software Reliability Conference*, Nara, Japan, November 5-6, 1992.
75. Richard W. Selby, "Measurement-Driven Analysis and Feedback Systems," *Proceedings of the Software Technology for Adaptable, Reliable Systems Conference (STARS'92)*, Washington, D.C., December 7-9, 1992.
76. R. Kadia, "Cross-Cutting Technical Issues in a Flexible Software Development Environment: Lessons from the Arcadia Project," *Proceedings of the ACM SIGSOFT Fifth Symposium on Software Development Environments (SDE5)*, Washington, D.C., December 9-11, 1992. (Note: "R. Kadia" is a name for the 10 Arcadia project Principal Investigators, which includes myself.)
77. Hal Hart, Aaron Goldstein, and Richard W. Selby, "The Amadeus Measurement System," *Proceedings of the Software Technology Conference*, Salt Lake City, Utah, April 20-22, 1993.
78. Richard W. Selby, "Automated Measurement Systems," *Proceedings of the CECOM Software Metrics Conference*, Ft. Monmouth, NJ, November 17-18, 1993.
79. Richard W. Selby and Amrit Goel, "Strategy for Design and Evolution of an Information Base, Products, and Results," *Proceedings of the Software Quality Conference (Cooperstown II)*, Alexandria Bay, NY, August 14-17, 1994.
80. Richard W. Selby, "Example Uses of Automated Software Measurement," *Proceedings of the CECOM Software Metrics Conference*, Ft. Monmouth, NJ, November 15-16, 1994.
81. Richard W. Selby and Ron Reimer, "Interconnectivity Analysis for Large Software Systems," *Proceedings of the California Software Symposium*, Irvine, CA, March 30, 1995.

82. Barry W. Boehm, Bradford Clark, Ellis Horowitz, Ray Madachy, Richard W. Selby, and Chris Westland, "An Overview of the COCOMO 2.0 Software Cost Model," *Proceedings of the Seventh Annual Software Technology Conference*, Salt Lake City, UT, April 1995.
83. Barry W. Boehm, Bradford Clark, Ellis Horowitz, Chris Westland, Ray Madachy, and Richard W. Selby, "The COCOMO 2.0 Software Cost Estimation Model," *Proceedings of the International Society of Parametric Analysts*, May 1995.
84. Richard W. Selby and Doris Tonne, "Size Measurement," *Proceedings of the COCOMO 2.0 Workshop*, University of Southern California, Los Angeles, CA, May 16-18, 1995.
85. Judy Lettes and Richard W. Selby, "Lessons Learned from Software Measurement," *Proceedings of the CECOM Software Metrics Conference*, Ft. Monmouth, NJ, January 17-18, 1996.
86. Richard W. Selby, "Lessons Learned from Microsoft Software Development Practices," *Proceedings of the Conference for Federal Government Computing Managers*, Brookings Institute, Biltmore Hotel, Los Angeles, CA, March 25, 1996.
87. Richard W. Selby, "Platforms for Software Execution: Databases vs. Operating Systems vs. Browsers," *Proceedings of the 19th International Conference on Software Engineering (ICSE '97)*, Boston, MA, May 17-23, 1997 (Refereed abstract).
88. Richard W. Selby, "Rapidly Developing Feature-Rich Applications in a Structured Environment," *Proceedings of the Institutional Investor Conference on Financial Technology*, New York, NY, January 26-30, 1998.
89. Richard W. Selby, "Software Engineering Processes and Environments for Financial Market Systems," *Proceedings of the 21st International Conference on Software Engineering (ICSE '99)*, Los Angeles, CA, May 16-22, 1999 (Refereed abstract).
90. Richard W. Selby, "Strategy and Design for Buy-Sell Listing Exchanges," *Proceedings of the United States Business Exchange Technology Workshop*, Santa Monica, CA, June 21-22, 2000.
91. Richard W. Selby, "Systems for Facilitating Financial Workflow Processes for Mergers and Acquisitions," *Proceedings of the United States Business Exchange Technology Workshop*, Santa Monica, CA, June 6-7, 2001.
92. Richard W. Selby, "Six Sigma Projects for Software Process Improvement," *Proceedings of the Northrop Grumman Summit on Process Improvement*, Redondo Beach, CA, July 9-10, 2003.

93. Richard W. Selby, "Process Improvement Strategies Using Capability Maturity Model Integration (CMMI) and Six Sigma," *Proceedings of the Northrop Grumman Summit on Process Improvement*, Fair Lakes, VA, July 22-23, 2004.
94. Richard W. Selby, "Measurement-Driven Process Improvement of Team-Based Software Testing Strategies," *Proceedings of the 10th International Symposium on Software Metrics (Metrics 2004)*, Chicago, IL, September 14-16, 2004.
95. Richard W. Selby, "Measurement-Driven Prediction of High Error and High Effort Software Components in Large-Scale Systems," *Proceedings of the AIAA Space 2004 Conference*, San Diego, CA, September 28-30, 2004.
96. Richard W. Selby, "Team Testing Strategies for Error Detection in Software Components," *Proceedings of the AIAA Space 2004 Conference*, San Diego, CA, September 28-30, 2004.
97. Richard W. Selby, "Software Requirements Metrics Provide Leading Indicators in Measurement-Driven Dashboards for Large-Scale Systems," *Proceedings of the 19th International Forum on COCOMO and Software Cost Modeling*, Los Angeles, CA, October 26-29, 2004.
98. Richard W. Selby, "Evaluating Error-Proneness of Software Reuse in Large-Scale Systems," *Proceedings of the 43rd AIAA Aerospace Sciences Conference*, Reno, NV, January 10-13, 2005.
99. Richard W. Selby, "Software Reuse in Large-Scale Systems," *Proceedings of the AIAA Space 2005 Conference*, Long Beach, CA, August 30 – September 1, 2005.
100. Richard W. Selby, "Event-Driven Software Architectures for Large-Scale Systems," *Proceedings of the AIAA Space 2005 Conference*, Long Beach, CA, August 30 – September 1, 2005.
101. Richard W. Selby, "Measurement-Driven Dashboards Enable Leading Indicators for Requirements and Design of Large-Scale Systems," *Proceedings of the 11th International Symposium on Software Metrics (Metrics 2005)*, Como, Italy, September 19-22, 2005 (89 papers submitted, 39 accepted; a 2:1 ratio).
102. Richard W. Selby, "Modeling Leading Indicators of Fault-Prone Designs of Large-Scale Systems," *Proceedings of the 20th International Forum on COCOMO and Software Cost Modeling*, Los Angeles, CA, October 25-28, 2005.
103. Richard W. Selby, "Generating State- and Interaction-Based Models for Analyzing Software Architectures," *Proceedings of the 4th International Symposium on Empirical Software Engineering (ISESE 2005)*, Noosa Heads, Australia, November 17-18, 2005.

104. Richard W. Selby, "Measurement-Driven Software Development Using Six Sigma Strategies and Techniques," *Proceedings of the 4th International Symposium on Empirical Software Engineering (ISESE 2005)*, Noosa Heads, Australia, November 17-18, 2005.
105. Richard W. Selby, "Architecture-Driven Modeling of Large Software Systems," *Proceedings of the 44th AIAA Aerospace Sciences Conference*, Reno, NV, January 9-12, 2006.
106. Richard W. Selby, "Integrating Measurement-Driven Development Methods into Software Engineering Training," *Proceedings of the 19th Conference on Software Engineering Education and Training (CSEET 2006)*, Turtle Bay, HI, April 19-21, 2006.
107. Richard W. Selby, "Generating Predictive Models Using Decision Trees and Neural Networks for Large-Scale Systems Engineering," *Proceedings of the 16th Annual International Symposium of the International Council on Systems Engineering (INCOSE 2006)*, Orlando, FL, July 9-13, 2006.
108. Richard W. Selby, "Enabling Measurement-Driven System Development by Analyzing Testing Strategy Tradeoffs," *Proceedings of the 16th Annual International Symposium of the International Council on Systems Engineering (INCOSE 2006)*, Orlando, FL, July 9-13, 2006.
109. Richard W. Selby and Jairus Hihn, "Enabling Early Lifecycle Predictive Models of Software Systems," *Proceedings of the AIAA Space 2006 Conference*, San Jose, CA, September 19-21, 2006.
110. Richard W. Selby, "Software Engineering: The Legacy of Barry W. Boehm," *Proceedings of the 29th International Conference on Software Engineering (ICSE 2007)*, Minneapolis, MN, May 22-25, 2007 (Symposium summary).
111. Richard W. Selby, "Enabling Measurement-Driven Software Development and Management Using Six Sigma Techniques," *Proceedings of the 19th Systems and Software Technology Conference (SSTC 2007)*, Tampa, FL, June 18-21, 2007.
112. Paige C. Selby and Richard W. Selby, "Measurement-Driven Systems Engineering Using Six Sigma Techniques to Improve Software Defect Detection," *Proceedings of the 17th International Symposium of the International Council on Systems Engineering (INCOSE 2007)*, San Diego, CA, June 24-28, 2007.
113. Richard W. Selby, "Enabling Economics-Driven Systems Engineering Through Reusable Software Architectures and Components," *Proceedings of the 17th International Symposium of the International Council on Systems Engineering (INCOSE 2007)*, San Diego, CA, June 24-28, 2007.
114. Richard W. Selby, "Bridging the Gap Between the Science and Practice of High Confidence Cyber-Physical Systems," *Proceedings of the National Science and Technology Council Workshop on New Research Directions in Composable and Systems Technologies for High Confidence Cyber-Physical Systems (CST-HCCPS)*, Arlington, VA, July 9-10, 2007.

115. Richard W. Selby, "Machine Learning Models for Predicting Attributes of Large-Scale Systems," *Proceedings of the 46th AIAA Aerospace Sciences Conference*, Reno, NV, January 7-10, 2008.
116. Richard W. Selby, "Software Development Statistical Process Control Using Six Sigma Techniques," *Proceedings of the 46th AIAA Aerospace Sciences Conference*, Reno, NV, January 7-10, 2008.
117. Richard W. Selby, "Analyzing Testing Strategy Tradeoffs to Improve Systems Engineering Effectiveness and Efficiency," *Proceedings of the 46th AIAA Aerospace Sciences Conference*, Reno, NV, January 7-10, 2008.
118. Richard W. Selby, "Embedding Executable Meta-Languages within Cyber-Physical Systems," *Proceedings of the National Science and Technology Council Workshop on High Confidence Automotive Cyber-Physical Systems*, Troy, MI, April 3-4, 2008.
119. Colfax L. C. Selby and Richard W. Selby, "Understanding Innovation through Leading Indicators for Requirements and Designs of Large-Scale Systems," *Proceedings of the International Forum on Knowledge Asset Dynamics (IFKAD 2008)*, Matera, Italy, June 26-27, 2008.
120. Richard W. Selby, "Software Design and Development Principles for Large-Scale Mission-Critical Embedded Systems," *Proceedings of the AIAA Space 2008 Conference*, San Diego, CA, September 9–11, 2008.
121. Richard W. Selby, "Leading Indicators for Requirements and Design of Large-Scale Systems," *Proceedings of the AIAA Space 2008 Conference*, San Diego, CA, September 9–11, 2008.
122. Richard W. Selby, "Measurement-Driven Return-on-Investment Analysis for Software Defect Prevention," *Proceedings of the AIAA Space 2008 Conference*, San Diego, CA, September 9–11, 2008.
123. Richard W. Selby, "Systems and Software Design Principles for Large-Scale Mission-Critical Embedded Products from Aerospace and Financial Problem Domains," *Proceedings of the 11th Annual National Defense Industrial Association (NDIA) Systems Engineering Conference*, San Diego, CA, October 20-23, 2008.
124. Richard W. Selby, "Development and Management of Large-Scale Mission-Critical Embedded Software Systems for Robotic Spacecraft," *Proceedings of the 47th AIAA Aerospace Sciences Conference*, Orlando, FL, January 5-8, 2009.
125. Richard W. Selby, "Enabling Economics-Driven System Development through Return-on-Investment Analysis of Software Defect Prevention," *Proceedings of the 47th AIAA Aerospace Sciences Conference*, Orlando, FL, January 5-8, 2009.

