

CURRICULUM VITAE

RAYMOND J. MADACHY, Ph.D.

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LITIGATION SUPPORT

Expert witness for investigating software design/code intellectual property theft, determining the market value of software intellectual property, software project contract performance, and determination of software development “should costs” in support of contract litigation. Methods include forensic software size and quality measurement, use of parametric cost models, productivity analysis, and industry benchmarking within the US and International. Testified in depositions.

RESEARCH INTERESTS

Cost and economic value analysis of software-intensive systems; systems and software measurement; software intellectual property; quantitative methods for systems risk management; process improvement and quality. Modeling and simulation of processes for architecting and engineering of complex systems. Integrating systems engineering and software engineering disciplines, and empirical-based research with process simulation.

EDUCATION

University of Southern California

Ph.D. Industrial and Systems Engineering 12/94 G.P.A. 3.99

Areas: systems engineering, systems architecting, computer science

Dissertation: *A Software Project Dynamics Model for Process Cost, Schedule and Risk Assessment*

University of California, San Diego

M. S. System Science 12/83 G.P.A. 3.7

Comprehensive exam covered digital signal processing and system dynamics

Research in bio-engineering, orbital mechanics and man-machine interface

University of Dayton

B.S. Mechanical Engineering 4/81 Minor: Aerospace Engineering G.P.A. 3.8 Magna Cum Laude

SPONSORED RESEARCH

“Software Cost Estimation Metrics”, Air Force Cost Analysis Agency, PI, \$75,000 for 2009-2010

“Future Directions in Software Development Practices”, National Aeronautics and Space Administration / West Virginia University, Co-PI, \$40,000 for 2008

“Army Future Combat Systems Support”, Sverdrup Technology, Inc., Co-PI, \$450,000 for 2006-2007, \$419,000 extension for 2008

“Software Risk Advisory Tools”, National Aeronautics and Space Administration, Co-PI, \$396,000 for 2006-2008

“System Dynamics Modeling for Sustainable Enterprise Executive Roundtable”, USC Center for Sustainable Cities, \$5,000 M&S for 2008

“A Model of Options and Costs for Reliable Autonomy”, National Aeronautics and Space Administration Human and Robotic Technology Program, Co-PI, \$384,375 for 2005-2006 for the USC portion

“Prometheus Software Tool Evaluation”, Northrop Grumman Space Technology, \$80,000, Co-PI, 2005

“Science of Design”, National Science Foundation, Proposal Lead, \$896,672 for 2005-2008 for the USC portion

“Empirical Research on High Dependability Computing”, National Aeronautics and Space Administration, Co-PI, total contract value \$2,198,872, funded 2001-2004

“CEBASE Support of Future Combat Systems”, Army and DARPA, Research Lead, total contract values of \$3,161,49 funded 2001-2004 and \$566,452 funded 2002-2004

“Teledyne Software Cost Model Development”, Teledyne Systems, \$40,000, 1994

EXPERIENCE

NAVAL POSTGRADUATE SCHOOL – Department of Systems Engineering (8/08-present)

Associate Professor - Research and teaching in systems and software cost estimation; simulation of processes for complex system development; risk assessment and modeling of software-intensive systems; system and software process improvement; and software tool development of the models. Primarily teaching *Engineering Economics and Cost Estimation*, and *Capability Engineering*. Coordination of software engineering and economics curriculum in the department.

UNIVERSITY OF SOUTHERN CALIFORNIA - Departments of Industrial and Systems Engineering and Computer Science (1/95-8/08)

Research Assistant Professor (Industrial and Systems Engineering) (1/07-present), *Research Scientist* (7/05-12/06, part-time 1/04-12/04), *Research Associate* (part-time 2/02-1/04), *Consultant* (part-time 1/02-2/02)

Interim Director, Systems Architecting and Engineering Program, Fall 2007

Sponsored research at the *USC Center for Systems and Software Engineering* in systems and software cost estimation; risk assessment and modeling; software process modeling, measurement and analysis; defect modeling; and software tool evaluation. As Interim Director of the Systems Architecting and Engineering program, activities included proposal development, program outreach and student guidance. Major research projects include several projects for NASA on high dependability computing; reliable autonomy options and costs; integrated modeling of software cost, quality and program risk; and defect modeling. Cost and schedule modeling for complex system-of-systems for the Army's Future Combat Systems; review of program feasibility. Major contributions to winning proposals for NASA and National Science Foundation.

Developed and taught new graduate course *Modeling and Simulation for Systems Architecting and Engineering*.

Adjunct Assistant Professor (1/96-1/02) – Teaching graduate courses *Software Engineering Economics*, *Software Engineering* (initially called *Design and Construction of Large Software Systems*) in Computer Science, and *Discrete Systems Simulation* in Industrial and Systems Engineering. Student projects in *Software Engineering* develop Internet and multimedia applications for USC departments and other stakeholders. Developed and taught new graduate course *Software Process Modeling* in Computer Science.