126. Richard W. Selby, "Interactive Models for Display, Drilldown, and Decision-Making on Large-Scale Systems," *Proceedings of the 21st Systems and Software Technology Conference (SSTC 2009)*, Salt Lake City, UT, April 20-23, 2009.
127. Richard W. Selby, "Synthesis, Analysis, and Modeling of Large-Scale Mission-Critical Embedded Software Systems," *Proceedings of the International Conference on Software Process (ICSP 2009)*, Vancouver, Canada, May 16-17, 2009.
128. Richard W. Selby, "Statistical Process Control for System Development Using Six Sigma Techniques," *Proceedings of the AIAA Space 2009 Conference*, Pasadena, CA, September 14-17, 2009.
129. Richard W. Selby, "Synchronize and Stabilize Lifecycle Model for Large-Scale Software Systems," *Proceedings of the 48th AIAA Aerospace Sciences Conference*, Orlando, FL, January 4-7, 2010.

Non-Refereed Publications

130. Richard W. Selby, "Evaluations of Software Technologies: Testing, Cleanroom, and Metrics," Dept. of Computer Science, Univ. Maryland, College Park, MD, Ph. D. Dissertation, Technical Report TR-1500, May 1985.
131. Richard W. Selby, "Software Reliability Measurement: Observations of Failure Data," Federal Systems Division, IBM Corporation, Bethesda, MD, Technical Report, June 1985.
132. Richard W. Selby, "Measuring and Evaluating Software Environments," Dept. of Information and Computer Science, University of California, Irvine, Technical Report TR-87-14, May 1987.
133. Richard W. Selby, Greg James, Kent Madsen, Joan Mahoney, Adam Porter and Doug Schmidt, "Amadeus: An Automated Measurement and Empirical Analysis System -- Conceptual Architecture Overview," Arcadia Project, University of California, Irvine, Technical report UCI-89-21, June 1989.
134. Aaron Goldstein, Hal Hart, and Richard W. Selby, "Amadeus System Enables Automated Software Measurement and Analysis," *Software Technology for Adaptable Reliable Systems (STARS) Newsletter*, Vol. III, No. 2, September 1992, pp. 11-12.
135. Michael A. Cusumano and Richard W. Selby, "Making Large Teams Work Like Small Teams: Microsoft's Synch-and-Stabilize Process for Software Product Development," M.I.T. International Center for Research on the Management of Technology (ICRMOT), Technical report 127-95, August 1995.

136. Michael A. Cusumano and Richard W. Selby, "Microsoft's Competitive Principles: Pioneer and Orchestrate Evolving Mass Markets," M.I.T. International Center for Research on the Management of Technology (ICRMOT), Technical report 129-95, August 1995.
137. Michael A. Cusumano and Richard W. Selby, "What? Microsoft weak?," *Computerworld*, Vol. 29, No. 40, October 2, 1995, pp. 105-107.

Media Appearances: Television, Radio, and Print

1. Reviewed in *Publishers Weekly*, Vol. 242, No. 37, September 11, 1995, p. 69.
2. Reviewed in *Booklist*, September 15, 1995.
3. Interviewed for *Reuters News Service* by Dick Satrin, New York, NY, September 18, 1995.
4. Reviewed in *PC Week* by Dan Farber, Vol. 12, No. 37, September 18, 1995, p. 146.
5. Reviewed in the *Library Journal* by J. P. Miller, Vol. 120, No. 16, October 1, 1995, p. 92.
6. Interviewed for *Orange County Register* by Elisa Williams, Irvine, CA, October 5, 1995.
7. Interviewed on *KWHY* television by Mike Russell (5 minutes - regional), Los Angeles, CA, October 6, 1995.
8. Interviewed on *KIEV* radio by Steve Knight (30 minutes - regional), Los Angeles, CA, October 6, 1995.
9. Interviewed on *KCTS (PBS)* television by Barry Mitzman (10 minutes - regional), Seattle, WA, October 10, 1995.
10. Interviewed for the *Tacoma News Tribune* by Cynthia Flash, Tacoma, WA, October 10, 1995.
11. Interviewed for the *Seattle Times* by Paul Andrews, Seattle, WA, October 10, 1995.
12. Interviewed on *KIRO* radio by Dave Ross (30 minutes - regional), Seattle, WA, October 11, 1995.
13. Interviewed on *KIRO* television by Emily Lenzer (5 minutes - regional), Seattle, WA, October 11, 1995.
14. Interviewed on *KING (NBC)* television by Jim Compton (15 minutes - regional), Seattle, WA, October 12, 1995.
15. Interviewed on *CNBC* television by Ron Insana (10 minutes - national), Seattle, WA, October 12, 1995.

16. Interviewed on *KQED* radio for “Technology Nation” by Dr. Moira Gunn (30 minutes – syndicated into 50 markets nationally and another 40 markets internationally), San Francisco, CA, October 13, 1995.
17. Interviewed on *KPIX* radio by Brian Cooley (30 minutes - regional), San Francisco, CA, October 13, 1995.
18. Interviewed on *Business Radio Network* by Mike Madsen (30 minutes - syndicated), Colorado Springs, CO, October 18, 1995.
19. Interviewed on *KLOU-AM (CBS)* radio by Charles Brennan (25 minutes - regional), St. Louis, MO, October 18, 1995.
20. Reviewed in *Computerworld* by Michael Schrage, Vol. 29, No. 43, October 23, 1995, p. 37.
21. Interviewed on *WBVP-AM (NBC)* radio by Steve Kalb (60 minutes - regional), Pittsburgh, PA, October 26, 1995.
22. Interviewed on *KERN-AM (NBC)* radio by David Couch (40 minutes - regional), Los Angeles, CA, October 28, 1995.
23. Reviewed in the *San Francisco Chronicle* by Michael Stern, October 29, 1995.
24. Interviewed on *Channel America* television by Connie Martinson (20 minutes - syndicated into multiple regional markets), Los Angeles, CA, October 30, 1995.
25. Interviewed on *KPCC (National Public Radio)* by Larry Mantle (30 minutes - regional), Pasadena, CA, October 30, 1995.
26. Interviewed on *KSTC-AM (ABC)* radio by Dave Garritsen (30 minutes - regional), Denver, CO, October 31, 1995.
27. Reviewed in the *Economist*, Vol. 337, No. 7940, November 11, 1995, p. S5.
28. Interviewed for the *Los Angeles Times* by Greg Miller, Los Angeles, CA, November 20, 1995.
29. Interviewed on *Success Radio Network* by Lisa Ferrari (30 minutes - syndicated into over 100 national and international markets), New York, NY, November 27, 1995.
30. Reviewed in *Business Week*, November 27, 1995, p. 20.
31. Interviewed for the *Australian Financial Review* by Charles Wright, Sydney, Australia, November 28, 1995.
32. Interviewed on *KCEO-AM (MBS)* radio by Sarah Norton (20 minutes - regional), San Diego, CA, November 30, 1995.

33. Reviewed in the *Washington Times* by Leslie Alan Horvitz, December 3, 1995, p. B7.
34. Interviewed on *WJIL* radio by David Renfro (20 minutes - local), Jacksonville, IL, December 5, 1995.
35. Interviewed on *WHO-AM (CBS)* radio by Jan Mickelsen (60 minutes - regional), Des Moines, IA, December 5, 1995.
36. Reviewed in the *Washington Post* BookWorld section by James Fallows, December 10, 1995, p. 9.
37. Reviewed in the *Wall Street Journal* by Stanley W. Angrist, No. 247, December 12, 1995, pp. A16, A18.
38. Interviewed by *Bloomberg News Service* (10 minutes - syndicated into national and international markets), New York, NY, December 14, 1995.
39. Reviewed in the *Christian Science Monitor* by Mark Trumbull, Vol. 88, No. 24, December 28, 1995, p. 8.
40. Interviewed for *USA Today* by Ellen Newborn, Irvine, California, January 24, 1996.
41. Interviewed on *KUCI* radio by Jim Whitehead (20 minutes - local), Irvine, CA, February 29, 1996.
42. Reviewed in *The New York Review of Books* by James Fallows, Vol. 43, No. 3, 1996, p. 14.
43. Reviewed in *Choice* by R. T. Firtko, Vol. 33, No. 7, March 1996, p. 1179.
44. Reviewed in *CrossTalk* by Lt. Col. Mike Taint, Vol. 9, No. 4, April 1996, p. 30.
45. Reviewed in *Chief Executive* by David Buerger, April 1996, p. 71.
46. Reviewed in *IEEE Software* by Ron Nusenoff, Vol. 13, No. 3, May 1996, pp. 107-109.
47. Reviewed in *The Times Literary Supplement* by Christopher Hitchens, No. 4858, May 10, 1996, p. 10.
48. Reviewed in *The Times* (London, U.K.) by John Naughton, August 10, 1996.
49. Reviewed in *The Red Herring* by Mark Williams, September 1996, pp. 147-148.

Invited Keynote Presentations at Professional Meetings

1. Measurement-Driven Analysis and Feedback Processes, Fourth Quality Week Conference, San Francisco, CA, May 14-17, 1991.
2. Software Measurement Frameworks, Infrastructure, and Mechanisms, Experimental Software Engineering Conference, Dagstuhl, Germany, September 14-18, 1992.
3. Empirical Analysis of Failures in Software Systems, Software Reliability Conference, Nara, Japan, November 5-6, 1992.
4. Strategic Plan for a National Software Metric Database, Software Quality Conference (Cooperstown II), Alexandria Bay, NY, August 14-17, 1994.
5. Future Directions for Software Development, Digital Equipment Corporation Windows NT Wizards Conference, Seattle, WA, March 4-6, 1996.
6. Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People, Litton Software Technology Management Conference, Santa Barbara, CA, March 5-7, 1996.
7. Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People, Software Technology Conference, Salt Lake City, UT, April 22-26, 1996 (3100 attendees).
8. Using Software Measurement for Systematic Improvement, Software Engineering Process Group (SEPG) National Conference, San Jose, CA, March 17-20, 1997.
9. Data Collection, Analysis, and Sharing Strategies for Enabling Software Measurement and Model Building, Empirical Software Engineering Conference, Dagstuhl, Germany, June 26-30, 2006.
10. Development, Management, and Economics of Large-Scale Software Systems, 20th Brazilian Symposium on Software Engineering, Florianopolis, Brazil, October 18-20, 2006.
11. Synthesis, Analysis, and Modeling of Large-Scale Mission-Critical Embedded Software Systems, International Conference on Software Process (ICSP 2009), Vancouver, Canada, May 16-17, 2009.
12. Software Innovation Opportunities for Large-Scale Mission-Critical Embedded Systems, Rolls-Royce Global Software Forum, Nottingham, United Kingdom, September 26-29, 2011.
13. Development, Management, and Economics of Large-Scale Mission-Critical Systems, 26th IEEE Software Technology Conference (STC), Long Beach, CA, March 29 - April 3, 2014.

Invited Presentations at Professional Meetings

14. The Cleanroom Approach to Developing Reliable Software, Software Psychology Society, Washington, D.C., February 10, 1984.
15. Software Engineering, Fifteenth Annual Virginia Computer Users Conference, Blacksburg, VA, May 3-4, 1985.
16. Four Applications of a Software Data Collection and Analysis Methodology, NATO Advanced Study Institute, Durham, U.K., July 29 - August 10, 1985.
17. Evaluating the Effectiveness of Software Testing Strategies, Orange County ACM Chapter meeting, Jolly Roger Hotel, Anaheim, CA, March 10, 1987.
18. A Laboratory for Software Research, Los Angeles ACM SIGSOFT Chapter meeting, Xerox Corporation, El Segundo, CA, June 1, 1987.
19. Evaluation Technologies, panel member, SDIO Software Workshop, Institute for Defense Analyses, Alexandria, VA, September 15-16, 1988.
20. Scalable Techniques for Modeling Software Interconnectivity, 22nd Symposium on the Interface: Computing Science and Statistics (Interface '90), East Lansing, MI, May 17-19, 1990.
21. Process Metrics, panel member, Software Measurement Workshop, Rome Air Development Center, Rochester, NY, May 22-24, 1990 (Invitational workshop).
22. Software Engineering Education, panel member, Thirteenth Minnowbrook Software Engineering Workshop, Blue Mountain Lake, NY, July 24-27, 1990.
23. Measurement and User Interfaces in the Arcadia Environment, ACM SIGAda Conference, Redondo Beach, CA, August 20-24, 1990.
24. Systematic Quality Improvement Using Metric-Driven Analysis Techniques and Feedback Systems, Third International Workshop on Software Quality Improvement, Tokyo, Japan, January 21-26, 1991.
25. Measurement-Driven Analysis and Feedback Systems, International Symposium on Future Software Environments, Hikone, Japan, June 13-14, 1991.
26. Measurement Principles, Techniques, and Systems for Achieving Empirically Guided Software Development and Evolution, Third Annual Software Quality Workshop, Alexandria Bay, NY, August 12-15, 1991.
27. Experimental Computer Science, panel member, Workshop on Research in Experimental Computer Science, Palo Alto, CA, October 16-18, 1991.

28. Amadeus Measurement System, STARS Joint Advisory Committee (JAC) meeting, Rosslyn, VA, August 18, 1992.
29. Transition of Measurement Technology for Software Process Improvement, Software Technology for Adaptable, Reliable Systems Conference (STARS 92), Washington, D.C., December 7-9, 1992.
30. Automated Software Measurement, Software Technology for Adaptable, Reliable Systems (STARS) Process Technology Transition Affiliates Meeting, Washington, D.C., May 17, 1993.
31. Software Measurement Infrastructure, Software Environments Workshop, Los Angeles, CA, February 14-16, 1994.
32. Software Measurement Infrastructure, Domain-Specific Software Architecture Workshop, Seattle, WA, August 3-4, 1994.
33. Software Measurement Infrastructure, Software Architecture Technologies Workshop, Institute for Defense Analyses, Washington, D.C., September 13, 1994.
34. Automated Software Measurement, Half-day tutorial, International Workshop on Software Cost Estimation, University of Southern California, Los Angeles, CA, October 5-7, 1994.
35. Future Trends in Software Measurement, Executive Workshop on Software Measurement, University of Southern California, Los Angeles, CA, March 8, 1995.
36. Software Measurement Infrastructure, DARPA Software Process Workshop, Software Productivity Consortium, Herndon, VA, May 31 - June 2, 1995.
37. Overview of Microsoft Software Development, IBM PC User's Group, Mission Viejo, CA, November 21, 1995.
38. Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People, Software Process Improvement Network (SPIN), University of Southern California, Los Angeles, CA, November 29, 1995.
39. Should You Develop Software Using the Same Techniques that Microsoft Uses?, Software Process Improvement Network (SPIN), University of California, Irvine, CA, December 1, 1995.
40. Software Development at Microsoft, Orange County Venture Group, Costa Mesa, CA, February 20, 1996.
41. Lessons Learned from Microsoft Software Development Practices, Conference for Federal Government Computing Managers, Brookings Institute, Biltmore Hotel, Los Angeles, CA, March 25, 1996.

42. Architecture Evaluation, DARPA Evolutionary Design of Complex Software (EDCS) Workshop, Lake Placid, NY, July 17-19, 1996.
43. State-of-the-Art and State-of-the-Practice Software Development Methods, CSC Index Summit for Industry Leaders, Boston, MA, September 10, 1996.
44. Architecture-Based Measurement and Analysis Tools, DARPA Evolutionary Design of Complex Software (EDCS) Workshop, Napa, CA, October 23-25, 1996.
45. Rapidly Developing Feature-Rich Applications in a Structured Environment, Institutional Investor Conference on Financial Technology, New York, NY, January 26-30, 1998.
46. Software Engineering Processes and Environments for Financial Market Systems, 21st International Conference on Software Engineering (ICSE'99), Los Angeles, CA, May 16-22, 1999.
47. Value of Empirical Research, 12th International Software Engineering Research Network (ISERN), Redondo Beach, CA, August 17, 2004.
48. Spacecraft Flight Software, Northrop Grumman Space Technology Forum, Redondo Beach, CA, October 13, 2004.
49. Flight Software Architecture and Development Approach for the Prometheus Spacecraft and the Jupiter Icy Moons Orbiter, JPL Prometheus Program Workshop, Pasadena, CA, October 27, 2004.
50. Capability Maturity Model Integration (CMMI) Enables Process-Driven Excellence, NASA Goddard Space Flight Center Quality Symposium and Contractor Awards, Greenbelt, MD, May 3, 2005.
51. Flight Software Development Approach for the Prometheus Spacecraft to Jupiter, Hamilton Sundstrand Prometheus Program Workshop, Rockford, IL, May 10, 2005.
52. Strategies, Architectures, and Techniques for Developing Large-Scale, Mission-Critical Embedded Software Systems, MIT Workshop on Critical Research Areas in Aerospace Software, Cambridge, MA, August 9, 2005.
53. Development of the Next Generation of Assured Real-Time Software Systems, NSF Workshop on High Confidence Software and Systems, Arlington, VA, September 7, 2005.
54. Value-Based Software Engineering, 13th International Software Engineering Research Network (ISERN), Noosa Heads, Australia, November 14-15, 2005.

55. Systems and Software Engineering Acquisition Strategies, Executive Workshop on Systems and Software Engineering, University of Southern California, Los Angeles, CA, March 15, 2006.
56. Industrial Impact through Education – Lessons Learned from Barry Boehm's Contribution to Software Engineering, 19th Conference on Software Engineering Education and Training (CSEET 2006), Turtle Bay, HI, April 19-21, 2006.
57. Best Practices for Empirical Research with Industry, panel member, 14th International Software Engineering Research Network (ISERN), Rio de Janeiro, Brazil, September 18-19, 2006.
58. Strategies for Measurement-Driven System Modeling and Analysis, 20th Brazilian Symposium on Software Engineering, Florianopolis, Brazil, October 18-20, 2006.
59. Systems of Systems Acquisition and Management Critical Success Factors, Convocation of the Center for Systems and Software Engineering, University of Southern California, Los Angeles, CA, October 23-26, 2006.
60. Advancing Software-Intensive Systems Producibility: Uncertainty at Scale, Computer Science and Telecommunications Board, The National Academies, Washington DC, January 17, 2007.
61. Process Synchronization and Stabilization, Executive Workshop on Systems and Software Engineering, University of Southern California, Los Angeles, CA, February 12-15, 2007.
62. Introduction to Software Economics, Symposium on Software Engineering: The Legacy of Barry W. Boehm, co-located event in conjunction with the 29th International Conference on Software Engineering (ICSE 2007), Minneapolis, MN, May 22, 2007.
63. Software Risk and Estimation Trends, Opportunities, and Recommendations, Department of Defense Software in Acquisition Workshop, Arlington, VA, October 16-17, 2007.
64. Sizing Methods, Techniques, and Experiences, panel moderator, 22nd International Forum on Systems, Software, and COCOMO Cost Modeling, University of Southern California, Los Angeles, CA, October 30 – November 1, 2007.
65. Extensible Software Product Line Architectures for Enabling Software Reuse and High Reliability in Net-Centric Systems, Northrop Grumman Conference on Net-Centric Systems, Redondo Beach, CA, January 15-17, 2008.
66. Integration of Commercial-off-the-Shelf (COTS) Networking Software into Space-Based Platforms, Northrop Grumman Conference on Net-Centric Systems, Redondo Beach, CA, January 15-17, 2008.

67. High-Confidence Cyber-Physical Systems Challenges and Opportunities, panel member, National Science and Technology Council Workshop on High Confidence Automotive Cyber-Physical Systems, Troy, MI, April 3-4, 2008.
68. Software Risk and Estimation High-Payoff Initiatives and Recommendations, Department of Defense Software in Acquisition Workshop, Alexandria, VA, April 15-16, 2008.
69. Systems/Software Acquisition and Process Issues and Recommendations, Systems/Software Incremental Commitment Model (ICM) Workshop, Washington, DC, July 14-17, 2008.
70. Systems/Software Acquisition and Process Initiative Recommendations, Software in Acquisition Roundtable, 11th Annual National Defense Industrial Association (NDIA) Systems Engineering Conference, San Diego, CA, October 20-23, 2008.
71. Future Trends in Estimation for Next-Generation Processes, panel moderator, 23rd International Forum on Systems, Software, and COCOMO Cost Modeling, University of Southern California, Los Angeles, CA, October 28-30, 2008.
72. Future Trends in Systems and Software Effort/Schedule/Risk/Quality Modeling, panel moderator, 24th International Forum on Systems, Software, and COCOMO Cost Modeling, Massachusetts Institute of Technology, Cambridge, MA, November 2-5, 2009.

Invited Colloquia Presentations

73. Parameter Estimation for Linear Combinations of Exponential Functions, Honeywell Corporate Technology Center, Minneapolis, MN, January 1981.
74. Parameter Estimation for Linear Combinations of Exponential Functions, Department of Mathematics, St. Olaf College, Northfield, MN, April 1981.
75. An Analysis of the Cleanroom Software Development Method, IBM, Federal Systems Division, Bethesda, MD, May 16, 1983.
76. A Controlled Study to Evaluate Software Testing Techniques: Study Proposal and Testing Technique Tutorial, Computer Sciences Corporation, Silver Spring, MD, October 1984.
77. Comparisons of the Effectiveness of Software Testing Strategies, Computer Sciences Corporation, Silver Spring, MD, November 16, 1984.
78. Empirical Evaluations of Software Technologies: Testing, Cleanroom, and Metrics, University of Illinois, Champaign-Urbana, IL, March 1985.
79. Empirical Evaluations of Software Technologies: Testing, Cleanroom, and Metrics, New York University, New York, NY, March 1985.