Lecturer (1/95-1/96) - Teaching undergraduate course *Design and Construction of Large Software Systems* in Computer Science. Performing collaborative research with the USC Center for Software Engineering.

COST XPERT GROUP, INC.

Chief Science Officer (12/01–7/05)

Responsible for research and development of the Cost Xpert systems/software estimation and metrics tools including creation of models and estimating methodologies, data analysis, model verification, new feature recommendation and development, requirements specification and project oversight. New models include global distributed development with multiple teams, integration of system and software costs, generalized models for iterative development of complex systems, and business value tradeoff analysis. Consulting, training and high-end technical support for clients. Improvement of metrics collection and analysis methodologies for clients and internal usage has led to an upcoming tool Metrics Xpert. Support in the development of training material, consulting and marketing assets. Company spokesperson through papers, presentations, conferences, seminars and workshops. Primary support of business strategy and general support of marketing and sales activities. Mentoring of technical staff.

Consultant (3/99-12/01, part-time) – Ongoing consulting support for cost estimation and software metrics engagements.

SOFTWARE ENGINEERING INSTITUTE – (12/01-3/02, part-time)

Visiting Scientist – Support of initiatives to improve software engineering capabilities on government programs. Program acquisition support, process development and tailoring, process modeling and risk management applied to DoD projects.

C-BRIDGE INTERNET SOLUTIONS – C-bridge Institute (3/00-10/01)

Chief Scientist, C-bridge Institute (1/01–present) – Corporate lead for software methodology consulting and training for Internet e-business development. Defining the implementation methodologies and training curriculums, leading development of material content, consulting and training. Created a consulting practice for software cost and schedule estimation. Additional consulting in quantitative business value analysis. Support of strategy, marketing and sales activities. Solely responsible for obtaining several new client engagements and creating industrial alliances. Serving as industry thought leader through papers, presentations, seminars and workshops. Major clients include Fortune 100 banking and insurance, aerospace/defense, high technology manufacturing, oil and healthcare companies.

Managing Principal (3/00-12/00) - Consulting and training in business diagnostics and software development methodologies, and performing internal process analysis. Responsible for software process definition, quantitative process analysis, process improvement, process asset development and associated training. Lead for software cost estimation, and managed Internet cost tool development project. Diagnostic work focusing on Internet readiness assessment and supporting business value analysis. Creation and delivering of internal and external courses/seminars on software cost estimation, business diagnostics, process methodology, software engineering best practices, quality assurance and risk management.

LITTON SYSTEMS (12/92-3/00)

LITTON GUIDANCE AND CONTROL SYSTEMS DIVISION - Software Engineering Center of Excellence (9/97-3/00)

Manager, Software Engineering Process Group – Responsible for all software and systems engineering process improvement in the Division. Directed organization-wide efforts to achieve CMM Level 4 per certified CBA/IPI software process assessment (scored in top 2.6% of over 800 organizations). Exceeded Division goal of Level 3; subsequently received special bonus and entry into the executive Incentive Compensation program. Planning and managing of process definition and web-based process asset development; performed quantitative process analysis, training, process assessment, SEPG personnel recruitment and hiring, leading management reviews and presenting to Corporate and Division senior staff. Creation and architecting of the heavily used Process Asset Library on the intranet and technical direction of its ongoing development. As of 2004, it is still being used daily by the projects. Also led the development of automated web-based process metrics collection and analysis on the intranet. Performed Chair of the SEPG configuration control board and the metrics working group. Support of cost estimation and risk management activities. The SEPG consists of about 20 full-time and part-time software managers and leads, systems engineers, webmasters, representatives from other disciplines (software quality assurance, configuration management, project engineering, program management), technical, administrative and clerical staff.

LITTON DATA SYSTEMS DIVISION - Software Technology Group (12/92-9/97)

Senior Engineering Specialist - Lead responsibility for division software metrics policies, procedures and analysis; lead for cost estimation and risk management; organizational process improvement activities in the SEPG. Planning, overseeing data collection, training, database creation and maintenance, metrics analysis, reporting to executive management. Division-wide analysis of all software engineering activities across multiple product lines and generation of productivity/quality baseline reports including process improvement evaluation. Design and technical supervision of in-house cost estimation tool development and metrics database programming for integrated software engineering environment. Development of cost estimating process for all division engineering activities. Support of proposal cost estimation and risk management activities. Representative for software engineering and systems engineering organizations in Division Intranet working group.

INDEPENDENT CONSULTANT - (4/97- current, part-time)

Training and consulting to major corporations on software cost estimation, software metrics, risk management and process improvement. Metrics-based assessments of project cost, schedule and quality for 1) process improvement baselining and 2) forensic fact finding and litigation support as an expert witness. Litigation-support services include assessment of software project contract performance, determining the market value of software intellectual property (IP), software IP design theft, and determination of “should costs” of software in support of contract litigation. Testified in depositions.