80. Empirical Evaluations of Software Technologies: Testing, Cleanroom, and Metrics, University of California, Irvine, CA, March 1985.
81. Empirical Evaluations of Software Technologies: Testing, Cleanroom, and Metrics, Georgia Institute of Technology, Atlanta, GA, March 1985.
82. Empirical Evaluations of Software Technologies: Testing, Cleanroom, and Metrics, Cornell University, Ithaca, NY, April 1985.
83. Empirical Evaluations of Software Technologies: Testing, Cleanroom, and Metrics, UCLA, Los Angeles, CA, April 1985.
84. Empirical Evaluations of Software Technologies: Testing, Cleanroom, and Metrics, University of Southern California, Los Angeles, CA, April 1985.
85. Empirical Evaluations of Software Technologies: Testing, Cleanroom, and Metrics, Microelectronics and Computer Technology Corporation, Austin, TX, April 1985.
86. Structured Technologies in Software Testing, tutorial, Seville Hotel, Minneapolis, MN, September 10-12, 1985.
87. Structured Technologies in Software Testing, tutorial, Los Angeles Airport Hilton, Los Angeles, CA, September 18-20, 1985.
88. Empirical Evaluation of Software Technologies, Second Annual Irvine Computer Science Symposium, University of California, Irvine, CA, September 19, 1985.
89. Characterizing Software Error Data, IBM, Data Systems Division, Kingston, NY, October 29, 1985.
90. Measurement and Evaluation in the Arcadia Software Environment Architecture, Software Engineering Institute, Carnegie-Mellon University, Pittsburgh, PA, April 3, 1986.
91. A Laboratory for Software Technology Evaluation, Sun Microsystems, Mountain View, CA, June 18, 1986.
92. The Use and Interpretation of Software Data Bindings Analysis, IBM, Data Systems Division, Kingston, NY, June 26, 1986.
93. Application of a Data Collection and Analysis Methodology in an IBM Environment, IBM, Data Systems Division, Kingston, NY, June 26, 1986.
94. Structured Technologies for Software Development, tutorial, Hyatt Regency O'Hare, Chicago, IL, August 13-15, 1986.

95. Experimental Designs for the Evaluation of Network Performance, Digital Equipment Corporation, Salem, NH, September 22, 1986.
96. The Arcadia Software Environment, Alsys Corporation, Waltham, MA, September 23, 1986.
97. Structured Technologies in Software Testing, tutorial, St. Paul Companies, St. Paul, MN, February 23-25, 1987.
98. Evaluating the Effectiveness of Software Testing Strategies, Jet Propulsion Laboratory, Pasadena, CA, July 10, 1987.
99. Software Engineering, Northrop Corporation Information Resource Management Conference, Radisson Plaza Hotel, Manhattan Beach, CA, October 7, 1987.
100. Developing and Evaluating Software Technologies, Booz-Allen & Hamilton, Vienna, VA, November 2, 1987.
101. Evaluation of Software Testing Methods, Hughes Aircraft Co., Westchester, CA, February 16, 1988.
102. Identifying Error-Prone and Costly Software Modules, Hughes Aircraft Co., Ground Systems Group, Fullerton, CA, June 3, 1988.
103. Structured Technologies in Software Testing, tutorial, Blue Cross, Pittsburgh, PA, June 6-10, 1988.
104. Structured Technologies in Software Testing, tutorial, Blue Cross, Pittsburgh, PA, June 13-16, 1988.
105. Statistical Data Analysis, tutorial, U.S. Army base, Picatinny Arsenal, NJ, July 11-13, 1988.
106. Identifying Error-Prone and Costly Software Modules, Embedded Software Task Force meeting, Northrop Corp., Anaheim, CA, August 17, 1988.
107. Identifying Error-Prone and Costly Software Modules, TRW, Defense Systems Group, Redondo Beach, CA, September 21, 1988.
108. Software Measurement and Evaluation, TRW, Defense Systems Group, Carson, CA, October 17, 1988.
109. Software Data Bindings Metrics and Classification Tree Integration Frameworks, Wang Laboratories, Lowell, MA, January 18, 1989.
110. Error Localization During Software Integration, Hughes Aircraft Co., Westchester, CA, February 21, 1989.

111. Empirically Based Analysis Techniques for Large-Scale Software, Hughes Aircraft Co., Ground Systems Group, Fullerton, CA, June 12, 1989.
112. Metric-Based Classification Trees for Identifying High-Risk Software Components, Wang Laboratories, Lowell, MA, July 31, 1989.
113. Structured Technologies in Software Testing, tutorial, Mayflower Corporation, Indianapolis, IN, September 18-20, 1989.
114. The Amadeus Measurement and Empirical Analysis System, Software Technology Program, Microelectronics and Computer Technology Corporation (MCC), Austin, TX, October 6, 1989.
115. Empirically Guided Software Development, University of Dortmund, Dortmund, West Germany, March 22, 1990.
116. Structured Technologies in Software Testing, tutorial, United American Life Insurance, Indianapolis, IN, August 6-8, 1990.
117. Amadeus Measurement and Empirical Analysis System, Sun Microsystems, Mountain View, CA, August 17, 1990.
118. Metric-Driven Analysis and Feedback Systems, Process Technical Roundtable, Irvine Research Unit in Software (IRUS), Irvine, CA, October 26, 1990.
119. Metric-Driven Analysis and Feedback Systems, Department of Computer Science, Ohio State University, Columbus, OH, December 12, 1990.
120. Amadeus Measurement-Driven Analysis and Feedback System, Inaugural Convocation, Irvine Research Unit in Software (IRUS), Irvine, CA, January 18, 1991.
121. Event-Based Control Mechanisms for Tool Integration, Bay Area Technical Roundtable, Irvine Research Unit in Software (IRUS), Palo Alto, CA, April 6, 1991.
122. Comparative Studies of Software Development Using Ada, Northrop Corporation, Hawthorne, CA, April 24, 1991.
123. Measurement-Driven Analysis and Feedback Systems, Nippon Steel Research and Development Laboratory, Tokyo, Japan, June 10, 1991.
124. Measurement-Driven Analysis and Feedback Systems, Tokyo Institute of Technology, Tokyo, Japan, June 11, 1991.
125. Measurement-Driven Analysis and Feedback Systems, Osaka University, Osaka, Japan, June 20, 1991.

126. Measurement-Driven Analysis and Feedback Systems, University of Hong Kong, Hong Kong, June 24, 1991.
127. Amadeus Measurement-Driven Analysis and Feedback System, Paramax Corporation, Reston, VA, August 8-9, 1991.
128. Amadeus Component Descriptions and Abstract Interfaces, Paramax Corporation, Reston, VA, October 10, 1991.
129. Measurement-Driven Analysis and Feedback Systems, Politecnico d' Milano, Milan, Italy, October 21, 1991.
130. Software Metrics: The Good, the Bad, and the Ugly, IBM, FSC, Owego, NY, November 4, 1991.
131. Integrating with the Amadeus Measurement-Driven Analysis and Feedback System, STARS PJAG meeting, Redondo Beach, CA, February 6, 1992.
132. Software Measurement, Experimentation, and Data Analysis, one-day tutorial, IBM, FSC, Owego, NY, April 13-14, 1992.
133. Software Metrics Overview, Software Process Improvement Network (SPIN), Irvine Research Unit in Software (IRUS), Irvine, CA, April 24, 1992.
134. Measurement-Driven Analysis and Feedback Systems, Mitre Corporation, Vienna, VA, August 12-13, 1992.
135. Measurement-Driven Analysis and Feedback Systems, NTT, Tokyo, Japan, December 15, 1992.
136. Measurement-Driven Analysis and Feedback Systems, Software Productivity Consortium, Washington, D.C., January 20, 1993.
137. Measurement-Driven Analysis and Feedback Systems, TRW, Redondo Beach, CA, February 9-10, 1993.
138. Measurement-Driven Analysis and Feedback Systems, Paramax Systems Corporation, Reston, VA, February 18, 1993.
139. Measurement-Driven Analysis and Feedback Systems, Hewlett-Packard, Fort Collins, CO, March 22, 1993.
140. Software Quality Measurement, Analysis, and Improvement, MIT, Sloan School of Management, Cambridge, MA, April 1, 1993.

141. Measurement-Driven Analysis and Feedback Systems, University of Maryland, College Park, MD, April 5, 1993.
142. Software Metrics, Software Symposium, Irvine Research Unit in Software (IRUS), Irvine, CA, October 29, 1993.
143. Software Quality Prediction, Bay Area Technical Roundtable, Irvine Research Unit in Software (IRUS), Palo Alto, CA, November 12, 1993.
144. Measurement-Driven Analysis and Feedback Systems, Metrics Working Group, Irvine Research Unit in Software (IRUS), McDonnell Douglas Corporation, Huntington Beach, CA, March 11, 1994.
145. Data Collection and Analysis for COCOMO 2.0 Cost Estimation, University of Southern California, Los Angeles, CA, July 26-28, 1994.
146. Transition of Software Measurement Technology, DARPA, Arlington, VA, September 12, 1994.
147. Automated Measurement Techniques, Metrics Working Group, Irvine Research Unit in Software (IRUS), Irvine, CA, September 16, 1994.
148. Critique of Microsoft Software Development Methods, Microsoft retreat for senior technical managers and developers, Seattle, WA, January 26, 1995.
149. COCOMO 2.0 Cost Estimation Model, Bell Communications Research, Piscataway, NJ, March 21, 1995.
150. Systematic Improvement of Software, Retreat for Microsoft Network (MSN) Project, Seattle, WA, April 28, 1995.
151. Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People, Barnes and Noble Bookstore, Tacoma, WA, October 11, 1995.
152. Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People, Keplers Bookstore, Palo Alto, CA, October 13, 1995.
153. Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People, Borders Bookstore, Mission Viejo, CA, October 26, 1995.
154. Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People, Lockheed Martin, Owego, NY, November 2, 1995.

155. Best Practice Software Development, Lockheed Martin, Owego, NY, November 3, 1995.
156. Microsoft Software Project Management, Industry Leaders Group, National Academy of Sciences, Irvine, CA, November 28, 1995.
157. Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People, Distinguished Lecture Series, Dept. of Information and Computer Science, University of California, Irvine, CA, November 29, 1995.
158. Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People, EDS Unigraphics, Cypress, CA, January 26, 1996.
159. Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People, Distinguished Lecture Series, Newport Beach Public Library, Newport Beach, CA, April 30, 1996.
160. Software Measurement Infrastructure, Redstone Arsenal Software Engineering Directorate, Huntsville, AL, May 15, 1996.
161. Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People, Defense Advanced Research Projects Agency (DARPA), Arlington, VA, July 2, 1996.
162. Microsoft Software Development, SAIC, La Jolla, CA, July 10, 1996.
163. Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People, Dept. of Computer Science, University of California, Berkeley, CA, September 9, 1996.
164. Internet and World-Wide-Web Technology, Pacific Club, Newport Beach, CA, October 15, 1996.
165. Software Requirements Analysis, Fidelity Investments, Boston, MA, November 11, 1996.
166. Software Release Methodology, Fidelity Investments, Boston, MA, November 12, 1996.
167. Synchronize-and-Stabilize: How Microsoft Builds Software, Oracle Corporation, Redwood Shores, CA, April 24, 1997.
168. Microsoft Software Development Strategies, Pacific Investment Management Company, Newport Beach, CA, September 17, 1997.
169. Balancing Innovation and Discipline in Software Development for Financial Market Systems, Pacific Investment Management Company, Newport Beach, CA, January 14, 1998.

170. Software Architectures for Feature-Rich Applications, Pacific Investment Management Company, Newport Beach, CA, May 20, 1998.
171. Testing Strategies for the Year 2000 (Y2K) Problem, Pacific Investment Management Company, Newport Beach, CA, January 20, 1999.
172. Defect Prevention Techniques for Financial Systems in Networked Environments, Pacific Investment Management Company, Newport Beach, CA, March 10, 1999.
173. Multi-Tier Architectures for Internet-Based Exchange Systems, United States Business Exchange, Santa Monica, CA, July 12, 2000.
174. Integrating Rapid Release Management and Automated Regression Testing, United States Business Exchange, Santa Monica, CA, December 6, 2000.
175. Designing Workflow Systems for Financial Transaction Management, United States Business Exchange, Santa Monica, CA, February 16, 2001.
176. Reusable Designs and Infrastructure for Data Replication in Financial Systems, United States Business Exchange, Santa Monica, CA, June 14, 2001.
177. Root Cause Analysis of Software Defects in Spacecraft Systems, Northrop Grumman Space Technology, Redondo Beach, CA, April 26, 2002.
178. Metric-Driven Process Improvement Using CMMI and Six Sigma Techniques, Northrop Grumman Space Technology, Redondo Beach, CA, August 14, 2002.
179. Decreasing the Variability in Software Development Processes, Northrop Grumman Space Technology, Redondo Beach, CA, April 10, 2003.
180. Enabling Software Productivity Gains and Defect Reductions Through Enterprise-Wide Standard Designs, Processes, and Metrics, Northrop Grumman Space Technology, Redondo Beach, CA, May 8, 2003.
181. Enabling Large-Scale Software Development and Management Using the Synchronize-and-Stabilize Lifecycle Model, Automated Process Measurement Infrastructure, and Metric-Driven Decision Trees, University of Southern California, Los Angeles, CA, July 8, 2003.
182. Flight Software Architecture and Development Approach for the Prometheus Spacecraft and the Jupiter Icy Moons Orbiter, Northrop Grumman Space Technology, Redondo Beach, CA, November 2, 2004.
183. Software Development Strategy and Incremental Lifecycle Model for the Space Interferometry Mission, Northrop Grumman Space Technology, Redondo Beach, CA, November 3, 2004.

184. Software Organization and Process Improvement Using CMMI and Six Sigma, Jet Propulsion Laboratory, Pasadena, CA, December 6, 2004.
185. Enterprise-Wide Best Practices for Software Rework Reduction, Northrop Grumman Electronic Systems, Rolling Meadows, IL, December 6, 2005.
186. Enterprise-Wide Best Practices for Software Rework Reduction, Northrop Grumman Information Technology, McLean, VA, December 7, 2005.
187. Enterprise-Wide Best Practices for Software Rework Reduction, Northrop Grumman Electronic Systems, Baltimore, MD, December 7, 2005.
188. Enterprise-Wide Best Practices for Software Rework Reduction, Northrop Grumman Space Technology, Redondo Beach, CA, December 12, 2005.
189. Software Development Approach for NASA Crew Exploration Vehicle (CEV), NASA Johnson Space Center, Houston, TX, March 21, 2006.
190. Achieving Competitive Excellence (ACE) Best Practice Adoption for Software Development, Northrop Grumman Corporation, Century City, CA, April 26, 2006.
191. Achieving Competitive Excellence (ACE) Best Practice Adoption for Software Development, Northrop Grumman Electronic Systems, Baltimore, MD, May 3, 2006.
192. Achieving Competitive Excellence (ACE) Best Practice Adoption for Software Development, Northrop Grumman Mission Systems, Reston, VA, May 10, 2006.
193. Achieving Competitive Excellence (ACE) Best Practice Adoption for Software Development, Northrop Grumman Space Technology, Redondo Beach, CA, May 11, 2006.
194. Flight Software Development Effectiveness, Efficiency, and Improvement for NASA Crew Exploration Vehicle (CEV), NASA Johnson Space Center, Houston, TX, May 19, 2006.
195. NASA Crew Exploration Vehicle (CEV) Flight Software Architecture, NASA Johnson Space Center, Houston, TX, May 23, 2006.
196. Software Development Approach for the Air Force Advanced Extremely High Frequency (AEHF) Satellite Communications Payload System, Northrop Grumman Space Technology, Redondo Beach, CA, November 21, 2006.
197. Software Management Leading Indicators for Air Force Advanced Extremely High Frequency (AEHF) Satellite Communications Payload, Northrop Grumman Space Technology, Redondo Beach, CA, December 20, 2006.

198. Strategies, Architectures, and Techniques for Development and Management of Large-Scale Mission-Critical Embedded Software Systems, University of California, Santa Barbara, CA, April 10, 2007.
199. Software Testing Approach and Completion for the Configurable Onboard Router for the Air Force Advanced Extremely High Frequency (AEHF) Satellite Communications Payload System, Northrop Grumman Space Technology, Redondo Beach, CA, May 31, 2007.
200. Common Spacecraft Bus Architecture for Flight Software: Scope, Reuse, Effort Estimation, and Economic Benefits, Northrop Grumman Space Technology, Redondo Beach, CA, July 3, 2007.
201. Software Testing Approach and Completion for the Resource Controller for the Air Force Advanced Extremely High Frequency (AEHF) Satellite Communications Payload System, Northrop Grumman Space Technology, Redondo Beach, CA, August 30, 2007.
202. Common Spacecraft Bus Architecture for Flight Software: Technical Architecture and Components, Northrop Grumman Space Technology, Redondo Beach, CA, October 15, 2007.
203. Measurement-Driven System Development Strategies Using Empirical Analysis of Software Systems: Software Testing, Software Reuse, and Software Architecture, Institute of Software, Chinese Academy of Sciences, Beijing, China, July 21, 2009.
204. Development and Management of Large-Scale Mission-Critical Embedded Software Systems for Robotic Spacecraft, Siemens, Cypress, CA, October 2, 2013.

Presentations of Accepted Papers at Professional Meetings

205. An Empirical Study Comparing Software Testing Techniques, Sixth Minnowbrook Workshop on Software Performance Evaluation, Blue Mountain Lake, NY, July 19-22, 1983.
206. A Characteristic Software Metric Set, Seventh Minnowbrook Workshop on Software Performance Evaluation, Blue Mountain Lake, NY, July 24-27, 1984.
207. Evaluating Software Testing Strategies, Ninth Annual Software Engineering Workshop, NASA/Goddard Space Flight Center, Greenbelt, MD, November 28, 1984.
208. Calculation and Use of an Environment's Characteristic Software Metric Set, Eighth International Conference on Software Engineering, London, U.K., August 28-30, 1985.
209. Combining Software Testing Strategies: An Empirical Evaluation, ACM SIGSOFT & IEEE Computer Society Workshop on Software Testing, Banff, Canada, July 15-17, 1986.
210. The Role of Code Reading in the Software Life Cycle, Ninth Minnowbrook Workshop on Software Performance Evaluation, Blue Mountain Lake, NY, August 5-8, 1986.

211. Incorporating Metrics into a Software Environment, Joint Ada Conference: Fifth National Conference on Ada Technology and Washington Ada Symposium, Arlington, VA, March 16-19, 1987.
212. Analyzing Software Reuse at the Project and Module Design Levels, First European Software Engineering Conference, Strasbourg, France, September 9-11, 1987.
213. Automatically Generating Software Metric Decision Trees for Identifying Error-Prone and Costly Modules, Twelfth Annual Software Engineering Workshop, NASA/Goddard Space Flight Center, Greenbelt, MD, December 2, 1987.
214. Generating Hierarchical System Descriptions for Software Error Localization, ACM SIGSOFT & IEEE Computer Society Second Workshop on Software Testing, Verification, and Analysis, Banff, Canada, July 19-21, 1988.
215. Error Localization During Software Maintenance: Generating Hierarchical System Descriptions from the Source Code Alone, ACM SIGSOFT & IEEE Computer Society Conference on Software Maintenance, Phoenix, AZ, October 24-27, 1988.
216. Empirically Based Classification Trees as Metric Integration Frameworks, Twelfth Minnowbrook Workshop: Software Engineering for Parallel Computing, Blue Mountain Lake, NY, July 25-28, 1989.
217. Classification Tree Analysis Using the Amadeus Measurement and Empirical Analysis System, Fourteenth Annual Software Engineering Workshop, NASA/Goddard Space Flight Center, Greenbelt, MD, November 29, 1989.
218. Evaluating Techniques for Generating Metric-Based Classification Trees, Second Annual Oregon Workshop on Software Metrics, Portland, OR, March 19-20, 1990.
219. Modeling Software Interconnectivity, 22nd Symposium on the Interface: Computing Science and Statistics (Interface '90), East Lansing, MI, May 17-19, 1990
220. Metric-Driven Classification Models, Thirteenth Minnowbrook Software Engineering Workshop, Blue Mountain Lake, NY, July 24-27, 1990.
221. Process Measurement, Feedback, and Improvement, Third International Workshop on Software Quality Improvement, Tokyo, Japan, January 21-26, 1991.
222. Metric-Driven Analysis and Feedback Systems for Enabling Empirically Guided Software Development, Thirteenth International Conference on Software Engineering, Austin, TX, May 13-16, 1991.
223. Metric-Driven Classification Analysis, Third European Software Engineering Conference, Milan, Italy, October 22-24, 1991.

224. Measurement-Driven Analysis Techniques for Systematic Process Improvement, International Software Quality Exchange (ISQE) Conference, San Francisco, CA, March 10-11, 1992.
225. Interconnectivity Analysis Techniques for Error Localization in Large Systems, Fourth Annual Oregon Workshop on Software Metrics, Portland, OR, March 22-24, 1992.
226. Amadeus Measurement-Driven Analysis and Feedback System, DARPA Software Technology Conference, Los Angeles, CA, April 27-30, 1992.
227. Measurement-Driven Analysis and Feedback Systems, Software Technology for Adaptable, Reliable Systems Conference (STARS 92), Washington, D.C., December 7-9, 1992.
228. Automated Measurement Systems, CECOM Software Metrics Conference, Ft. Monmouth, NJ, November 17-18, 1993.
229. Example Uses of Automated Software Measurement, CECOM Software Metrics Conference, Ft. Monmouth, NJ, November 15-16, 1994.
230. Size Measurement, COCOMO 2.0 Workshop, University of Southern California, Los Angeles, CA, May 16-18, 1995.
231. Platforms for Software Execution: Databases vs. Operating Systems vs. Browsers, 19th International Conference on Software Engineering (ICSE'97), Boston, MA, May 17-23, 1997.
232. Strategy and Design for Buy-Sell Listing Exchanges, United States Business Exchange Technology Workshop, Santa Monica, CA, June 21-22, 2000.
233. Systems for Facilitating Financial Workflow Processes for Mergers and Acquisitions, United States Business Exchange Technology Workshop, Santa Monica, CA, June 6-7, 2001.
234. Six Sigma Projects for Software Process Improvement, Northrop Grumman Summit on Process Improvement, Redondo Beach, CA, July 9-10, 2003.
235. Process Improvement Strategies Using Capability Maturity Model Integration (CMMI) and Six Sigma, Northrop Grumman Summit on Process Improvement, Fair Lakes, VA, July 22-23, 2004.
236. Measurement-Driven Process Improvement of Team-Based Software Testing Strategies, 10th International Symposium on Software Metrics (Metrics 2004), Chicago, IL, September 14-16, 2004.
237. Measurement-Driven Prediction of High Error and High Effort Software Components in Large-Scale Systems, AIAA Space 2004 Conference, San Diego, CA, September 28-30, 2004.