LIBRASCOPE CORPORATION - Software Engineering Department (8/88-12/92)

Staff Engineer (10/91-12/92) - Reported directly to VP of Engineering. Responsible for all AN/BSY-2 software metrics for a project of 400 KSLOCs: planning, data collection, database creation and maintenance, metrics analysis, reporting of data to the customer and overseeing procedural changes in the S/W development process to support metrics. Cost account manager for S/W management and display S/W development including estimates to complete. Status and schedule reporting for displays S/W. Developed in-house cost estimation tools and performed COCOMO calibration. Developed relational database programs for S/W metrics, code status reporting and cost accounts. Continued to direct requirements analysis for display S/W. Supported proposal efforts and Software Engineering Institute compliance activities.

Lead Software Engineer (4/89-10/91) - Led group to develop four CSCIs that provide display and MMI services for the AN/BSY-2 submarine combat system. Real-time embedded software over 150 KSLOCs developed and documented per DoD 2167. Cost account manager responsible for \$2.5M budget. Executive management status reviews and liaison with prime contractor and customer. Requirements analysis, top level design, equipment selection and purchase, management of project schedule, liaison to hardware and systems engineering and overall systems responsibility. Software change and control board member. Design review coordination and successful PDR and CDR activities. Group size increased from 9 to 30 engineers and programmers.

Programming research specialist (8/88-4/89) - Technical lead for Display Support CSCI within the graphics engine for advanced AN/BSY-2 tactical combat system. Requirements analysis, top level design, equipment selection and purchase, management of project schedule, liaison to hardware and systems engineering departments. Successfully integrated first graphics engine prototype in VAX lab using ADA and C, including hardware integration.

INDEPENDENT CONSULTANT - Marx-Glenn Associates (8/88-12/88, part-time)

Software development for radiological image processing on Mac II.

UCLA - Department of Radiological Sciences, Image Processing Laboratory (1/87-8/88)

Laboratory manager - Computer system management, hardware allocation and equipment purchase. Team leader of development for an automatic ultrasound image acquisition and networking system. Creation of cell parameter analysis software for cervical cell biopsies. Creation of microscopic biomedical image true color analysis software. Development of software for three dimensional reconstruction from tomographic images. Initiation, development and implementation of laboratory utilities for software configuration management and hardware time allocation. Digital hardware integration. Preliminary study of PACS digital X-ray system for space station. CPU's: VAX 11/750, Sun 3, Macintosh II, PC Image processors: Gould DeAnza, Pixar, Matrox

INDEPENDENT CONTRACTOR - TRW Electronics and Defense (10/85-9/86)

Dual position for over-the-horizon radar using VAX network and Aydin consoles.

Display Software Development: Design, development and local testing of detection and tracking display software. Enhancements for man-machine interface.

Software Engineering Integration and Test: Integration and formal testing for correlation and identification software. Trajectory analysis and test result analysis. Problem identification and resolution including overseeing of software maintenance. Revision of test procedures. VAX Fortran and Macro on TRW testbed system.

HUGHES AIRCRAFT CO. - Radar Systems, Advanced Programs Division (12/82-10/85)

Requirements analysis, algorithm design, development, testing and integration of real-time tactical software for multi-functional Flexar radar on a VAX 11/780. Responsible for controls and display, radar unit control, timing and control and search pattern modules. Testing of timing software with digital logic analyzer to monitor hardware bit functions. Development of offline test drivers. Real-time and offline graphics using various refresh devices, terminals and plotters. Management of software documentation. Develop of real-time color display for Ku-band radar hardware demonstration. Secret security clearance.

GENERAL DYNAMICS - Convair Division, Mission Analysis and S/W Dept. (6/81-12/82)

Mission planning and analysis for advanced cruise missile development on a VAX 11/780 and analysis of space missions on a Cyber 170; emphasis on optimization algorithms. Generation of mission data (flight path and terrain navigation data) and on-board mission data magtape for top secret missile. Modification and software validation of automated mission planning system on VAX. Integration of guidance and control algorithms into simulation. Proposal writing and software trade-off studies. Secret security clearance.

UNIVERSITY OF DAYTON RESEARCH INSTITUTE - Mechanical Engineering, Aerospace Mechanics (9/79-5/81)

Scientific programming on a VAX 11/780, Univac and TRS-80 in Fortran and Basic. Mathematical modeling of thermodynamic and fluid analysis of ejector nozzle and rankine cycle; illustration of results. Set up TRS-80 computer system for research purposes and was responsible for continued upkeep, evaluation and personnel training.

GENERAL MOTORS - Delco Air Conditioning Division (5/79-9/80)

Scientific programming to compute compressor performance using new efficient calorimeter testing procedure. Led to designing and execution of experiments to verify the procedure. Revised for interactive I/O of test data. Analysis of test data using SAS and graphics packages on GM Research Computer (IBM 360 TSO network). Initial experience in calorimeter testing of compressors and AC test instrumentation modification.

UNIVERSITY OF DAYTON RESEARCH INSTITUTE - Applied Systems Analysis Dept. (5/78-5/79)

Computer programming, data reduction, technical illustrations and editing of scientific research reports. Work involved avionics, aeronautical defense component systems, energy research and technological forecasting. U.S. Security clearance obtained.

PUBLICATIONS

BOOKS (2)

R. Madachy, *Software Process Dynamics*, Wiley-IEEE Press, Hoboken, NJ, 2008

B. Boehm, C. Abts, W. Brown, S. Chulani, B. Clark, E. Horowitz, **R. Madachy**, D. Reifer and B. Steece, *Software Cost Estimation with COCOMO II*, Prentice-Hall, 2000

BOOK CHAPTERS (4)

Petkov D., Edgar-Nevill D., **Madachy R.**, and O'Connor R, "Towards a Wider Application of the Systems Approach in Information Systems and Software Engineering", In *Emerging Systems Approaches in Information Technologies: Concepts, D. Paradice (Ed.) Theories, and Applications*, IGI Publishing, 2010

Petkov D., Edgar-Nevill D., **Madachy R.**, and O'Connor R., "Information Systems, Software Engineering and Systems Thinking: Challenges And Opportunities", in *Strategic Information Systems: Concepts, Methodologies, Tools, and Applications*, M. Gordon Hunter (Ed.), 2009

R. Madachy and B. Boehm, *Software Dependability Applications*, Software Process Modeling, Kluwer Academic Publishers, 2004

R. Madachy, *Simulation in Software Engineering*, Encyclopedia of Software Engineering, Second Edition, Wiley and Sons, Inc., New York, NY, 2001

REFEREED CONFERENCE PROCEEDINGS EDITOR

Q. Wang, V. Garousi, **R. Madachy**, D. Pfahl (Eds.), *Trustworthy Software Development Processes: International Conference On Software Process, ICSP 2009, Vancouver, Canada, 2009*

REFEREED JOURNALS (18)

T. Menzies, S. Williams, O. Elrawas, D. Baker, B. Boehm, J. Hihn, K. Lum, and **R. Madachy**, *Accurate Estimates Without Local Data*, Software Process Improvement and Practice, Vol. 14, 2009

R. Madachy, *Cost Modeling of Distributed Team Processes for Systems of Systems and Global Development*, Software Process Improvement and Practice, 2008

T. Menzies and O. Elwaras and J. Hihn and M. Feather and B. Boehm and **R. Madachy**, *The Business Case for Automated Software Engineering*, IEEE Automated Software Engineering, 2007

D. Petkov, D. Edgar-Nevill, **R. Madachy**, R. O'Connor, *Information Systems, Software Engineering, and Systems Thinking: Challenges and Opportunities*, International Journal of Information Technologies and the Systems Approach (IJITSA), Information Resources Management Association, pp. 62-78, January 2008

R. Valerdi and **R. Madachy**, *Impact and Contributions of MBASE on Software Engineering Graduate Courses*, Journal of Systems and Software, Vol. 80, Issue 8, August 2007, pp. 1185-1190

R. Madachy, B. Boehm and J. Lane, *Assessing hybrid incremental processes for SISOS development*, Software Process Improvement and Practice, 2007

B. Boehm, L. Huang, A. Jain and **R. Madachy**, *Reasoning about the ROI of Software Dependability: the iDAVE Model*, IEEE Software., Vol. 21, No. 3, 2004

R. Madachy and D. Tarbet, *Case Studies in Software Process Modeling with System Dynamics*, Software Process Improvement and Practice, Spring 2000

R. Madachy and D. Tarbet, *Initial Experiences in Software Process Modeling*, Software Quality Professional, Spring 2000

B. Boehm, E. Horowitz, **R. Madachy** and C. Abts, *Future Trends, Implications in Cost Estimation Models*, Crosstalk, April 2000

K. Bennett, E. Burd, C. Kemerer, M. Lehman, M. Lee, **R. Madachy**, C. Mair, D. Sjoberg and S. Slaughter, *Empirical Studies of Evolving Systems*, Empirical Software Engineering, Vol. 4, No. 4, December 1999, pp. 370-380

M. Kellner, **R. Madachy** and D. Raffo, *Software Process Simulation Modeling: Why? What? How?*, Journal of Systems and Software, Spring 1999

B. Boehm, A. Egyed, D. Port, A. Shah, J. Kwan and **R. Madachy**, *A Stakeholder Win-Win Approach to Software Engineering Education*, Annals of Software Engineering, Vol. 6, 1998