238. Team Testing Strategies for Error Detection in Software Components, AIAA Space 2004 Conference, San Diego, CA, September 28-30, 2004.
239. Software Requirements Metrics Provide Leading Indicators in Measurement-Driven Dashboards for Large-Scale Systems, 19th International Forum on COCOMO and Software Cost Modeling, Los Angeles, CA, October 26-29, 2004.
240. Software Reuse in Large-Scale Systems, AIAA Space 2005 Conference, Long Beach, CA, August 30 – September 1, 2005.
241. Event-Driven Software Architectures for Large-Scale Systems, AIAA Space 2005 Conference, Long Beach, CA, August 30 – September 1, 2005.
242. Measurement-Driven Dashboards Enable Leading Indicators for Requirements and Design of Large-Scale Systems, 11th International Symposium on Software Metrics (Metrics 2005), Como, Italy, September 19-22, 2005.
243. Modeling Leading Indicators of Fault-Prone Designs of Large-Scale Systems, 20th International Forum on COCOMO and Software Cost Modeling, Los Angeles, CA, October 25-28, 2005.
244. Generating State- and Interaction-Based Models for Analyzing Software Architectures, 4th International Symposium on Empirical Software Engineering (ISESE 2005), Noosa Heads, Australia, November 17-18, 2005.
245. Measurement-Driven Software Development Using Six Sigma Strategies and Techniques, 4th International Symposium on Empirical Software Engineering (ISESE 2005), Noosa Heads, Australia, November 17-18, 2005.
246. Architecture-Driven Modeling of Large Software Systems, 44th AIAA Aerospace Sciences Conference, Reno, NV, January 9-12, 2006.
247. Integrating Measurement-Driven Development Methods into Software Engineering Training, 19th Conference on Software Engineering Education and Training (CSEET 2006), Turtle Bay, HI, April 19-21, 2006.
248. Generating Predictive Models Using Decision Trees and Neural Networks for Large-Scale Systems Engineering, 16th Annual International Symposium of the International Council on Systems Engineering (INCOSE 2006), Orlando, FL, July 9-13, 2006.
249. Enabling Measurement-Driven System Development by Analyzing Testing Strategy Tradeoffs, 16th Annual International Symposium of the International Council on Systems Engineering (INCOSE 2006), Orlando, FL, July 9-13, 2006.

250. Enabling Measurement-Driven Software Development and Management Using Six Sigma Techniques, 19th Systems and Software Technology Conference (SSTC 2007), Tampa, FL, June 18-21, 2007.
251. Enabling Economics-Driven Systems Engineering Through Reusable Software Architectures and Components, 17th International Symposium of the International Council on Systems Engineering (INCOSE 2007), San Diego, CA, June 24-28, 2007.
252. Bridging the Gap Between the Science and Practice of High Confidence Cyber-Physical Systems, National Science and Technology Council Workshop on New Research Directions in Composable and Systems Technologies for High Confidence Cyber-Physical Systems (CST-HCCPS), Arlington, VA, July 9-10, 2007.
253. Machine Learning Models for Predicting Attributes of Large-Scale Systems, 46th AIAA Aerospace Sciences Conference, Reno, NV, January 7-10, 2008.
254. Software Development Statistical Process Control Using Six Sigma Techniques, 46th AIAA Aerospace Sciences Conference, Reno, NV, January 7-10, 2008.
255. Analyzing Testing Strategy Tradeoffs to Improve Systems Engineering Effectiveness and Efficiency, 46th AIAA Aerospace Sciences Conference, Reno, NV, January 7-10, 2008.
256. Embedding Executable Meta-Languages within Cyber-Physical Systems, National Science and Technology Council Workshop on High Confidence Automotive Cyber-Physical Systems, Troy, MI, April 3-4, 2008.
257. Software Design and Development Principles for Large-Scale Mission-Critical Embedded Systems, AIAA Space 2008 Conference, San Diego, CA, September 9–11, 2008.
258. Leading Indicators for Requirements and Design of Large-Scale Systems, AIAA Space 2008 Conference, San Diego, CA, September 9–11, 2008.
259. Measurement-Driven Return-on-Investment Analysis for Software Defect Prevention, AIAA Space 2008 Conference, San Diego, CA, September 9–11, 2008.
260. Systems and Software Design Principles for Large-Scale Mission-Critical Embedded Products from Aerospace and Financial Problem Domains, 11th Annual National Defense Industrial Association (NDIA) Systems Engineering Conference, San Diego, CA, October 20-23, 2008.
261. Development and Management of Large-Scale Mission-Critical Embedded Software Systems for Robotic Spacecraft, 47th AIAA Aerospace Sciences Conference, Orlando, FL, January 5-8, 2009.

262. Enabling Economics-Driven System Development through Return-on-Investment Analysis of Software Defect Prevention, 47th AIAA Aerospace Sciences Conference, Orlando, FL, January 5-8, 2009.
263. Interactive Models for Display, Drilldown, and Decision-Making on Large-Scale Systems, 21st Systems and Software Technology Conference (SSTC 2009), Salt Lake City, UT, April 20-23, 2009.
264. Statistical Process Control for System Development Using Six Sigma Techniques, AIAA Space 2009 Conference, Pasadena, CA, September 14-17, 2009.
265. Synchronize and Stabilize Lifecycle Model for Large-Scale Software Systems, 48th AIAA Aerospace Sciences Conference, Orlando, FL, January 4-7, 2010.

SERVICE

Professional Community Service and Committee Activities

Editorial board member or guest editor

1. Editorial board member, *Journal of Software Testing, Verification, and Reliability*, John Wiley and Sons Ltd., Sigma Press, U.K., 1990 – 1998.
2. Editorial board member, *Software Quality Journal*, Chapman and Hall, London, 1991 – 1998.
3. Guest editor (with Koji Torii as co-editor), *IEEE Transactions on Software Engineering*, IEEE Computer Society, New York, Special issue on software measurement principles, techniques, and environments, November 1992.
4. Editorial board member, *Empirical Software Engineering*, Springer-Verlag, Berlin, 2006 – 2009.
5. Editorial board member, *IEEE Transactions on Big Data*, IEEE Computer Society, New York, 2015 – 2018.

Chair or co-chair of program committee or subcommittee

6. Co-Chair, Program committee, First Irvine Software Symposium (ISS'91), Irvine, CA, June 1991.
7. Chair, Program committee, Second Irvine Software Symposium (ISS'92), Irvine, CA, March 1992.
8. Co-Chair, Program committee, Experimental Software Engineering Conference, Dagstuhl, Germany, September 14-18, 1992.

9. Co-Chair, Demonstrations, Fifth Symposium on Software Development Environments (SDE'5), Washington, D.C., December 9-11, 1992.
10. Co-Chair, Program committee, Fourth Irvine Software Symposium (ISS'94), Irvine, CA, April 8, 1994.
11. Chair, Program committee, First California Software Symposium Tools Fair, Irvine, CA, March 31, 1995.
12. Co-Chair, Panel presentations, 19th International Conference on Software Engineering (ICSE'97), Boston, MA, May 17-23, 1997.
13. Co-Chair, Program committee, 1st NASA Workshop on Spacecraft Software System Instrumentation and Control, Pasadena, CA, December 7-9, 2004.
14. Co-Chair, Program committee, 2nd NASA Workshop on Spacecraft Software System Instrumentation and Control, Redondo Beach, CA, June 7-8, 2005.
15. Chair, Program committee, 21st International Forum on Systems, Software, and COCOMO Cost Modeling, Herndon, VA, November 7-9, 2006.
16. Chair, Program committee, Symposium on Software Engineering: The Legacy of Barry W. Boehm, co-located event in conjunction with the 29th International Conference on Software Engineering (ICSE 2007), Minneapolis, MN, May 22, 2007.
17. Chair, Program committee, 22nd International Forum on Systems, Software, and COCOMO Cost Modeling, University of Southern California, Los Angeles, CA, October 30 – November 1, 2007.
18. Co-Chair, Program committee, Northrop Grumman Conference on Net-Centric Systems, Redondo Beach, CA, January 15-17, 2008.
19. Co-Chair, Program committee, Department of Defense Software in Acquisition Workshop, Alexandria, VA, April 15-16, 2008.
20. Chair, Program committee, 23rd International Forum on Systems, Software, and COCOMO Cost Modeling, University of Southern California, Los Angeles, CA, October 28-30, 2008.
21. Chair, Program committee, Northrop Grumman Conference on Software Engineering, Redondo Beach, CA, March 2-4, 2009.
22. Co-Chair, Program committee, 3rd International Symposium on Empirical Software Engineering and Measurement (ESEM 2009), Lake Buena Vista, FL, October 15-16, 2009.

23. Chair, Program committee, 24th International Forum on Systems, Software, and COCOMO Cost Modeling, Massachusetts Institute of Technology, Cambridge, MA, November 2-5, 2009.
24. Chair, Steering committee, Northrop Grumman Conference on Software Engineering, Linthicum, MD, March 2-4, 2010.
25. Chair, Program committee, 25th International Forum on Systems, Software, and COCOMO Cost Modeling, University of Southern California, Los Angeles, CA, November 2-4, 2010.
26. Chair, Program committee, 26th International Forum on Systems, Software, and COCOMO Cost Modeling, University of Southern California, Los Angeles, CA, November 2-4, 2011.
27. Chair, Steering committee, Northrop Grumman Conference on Software Engineering, Redondo Beach, CA, March 20-22, 2012.
28. Chair, Program committee, 27th International Forum on Systems, Software, and COCOMO Cost Modeling, Software Engineering Institute, Carnegie Mellon University, Pittsburgh, PA, October 16-18, 2012.
29. Chair, Program committee, 1st International Conference on Business Analytics, Los Angeles, CA, December 7, 2012.
30. Chair, Program committee, 28th International Forum on Systems, Software, and COCOMO Cost Modeling, University of Southern California, Los Angeles, CA, October 22-24, 2013.
31. Chair, Steering committee, Northrop Grumman Conference on Software Engineering, Linthicum, MD, April 7-10, 2014.
32. Chair, Program committee, 2nd International Conference on Business Analytics, Los Angeles, CA, April 25, 2014.
33. Chair, Program committee, 29th International Forum on Systems, Software, and COCOMO Cost Modeling, University of Southern California, Los Angeles, CA, October 21-23, 2014.
34. Chair, Program committee, 3rd International Conference on Business Analytics, Los Angeles, CA, March 6, 2015.
35. Chair, Program committee, 4th International Conference on Business Analytics, Los Angeles, CA, October 23, 2015.
36. Chair, Program committee, 5th International Conference on Business Analytics, Los Angeles, CA, October 21, 2016.
37. Chair, Program committee, Northrop Grumman Conference on Systems Engineering, Redondo Beach, CA, March 7-9, 2017.

38. Chair, Program committee, 6th International Conference on Business Analytics, Los Angeles, CA, October 20, 2017.

39. Co-Chair, Program committee, 7th International Conference on Business Analytics, Los Angeles, CA, March 8, 2019.

Member of program committee

40. Program committee member, 11th International Conference on Software Engineering (ICSE'11), Pittsburgh, PA, May 1989.

41. Program committee member, Conference on Software Maintenance (CSM'89), Miami, FL, October 1989.

42. Program committee member, Thirteenth Minnowbrook Software Engineering Workshop, Blue Mountain Lake, NY, July 1990.

43. Program committee member, Conference on Software Maintenance (CSM'90), San Diego, CA, November 1990.

44. Program committee member, Third Annual Workshop on Software Metrics, Portland, OR, March 1991.

45. Program/Workshop committee member, 2nd IEEE/ACM SIGAda Symposium on Environments and Tools for Ada (SETA'2), Washington, D.C., January 1992.