B. Boehm, A. Egyed, J. Kwan, A. Shah, and **R. Madachy**, *Using the WinWin Spiral Model: A Case Study*, IEEE Computer, July 1998

R. Madachy and B. Khoshnevis, *Dynamic Simulation Modeling of an Inspection-Based Software Lifecycle Process*, Simulation, Vol. 69, No. 1, July 1997

R. Madachy, *Heuristic Risk Assessment Using Cost Factors*, IEEE Software, May 1997

R. Madachy, *Knowledge-based Risk Assessment and Cost Estimation*, Automated Software Engineering, Kluwer Academic Publishers, September 1995

B. Boehm, B. Clark, E. Horowitz, C. Westland, **R. Madachy**, and R. Selby, *Cost Models for Future Software Life Cycle Processes: COCOMO 2.0*, Annals of Software Engineering, Vol. 1, Software Process and Product Measurement, J.D. Arthur and S.M. Henry (eds.), J.C. Baltzer AG, Science Publishers, Amsterdam, The Netherlands, 1995, pp. 57-94

DECLINED REFEREED JOURNALS

R. Madachy, *Integrating Business Value and Software Process Modeling*, Journal of Systems and Software, 2006 (invited for special issue but declined)

REFEREED CONFERENCE PROCEEDINGS EDITOR (1)

Q. Wang, V. Garousi, **R. Madachy**, D. Pfahl (Eds.), *Trustworthy Software Development Processes*: International Conference On Software Process, ICSP 2009, Vancouver, Canada, 2009

REFEREED CONFERENCE PROCEEDINGS (75)

- R. Madachy**, B. Boehm, B. Clark, D. Reifer and W. Rosa, *A Sizing Framework for DoD Software Cost Analysis*, Proceedings of the 24th International Forum on COCOMO and Systems/Software Cost Modeling, Cambridge, MA, 2009
- R. Madachy**, *Integrated COCOMO Suite Tool for Education*, Proceedings of the 24th International Forum on COCOMO and Systems/Software Cost Modeling, Cambridge, MA, 2009
- R. Madachy** and R. Valerdi, *Risk Analysis and Mitigation with Expert COSYSMO*, Proceedings of the 24th International Forum on COCOMO and Systems/Software Cost Modeling, Cambridge, MA, 2009
- W. Rosa, B. Clark, **R. Madachy**, D. Reifer and B. Boehm, *Software Cost Metrics Manual*, Proceedings of the 42nd Department of Defense Cost Analysis Symposium, Williamsburg, VA, 2009
- R. Madachy**, *COCOMO Suite Model Unification Tool*, Proceedings of the 23rd International Forum on COCOMO and Systems/Software Cost Modeling, Los Angeles, CA, 2008
- H. Johnson, **R. Madachy**, “Simulating International Space Station Issue Resolution”, Proceedings of AIAA Space 2008 Conference, 2008
- R. Madachy**, B. Haas, H. Bradbury-Huang, J. Newell, R. Vos, M. Rahimi, *Achieving Sustainable Development in Southern California: Collaborative Learning through System Dynamics Modeling*, Proceedings of the 18th International Symposium of INCOSE, Netherlands, 2008 (accepted)
- B. Boehm, D. Ingold, **R. Madachy**, *The Macro Risk Model - An Early Warning Tool for Software-Intensive Systems Projects*, Proceedings of the 18th International Symposium of INCOSE, Netherlands, 2008 (accepted)
- R. Madachy**, B. Boehm, *Assessing Quality Processes with ODC COQUALMO*, Proceedings of the 2008 International Conference on Software Process, Leipzig, Germany, 2008 (accepted)
- R. Madachy**, *Business Valuation with Software Cost Modeling – A Case Study*, Proceedings of the 22nd International Forum on COCOMO and Systems/Software Cost Modeling, Los Angeles, CA, 2007
- R. Madachy**, B. Boehm, *Software Cost Model Comparison for NASA Projects*, Proceedings of the 2007 NASA Cost Symposium, Denver, CO, 2007
- R. Madachy**, R. Valerdi, *Expert COSYSMO*, Proceedings of the 22nd International Forum on COCOMO and Systems/Software Cost Modeling, Los Angeles, CA, 2007
- R. Madachy**, B. Boehm, *ODC COQUALMO*, Proceedings of the 22nd International Forum on COCOMO and Systems/Software Cost Modeling, Los Angeles, CA, 2007
- R. Madachy**, *Distributed Global Development Parametric Cost Modeling*, Proceedings of the 2007 International Conference on Software Process, Minneapolis, MN, 2007
- R. Madachy**, B. Boehm, J. Richardson, M. Feather, T. Menzies, *Value-Based Design of Software V&V Processes for NASA Flight Projects*, Proceedings of AIAA Space 2007 Conference, 2007
- R. Valerdi and **R. Madachy**, *Impact and Contributions of MBASE on Software Engineering Graduate Courses*, Proceedings of 19th Conference on Software Engineering Education and Training, Turtle Bay, HI, IEEE Computer Society, 2006
- R. Madachy**, *Reusable Model Structures and Behaviors for Software Processes*, Proceedings of the Software Process Workshop/Workshop on Software Process Simulation 2006 (SPW/ProSim 2006), Shanghai, China, Springer-Verlag, May 2006
- R. Madachy**, B. Boehm and J. Lane, *Spiral Lifecycle Increment Modeling for New Hybrid Processes*, Proceedings of the Software Process Workshop/Workshop on Software Process Simulation 2006 (SPW/ProSim 2006), Shanghai, China, Springer-Verlag, May 2006
- R. Madachy**, *Simulation for Business Value and Software Process/Product Tradeoff Decisions*, Proceedings of The 8th International Workshop on Economics-Driven Software Engineering Research (EDSER-8) at the 28th International Conference on Software Engineering (ICSE 2006), Shanghai, China, 2006
- J. Richardson, B. Boehm, **R. Madachy**, L. Huang, D. Port and R. Kazman, *Reducing Autonomy Risks through Rational Selection of Verification Strategies*, Proceedings of 2006 Ground Systems Architecture Workshop, Los Angeles, CA, 2006

- B. Boehm, L. Huang and **R. Madachy**, *Integrated Software Cost and Quality Modeling for Program Risk Management*, Proceedings of 2006 Ground Systems Architecture Workshop, Los Angeles, CA, 2006
- R. Madachy**, *Integrating Business Value and Software Process Modeling*, Proceedings of the 2005 Software Process Workshop, Beijing, China, Springer-Verlag, May 2005
- R. Madachy**, *Software Process and Business Value Modeling*, Proceedings of the 6th International Workshop on Software Process Simulation and Modeling, St. Louis, MI, IEE, May 2005
- R. Madachy**, *People Applications in Software Process Modeling and Simulation*, Proceedings of the 6th International Workshop on Software Process Simulation and Modeling, St. Louis, MI, IEE, May 2005
- R. Madachy**, *A Software Product Business Case Model*, Proceedings of the 5th International Workshop on Software Process Simulation and Modeling, 2004
- B. Boehm, J. Bhuta, D. Garlan, E. Gradman, L. Huang, A Lam, **R. Madachy**, N. Medvidovic, K. Meyer, S. Meyers, G. Perez, K. Reinholtz, R. Roshandel and N. Rouquette, *Using Empirical Testbeds to Accelerate Technology Maturity and Transition: The SCROver Experience*, Proceedings of the 2004 International Symposium on Empirical Software Engineering, IEEE Computer Society, 2004
- B. Boehm, A. W. Brown, **R. Madachy** and Y. Yang, *A Software Product Line Life Cycle Cost Estimation Model*, Proceedings of the 2004 International Symposium on Empirical Software Engineering, IEEE Computer Society, 2004
- Y. Chen, B. Boehm, **R. Madachy** and R. Valerdi, *An Empirical Study of eServices Product UML Sizing Metrics*, Proceedings of the 2004 International Symposium on Empirical Software Engineering, IEEE Computer Society, 2004
- R. Madachy**, *Applying GQM to Software Cost, Schedule, and Quality Estimation*, Proceedings of the Software Technology Conference 2004, Salt Lake City, UT, 2004
- R. Madachy**, *A Value-Based Software Product Model*, Proceedings of the Eighteenth International Forum on COCOMO and Software Cost Modeling, USC, Los Angeles, CA, October 2003
- Y. Chen and **R. Madachy**, *Results of eServices Product Sizing Metric Correlations*, Proceedings of the Eighteenth International Forum on COCOMO and Software Cost Modeling, USC, Los Angeles, CA, October 2003
- B. Boehm, Y. Yang and **R. Madachy**, *COPLIMO: A Product-Line Investment Analysis Model*, Proceedings of the Eighteenth International Forum on COCOMO and Software Cost Modeling, USC, Los Angeles, CA, October 2003
- R. Madachy**, *Using Cost Models in Software Risk Management*, Proceedings of the Fourth Joint Annual International Society of Parametric Analysts/Society of Cost Estimating and Analysis International Conference, Orlando, FL, June 2003
- R. Madachy**, *Software Process Concurrence Modeling*, Proceedings of the Fourth Joint Annual International Society of Parametric Analysts/Society of Cost Estimating and Analysis International Conference, Orlando, FL, June 2003 (to be published) and Proceedings of the Software Management/Applications of Software Measurement 2003 Conference, San Jose, CA, June 2003
- R. Madachy**, *Tutorial: Use of Cost Models in Risk Management*, Proceedings of the Seventeenth International Forum on COCOMO and Software Cost Modeling, USC, Los Angeles, CA, October 2002
- D. Reifer and **R. Madachy**, *COCOMO II/SEER Rosetta Stone*, Proceedings of the Seventeenth International Forum on COCOMO and Software Cost Modeling, USC, Los Angeles, CA, October 2002
- R. Madachy**, *Software Process Concurrence*, Proceedings of the 2002 International System Dynamics Conference, Palermo, Italy, July, 2002
- R. Madachy**, *Software Schedule Analysis with Process Concurrence*, Proceedings of the Sixteenth International Forum on COCOMO and Software Cost Modeling, USC, Los Angeles, CA, October 2001
- R. Madachy**, *COCOMO II: Airborne Radar System Example*, Proceedings of the Fifteenth International Forum on COCOMO and Software Cost Modeling, USC, Los Angeles, CA, October 2000