46. Program committee member, Fifth Symposium on Software Development Environments (SDE'5), Washington, D.C., December 9-11, 1992.

47. Program committee member, Third Irvine Software Symposium (ISS'93), Irvine, CA, March 1993.

48. Program committee member, International Software Metrics Symposium (Metrics'93), Baltimore, MD, May 21-22, 1993.

49. Program committee member, Fifth California Software Symposium (CSS'95), Irvine, CA, March 30, 1995.

50. Program committee member, International Software Metrics Symposium (Metrics'96), Berlin, Germany, March 25-26, 1996.

51. Program committee member, Sixth California Software Symposium (CSS'96), Los Angeles, CA, April 17, 1996.

52. Program committee member, 1st International Symposium on Empirical Software Engineering and Measurement (ESEM 2007), Madrid, Spain, September 20-21, 2007.

53. Program committee member, Department of Defense Software in Acquisition Workshop, Arlington, VA, October 16-17, 2007.
54. Program committee member, 2nd International Symposium on Empirical Software Engineering and Measurement (ESEM 2008), Kaiserslautern, Germany, October 9-10, 2008.
55. Program committee member, International Conference on Software Process (ICSP 2010), Paderborn, Germany, July 8-9, 2010.
56. Program committee member, International Conference on Software and Systems Process (ICSSP 2011), Honolulu, HI, May 21-22, 2011.
57. Program committee member, International Conference on Software and Systems Process (ICSSP 2012), Zurich, Switzerland, June 2-3, 2012.
58. Program committee member, 3rd International Conference on the Software Business, Massachusetts Institute of Technology, Cambridge, MA, June 18-20, 2012.
59. Program committee member, International Conference on Software and Systems Process (ICSSP 2013), San Francisco, CA, May 18-19, 2013.
60. Publicity committee member, International Conference on Software Engineering (ICSE), San Francisco, CA, May 18-26, 2013.
61. Program committee member, International Conference on Software and Systems Process (ICSSP 2014), Nanjing, Jiangsu, China, May 26-28, 2014.

Chair of session or working group

62. Session chair, Software Metrics, ACM SIGSOFT & IEEE Computer Society Conference on Software Maintenance, Miami, FL, October 16-19, 1989.
63. Working group chair, Process Analysis, National Science Foundation, Software Artifact Research Initiative Workshop, Atlanta, GA, January 23-24, 1990.
64. Working group chair, Process Measurement, Feedback, and Improvement, Third International Workshop on Software Quality Improvement, Tokyo, Japan, January 21-26, 1991.
65. Session chair, Software Quality Conference (Cooperstown II), Alexandria Bay, NY, August 14-17, 1994.
66. Working group chair, Software Size Measurement, COCOMO 2.0 Workshop, University of Southern California, Los Angeles, CA, May 16-18, 1995.

67. Working group chair, Software Measurement, Monitoring, and Prediction, DARPA Software Environments Workshop, Boulder, CO, September 19-22, 1995.
68. Working group chair, Architecture Evaluation, DARPA Evolutionary Design of Complex Software (EDCS) Workshop, Lake Placid, NY, July 17-19, 1996.
69. Session chair, Platforms for Software Execution, 19th International Conference on Software Engineering (ICSE'97), Boston, MA, May 17-23, 1997.
70. Working group chair, Empirical Software Engineering Research Roadmap, Empirical Software Engineering Conference, Dagstuhl, Germany, June 26-30, 2006.
71. Session chair, Systems of Systems Process Critical Success Factors, Convocation of the Center for Systems and Software Engineering, University of Southern California, Los Angeles, CA, October 23-26, 2006.
72. Session chair, Acquisition and Contracting Mismatches, Executive Workshop on Systems and Software Engineering, University of Southern California, Los Angeles, CA, February 12-15, 2007.
73. Working group chair, Requirements Volatility, Executive Workshop on Systems and Software Engineering, University of Southern California, Los Angeles, CA, February 12-15, 2007.
74. Session chair, Roadmap Definition for Empirical Software Engineering, International Software Engineering Research Network (ISERN), Madrid, Spain, September 17-18, 2007.
75. Working group co-chair, Software Risk and Estimation, Department of Defense Software in Acquisition Workshop, Arlington, VA, October 16-17, 2007.
76. Workshop chair, Systems and Software Engineering Integration: Technical Aspects, 22nd International Forum on Systems, Software, and COCOMO Cost Modeling, University of Southern California, Los Angeles, CA, October 30 – November 1, 2007.
77. Working group co-chair, Software Risk and Estimation, Department of Defense Software in Acquisition Workshop, Alexandria, VA, April 15-16, 2008.
78. Working group co-chair, Systems/Software Acquisition and Process Issues, Systems/Software Incremental Commitment Model (ICM) Workshop, Washington, DC, July 14-17, 2008.
79. Session chair, Roadmap Definition for Empirical Software Engineering, International Software Engineering Research Network (ISERN), Kaiserslautern, Germany, October 6-7, 2008.
80. Session chair, Software in Acquisition Roundtable, 11th Annual National Defense Industrial Association (NDIA) Systems Engineering Conference, San Diego, CA, October 20-23, 2008.

81. Session chair, Culture Matters: An Approach to International Research Agreements, National Academies' Government-University-Industry Research Roundtable (GUIRR), National Academy of Sciences, Washington, DC, July 29-31, 2013.
82. Session chair, Aerospace and Defense, 2nd Annual Global Supply Chain Excellence Summit, University of Southern California, Los Angeles, CA, September 26, 2014.

Referee

83. Referee, *IEEE Transactions on Software Engineering*.
84. Referee, *IEEE Transactions on Reliability*.
85. Referee, *IEEE Computer*.
86. Referee, *IEEE Software*.
87. Referee, *ACM Transactions on Programming Languages and Systems*.
88. Referee, *ACM Transactions on Software Engineering and Methodology*.
89. Referee, *Communications of the ACM*.
90. Referee, *Software Practice and Experience*.
91. Referee, National Science Foundation.
92. Referee, Army Research Office.
93. Referee, University of California, Microelectronics Innovation and Computer Research Opportunities (MICRO) Program.
94. Referee, Academic Press, San Diego, CA.
95. Referee, Richard Jones Publishing, Moss Beach, CA.
96. Referee, Numerous conferences.

Other community or committee service

97. Committee member, IEEE Technical Council on Software Engineering (TCSE), 1990 – 1997.
98. Proposal evaluation panel member, National Science Foundation, Washington, D.C., April 1991.

99. Panel member, Department of Defense Blue Ribbon Panel on Simulation and Modeling (SAMSA I), Los Angeles, CA, August 1-2, 1995.
100. Panel member, Department of Defense Blue Ribbon Panel on Simulation and Modeling (SAMSA II), Arlington, VA, October 16-17, 1995.
101. Distinguished reviewer, Department of Defense Software Acquisition Managers Handbook (4 volumes), 1996.
102. Panel member, Airlie Software Council, Department of Defense Software Program Managers Best Practices Network, Arlington, VA, August 26-28, 1996.
103. Co-Founder, Technology Committee, Pegasus School (K-8), Huntington Beach, CA, 1996 – 1997.
104. Corporate Sponsor, Platinum Level (\$25,000), 25th International Conference on Software Engineering (ICSE'25), Portland, Oregon, May 2003.
105. Corporate Sponsor (\$5000), COTS-Based Software Development Conference, Los Angeles, CA, Spring 2004.
106. Corporate Sponsor (\$5000), 12th International Software Engineering Research Network (ISERN) Conference, Los Angeles, CA, Spring 2004.
107. Corporate Sponsor, Gold Level (\$15,000), 26th International Conference on Software Engineering (ICSE'26), Edinburgh, Scotland, May 2004.
108. Advisory board member, Systems Engineering Advisory Council (SEAC), Systems and Software Consortium (SSCI), Herndon, VA, 2005 – 2006.
109. Review panel member, Department of Defense Software Challenges Workshop, Software Engineering Institute, Arlington, VA, October 15-16, 2008.

University Service and Committee Activities

Campus- or chair-level service

1. Co-Founder and Principal (with N. Leveson, L. Osterweil, D. Richardson, and R. Taylor), Irvine Research Unit in Software (IRUS), University of California, Irvine, 1990 – 1998.
2. Chair, Computing Resources Committee, Dept. of Information and Computer Science, University of California, Irvine, 1991-92.
3. Representative, Assembly of the Academic Senate, University of California, Irvine, Fall 1994.

4. Chair, Software Faculty Recruiting Committee, Dept. of Information and Computer Science, University of California, Irvine, Spring 1995.
5. Speaker, Campus-wide new student orientation, University of California, Irvine, July 1996.
6. Faculty chair (elected), Dept. of Information and Computer Science, University of California, Irvine, 1996-97.
7. Member (ex officio), Executive Committee, Academic Senate, University of California, Irvine, 1996-97.
8. Assistant Director, Software and Information Technology Research Center (SWIFT), Organized Research Unit (ORU), University of California, 1996-97.

Department-level service

9. Graduate representative, General Committee on Departmental Affairs, Dept. of Computer Science, University of Maryland, 1983-84.
10. Member, Graduate Admissions Committee, Dept. of Information and Computer Science, University of California, Irvine, 1986, 1991-92, 1993-94.
11. Member, Undergraduate Curriculum Reform Committee, Dept. of Information and Computer Science, University of California, Irvine, 1986-87.
12. United Way representative, Dept. of Information and Computer Science, University of California, Irvine, 1986-87.
13. Member, Computing Resources Committee, Dept. of Information and Computer Science, University of California, Irvine, 1986-87, 1987-88, 1989-90, 1990-91, 1991-92.
14. Member, Executive Committee, Dept. of Information and Computer Science, University of California, Irvine, 1987-88 (elected member), 1996-97 (ex officio member).
15. Member, Faculty Mentor Program (for minority students), University of California, Irvine, 1987-88.
16. Member, Honors Committee, Dept. of Information and Computer Science, University of California, Irvine, 1987-88, 1988-89, 1991-92.
17. Member, Disqualification Committee, Dept. of Information and Computer Science, University of California, Irvine, 1987-88, 1988-89, 1989-90.
18. Member, Space Committee, Dept. of Information and Computer Science, University of California, Irvine, 1991-92.

19. Member, Faculty SURF Mentor Program (for minority students), University of California, Irvine, 1992.
20. Member, Personnel Committee, Dept. of Information and Computer Science, University of California, Irvine, 1993-94, 1994-95, 1995-96.
21. Advisor (for 10 students), Undeclared freshman program, University of California, Irvine, Fall 1995.
22. Member, Undergraduate Policy Committee, Dept. of Information and Computer Science, University of California, Irvine, 1995-96.
23. Speaker, High School Seniors Recruitment Day, Dept. of Information and Computer Science, University of California, Irvine, March 1996.
24. Member, Industry Advisory Board, Computer Science Department, University of Southern California, Los Angeles, CA, April 2006 - present.

Honors, Professional Memberships, and Certifications

Family History

1. Descendant of Schuyler Colfax, who was Vice President to President Ulysses Grant from 1869-1873, and Cornelius Van Riper, who was a scribe to General George Washington during the American Revolutionary War.