D. Reifer and **R. Madachy**, *An Introduction to COCOMO II.2000* (tutorial), Proceedings of the Software Technology Conference 2000, Salt Lake City, UT

R. Madachy, *PAL-Enabled Software Metrics and Process Automation*, Proceedings of the Litton Software Technology Management Conference, Santa Barbara, CA, February 2000

R. Madachy, *Cost/Schedule/Process Modeling via System Dynamics*, Proceedings of the Fourteenth International Forum on COCOMO and Software Cost Modeling, USC, Los Angeles, CA, October 1999

R. Madachy and D. Tarbet, *Initial Experiences in Software Process Modeling*, Proceedings of the 14th International Forum on COCOMO and Software Cost Modeling, Software Engineering Institute, Los Angeles, CA, October 1999

R. Madachy and D. Tarbet, *Case Studies in Software Process Modeling with System Dynamics*, Proceedings of the ProSim '99 Workshop, Silver Falls, OR, June, 1999

R. Madachy, *An Advanced Process Asset Library*, Proceedings of the Tenth Software Engineering Process Group Conference, Atlanta, March 1999, and the Litton Software Technology Management Conference, Dana Point, CA, February 1999

R. Madachy, *Tutorial: System Dynamics Modeling Applied to Software Development Processes*, Proceedings of ProSim '98 Workshop, Silver Falls, OR, June, 1998

B. Boehm, A. Egyed, J. Kwan, and **R. Madachy**, *Developing Multimedia Applications with the WinWin Spiral Model*, Proceedings of the Sixth European Software Engineering Conference and Fifth ACM SIGSOFT Symposium on the Foundations of Software Engineering, Zurich, Switzerland, Springer Verlag, September 1997

R. Madachy, R. Nakahara and M. Cochran, *An Intranet-Based Software Cost Estimation Tool*, Proceedings of the Litton Software Technology Management Conference, Santa Barbara, CA, February 1997

R. Madachy, *Tutorial: Process Modeling with System Dynamics*, Conference on Software Process Improvement, UC Irvine, January, 1997, and Proceedings of the Eighth Software Engineering Process Group Conference, Atlantic City, NJ, May 1996

R. Madachy, *Modeling Software Processes with System Dynamics: Current Developments*, Proceedings of the 1996 International System Dynamics Conference, Cambridge, MA, July, 1996

R. Madachy, *System Dynamics Modeling of an Inspection-Based Process*, Proceedings of the Eighteenth International Conference on Software Engineering, IEEE Computer Society Press, Berlin, Germany, March 1996

R. Madachy, *System Dynamics Modeling of an Inspection-Based Process*, Proceedings of the Litton Software Technology Management Conference, Santa Barbara, CA, April 1996

R. Madachy, *System Dynamics and COCOMO: Complementary Modeling Paradigms*, Proceedings of the Tenth International Forum on COCOMO and Software Cost Modeling, SEI, Pittsburgh, PA, October 1995

R. Madachy, *Measuring Inspections at Litton*, Proceedings of the Sixth International Conference on Applications of Software Measurement, Orlando, FL, Software Quality Engineering, October 1995 (best paper award)

R. Madachy, *Knowledge-based Risk Assessment and Cost Estimation*, Proceedings of the Ninth Knowledge-Based Software Engineering Conference, Monterey, CA, IEEE Computer Society Press, September 1994

R. Madachy, *Process Improvement Analysis of a Corporate Inspection Program*, Proceedings of the Seventh Software Engineering Process Group Conference, Boston, May 1995, and the Litton Software Technology Management Conference, Newport Beach, CA, April 1995

B. Boehm, B. Clark, E. Horowitz, C. Westland, **R. Madachy**, and R. Selby, *Cost Models for Future Software Life Cycle Processes: COCOMO 2.0*, Proceedings of the Eighth Annual Software Technology Conference, Salt Lake City, UT, April 1995

R. Madachy, *Dynamic Modeling of an Inspection-Based Process*, Proceedings of the 1995 California Software Symposium, UC Irvine, April 1995

R. Madachy, *Development of a Cost Estimation Process*, Proceedings of the Ninth International Forum on COCOMO and Software Cost Modeling, USC, Los Angeles, CA, October 1994

R. Madachy and L. Little, *Analysis of a Successful Inspection Program*, Proceedings of the Eighteenth Annual Software Engineering Workshop, NASA/SEL, Goddard Space Flight Center, Greenbelt, MD, December 1993 (primary author)

R. Madachy, *Knowledge-Based Assistance for Software Cost Estimation and Project Risk Assessment*, Proceedings of the Eighth International Forum on COCOMO and Software Cost Modeling, SEI, Pittsburgh, PA, October 1993, and the Litton Software Technology Management Conference, Santa Barbara, CA, April 1994 (best paper award)

R. Madachy, *CASE and Hypertext Integration Issues*, The Third Annual Teamworkers International User Group Conference, San Diego, CA, March, 1990

R. Madachy, P. Dousette and S. Sperling, *Libroscope CASE Position*, Advance Working Papers of Third International Workshop on CASE. Imperial College, London, UK, July, 1989

R. Madachy, *Digital Image Analysis of Cervical Biopsies*, 1989 SPIE Medical Imaging III, Newport Beach, CA, February 1989

R. Madachy, *True Color Image Analysis for Determination of Bone Growth in Fluorochromic Biopsies*, 1989 SPIE Medical Imaging III, Newport Beach, CA, February 1989

R. Madachy, *Automatic Digital Ultrasound Image Acquisition and Networking*, Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society, New Orleans, LA, November 1988

R. Madachy, *Image Analysis for Automatic Classification of Mitotic Cervical Cells*, Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society, New Orleans, LA, November 1988

R. Madachy, *True Color Image Analysis of Fluorochromic Bone Biopsies*, Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society, New Orleans, LA, November 1988

R. Madachy, *Automatic Digital Ultrasound Image Acquisition and Networking*, Poster paper at 74th Scientific Assembly of the RSNA, Chicago, IL, November 1988

TECHNICAL REPORTS AND SPONSORED RESEARCH REPORTS (23)

R. Madachy, B. Boehm, "Comparative Analysis of COCOMO II, SEER-SEM and True-S Software Cost Models", University of Southern California, USC-CSSE-2008-816, 2008

R. Madachy, *Risk Model Report and Demonstrations*, Report to NASA AMES, December 2007

R. Madachy and B. Boehm, *Detailed Plans for CY 2008: Software Risk Advisory Tools Enhancements*, Report to NASA AMES, September 2007

D. Ingold and **R. Madachy**, *NASA Macro Risk Model Detailed Case Study*, Report to NASA AMES, October 2007

R. Madachy and B. Boehm, *Detailed ODC COQUALMO and Accuracy Analysis*, Report to NASA AMES, July 2007

R. Madachy and B. Boehm, *Calibration of ODC COQUALMO to Predict V&V Effectiveness*, Report to NASA AMES, March 2007

R. Madachy, *Continuous Risk Model Design, Implementation and Calibration*, Report to NASA AMES, January 2007

R. Madachy, *6G Software Cost and Defect Data Collection Form*, Form to NASA AMES, October 2006

R. Madachy, *Cost Model Comparison Report*, Report to NASA AMES, Update Version, October 2006

R. Madachy, *JPL Delphi Survey for V&V Defect Detection Efficiencies*, Form to NASA JPL, November 2006

D. Ingold and **R. Madachy**, *Risk Model Calibration Report*, Report to NASA AMES, November 2006

R. Madachy, *Model Comparison Report*, Report to NASA AMES, July 2006

R. Madachy and B. Boehm, *MOCA Final Report*, Report submitted to the NASA/USRA MOCA project, March 2006

R. Madachy, *Using ODC COQUALMO to Quantify Risk Exposure for AUTONOMO: Approach and Example*, Report submitted to the NASA/USRA MOCA project, October 2005

R. Madachy, *MOCA AUTONOMO Calibration White Paper*, Report submitted to the NASA/USRA MOCA project, September 2005

R. Madachy, *Incremental COCOMO II and Initial System-of-Systems Common Operating Environment (SOSCOE) Sensitivity Analysis*, Report submitted to the Army/DARPA Future Combat Systems (FCS) project, August 2005

R. Madachy, *Defect Field Descriptions Supporting the High Dependability Computing Program*, submitted to NASA-JPL and USC-CSE Technical Report (pending), August 2005

B. Boehm, L. Huang, A. Jain, and **R. Madachy**, *The Nature of Information System Dependability: A Stakeholder/Value Approach*, USC-CSE Technical Report, 2004

R. Madachy, *Incremental COCOMO II and Initial SOSCOE Sensitivity Analysis*, submitted to Boeing for the Army/DARPA Future Combat Systems (FCS) project, September 2004

R. Madachy, *FCS Software Cost and Schedule Data Collection*, prepared for contractors on the Army Future Combat Systems (FCS) project, July 2002

R. Madachy and B. Boehm, *MDS Software