Honors

2. Eagle Scout, 1975, and Vigil Honor, 1977.
3. Dean's List, St. Olaf College, 1979-81.
4. Departmental Distinction, Mathematics, St. Olaf College, 1981.
5. Outstanding Masters Scholar Award, GE Information Services Co., 1983-84 (\$3000 award).
6. ACM Samuel N. Alexander Ph.D. Fellowship Award, Washington, D.C. Chapter, 1984-85 (\$3000 award).
7. Listing in *Who's Who in California*, 1986-98.
8. *Business Week* ranked the book *Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People* as the #6 national best-selling book for October 1995 and published the ranking in its November 27, 1995 issue.

9. Leader of 13-person team that received the Tim W. Hannemann Quality Award, Northrop Grumman Space Technology, 2004 (which is the highest quality award and named for a previous CEO).
10. Listing in *Who's Who in America*, 2009-present.
11. Golden Apple Award for Teaching Excellence, University of Southern California, Los Angeles, CA, May 2014.

Professional Memberships and Certifications

12. Association for Computing Machinery (ACM), 1981-1997.
13. Institute of Electrical and Electronics Engineers (IEEE), 1983-present. Senior member.
14. IEEE Computer Society, 1983-present.
15. Classification Society of America, 1989-92.
16. US Department of Defense Top Secret clearance and SSBI, 2003-present.
17. Six Sigma "Black Belt," training complete, October 2003-2014.
18. American Institute of Aeronautics and Astronautics (AIAA), 2004-2010.
19. Software Engineering Institute (SEI), Candidate Lead Appraiser for Capability Maturity Model Integration (CMMI), March 2004-2009.
20. International Software Engineering Research Network (ISERN), 2005-2009.
21. International Council on Systems Engineering (INCOSE), 2006-2009.
22. National Defense Industry Association (NDIA) Software Committee (invited), 2007-present.
23. Executive Committee member (elected), IEEE Technical Council on Software Engineering (TCSE), 2009-2016.
24. Chair, Awards Committee, IEEE Technical Council on Software Engineering (TCSE), 2012-2016.
25. Vice Chair, Executive Committee, IEEE Technical Council on Software Engineering (TCSE), 2012-2016.

TEACHING**Ph.D. Committees**

1. Julio Leite, Ph.D. completion June 1988, University of California, Irvine, dissertation title “Viewpoint Resolution in Requirements Elicitation.”
2. Guillermo Arango, Ph.D. completion August 1988, University of California, Irvine, dissertation title “Domain Engineering for Software Reuse.”
3. Tim Shimeall, Ph.D. completion June 1989, University of California, Irvine, dissertation title “An Experiment in Software Fault Elimination and Fault Tolerance.”
4. Chris Pidgeon, Ph.D. completion March 1990, University of California, Irvine, dissertation title “Analyzing Decision Making in Software Design.”
5. Adam Porter, Ph.D. completion December 1991, Committee Chairman, University of California, Irvine, dissertation title “Measurement-Driven Classification Trees to Enable Empirically Guided Software Development.”
 - A. Now an Associate Professor, Dept. of Computer Science, University of Maryland, College Park, MD.
 - B. Received N.S.F. Faculty Early Career Development Award (PYI), 1995.
6. Xiping Song, Ph.D. completion June 1992, University of California, Irvine, dissertation title “Comparing Software Design Methodologies Through Process Modeling.”
7. M. Gregory James, Ph.D. completion December 1992, Committee Co-Chairman with R. Taylor, University of California, Irvine, dissertation title “PRODUSER: a PROcess for Designing USER-interfaces.”
8. Allyn Randall, M.S. completion December 1992, Committee Chairman, University of California, Irvine.
9. R. Kent Madsen, Ph.D. completion December 1993, Committee Chairman, University of California, Irvine, dissertation title “Network-Based Classification of Objects Generated by Software Engineering Processes.”
10. Patrick Young, Ph.D. completion December 1993, University of California, Irvine, dissertation title “Extensible Process Specification for Technical and Non-Technical Users.”
11. Doug Schmidt, Ph.D. completion June 1994, Committee Co-Chairman with T. Suda, University of California, Irvine, dissertation title “An Object-Oriented Framework for Experimenting with Alternative Process Architectures for Parallelizing Communication Subsystems.”

- A. Now a Full Professor, Dept. of Electrical Engineering and Computer Science, Vanderbilt University, Nashville, TN.
12. John Self, Ph.D. completion June 1996, University of California, Irvine, dissertation title "Using Static Concurrency Analysis to Understand the Dynamic Behavior of Concurrent Programs."
 13. Alex Lam, Ph.D. qualifying exam February 2006, University of Southern California.
 14. Danni Wu, Ph.D. qualifying exam December 2006, University of Southern California.
 15. Alex Lam, Ph.D. final defense May 2007, University of Southern California.
 16. Gustavo Perez, Ph.D. qualifying exam December 2007, University of Southern California.
 17. Supannika Koolmanojwong, Ph.D. qualifying exam November 2009, University of Southern California.
 18. Ali Afzal Malik, Ph.D. qualifying exam November 2009, University of Southern California.

Undergraduate and Graduate Courses Taught

1. ICS 195, UC Irvine, Project in System Design, Winter 1986.
2. ICS 280A, UC Irvine, Evaluation of Software Technologies, Spring 1986.
3. ICS 245, UC Irvine, Software Engineering, Fall 1986.
4. ICS 290S, UC Irvine, Software Research Seminar, Fall 1986.
5. ICS 195, UC Irvine, Project in System Design, Winter 1987.
6. ICS 280A, UC Irvine, Evaluation of Software Technologies, Winter 1987.
7. ICS 21, UC Irvine, Intro to Computer Science I (team taught), Fall 1987.
8. ICS 125B, UC Irvine, Project in System Design, Fall 1987.
9. ICS 141, UC Irvine, Programming Language Theory, Fall 1987.
10. ICS 290, UC Irvine, Arcadia Software Environments, Fall 1987.
11. ICS 22, UC Irvine, Intro to Computer Science II (team taught), Winter 1988.
12. ICS 180C, UC Irvine, Software Development with Reusable Components, Winter 1988.

13. ICS 290D, UC Irvine, Arcadia Software Environments, Winter 1988.
14. ICS 290S, UC Irvine, Software Research Seminar, Winter 1988.
15. ICS 290D, UC Irvine, Arcadia Software Environments, Spring 1988.
16. ICS 125B, UC Irvine, Project in System Design, Fall 1988.
17. ICS 245A, UC Irvine, Software Engineering, Fall 1988.
18. Extension, UC Irvine, Object-Oriented Software Development, Fall 1988.
19. Extension, UC Irvine, Advances in Software Engineering, Winter 1989.
20. ICS 280B, UC Irvine, Metrics and Evaluation Methods, Spring 1989.
21. ICS 290M, UC Irvine, Software Measurement, Fall 1989.
22. ICS 22, UC Irvine, Intro to Computer Science II (team taught), Winter 1990.
23. ICS 125B, UC Irvine, Project in System Design, Winter 1990.
24. ICS 198, UC Irvine, Honors Research, Winter 1990.
25. ICS 280D, UC Irvine, Empirically Based Analysis Techniques, Winter 1990.
26. ICS 290M, UC Irvine, Software Measurement, Winter 1990.
27. ICS 52, UC Irvine, Software Construction, Spring 1990.
28. ICS 198, UC Irvine, Honors Research, Spring 1990.
29. ICS 290M, UC Irvine, Software Measurement, Spring 1990.
30. ICS 290M, UC Irvine, Software Measurement, Fall 1990.
31. ICS 125B, Section A, UC Irvine, Project in System Design, Winter 1991.
32. ICS 125B, Section B, UC Irvine, Project in System Design, Winter 1991.
33. ICS 198, UC Irvine, Honors Research, Winter 1991.
34. ICS 290M, UC Irvine, Software Measurement, Winter 1991.
35. ICS 198, UC Irvine, Honors Research, Spring 1991.

36. ICS 280H, UC Irvine, Empirically Guided Development, Spring 1991.
37. ICS 290M, UC Irvine, Software Measurement, Spring 1991.
38. ICS 290S, UC Irvine, Software Research Seminar, Spring 1991.
39. ICS 52, UC Irvine, Software Construction, Fall 1991.
40. ICS 198, UC Irvine, Honors Research, Fall 1991.
41. ICS 245A, UC Irvine, Software Engineering, Fall 1991.
42. ICS 290M, UC Irvine, Software Measurement, Fall 1991.
43. ICS 198, UC Irvine, Honors Research, Winter 1992.
44. ICS 280D, UC Irvine, Empirically Guided Development, Winter 1992.
45. ICS 290M, UC Irvine, Software Measurement, Winter 1992.
46. ICS 198, UC Irvine, Honors Research, Spring 1992.
47. ICS 290M, UC Irvine, Software Measurement, Spring 1992.
48. ICS 197, UC Irvine, Honors Research, Fall 1992.
49. ICS 290M, UC Irvine, Software Measurement, Fall 1992.
50. ICS 290L, UC Irvine, Software Measurement, Winter 1993.
51. ICS 290L, UC Irvine, Software Measurement, Spring 1993.
52. ICS 197, UC Irvine, Honors Research, Fall 1993.
53. ICS 221A, UC Irvine, Software Engineering (team taught), Fall 1993.
54. ICS 52, UC Irvine, Software Construction, Winter 1994.
55. ICS 125B, UC Irvine, Project in System Design, Winter 1994.
56. ICS 226, UC Irvine, Software Measurement, Spring 1994.
57. ICS 229, UC Irvine, Software Research Seminar, Spring 1994.
58. ICS 280E, UC Irvine, Software Quality, Spring 1994.

- 59. ICS 221A, UC Irvine, Software Engineering, Fall 1994.
- 60. ICS 52, UC Irvine, Software Construction, Winter 1995.
- 61. ICS 125B, UC Irvine, Project in System Design, Winter 1995.
- 62. ICS 280, UC Irvine, Best Practice Software Methods, Winter 1995.
- 63. ICS 52, UC Irvine, Software Construction, Fall 1995.
- 64. ICS 125B, UC Irvine, Project in System Design, Fall 1995.
- 65. ICS 221A, UC Irvine, Software Engineering (team taught), Fall 1995.
- 66. ICS 226, UC Irvine, Software Measurement, Spring 1996.
- 67. ICS 229, UC Irvine, Software Research Seminar, Spring 1996.
- 68. ICS 280, UC Irvine, Software Product Development, Spring 1996.
- 69. MBA Program, GSBA 581, University of Southern California, Information Management and Analytics. MBA Professionals and Managers Program (MBA.PM), Los Angeles and Orange County:
 - a. Winter 2008-2009, Winter 2009-2010, Winter 2010-2011, Winter 2011-2012, Winter 2012-2013, Winter 2013-2014, Winter 2014-2015, Ongoing.
- 70. Executive MBA, Theme IV, University of Southern California, Strategy, Information Technology, and Operations. Executive MBA Program (EMBA), Los Angeles and San Diego:
 - a. Spring 2009, Spring 2010, Spring 2011.
- 71. Undergraduate Program, DSO 462, University of Southern California, Managing a Small Business on the Internet:
 - a. Spring 2012, Fall 2012, Spring 2013, Fall 2013, Spring 2014, Fall 2014, Spring 2015, Ongoing.
- 72. MBA Program, DSO 510, University of Southern California, Business Analytics:
 - a. Fall 2013, Spring 2014, Fall 2014, Spring 2015, Ongoing.
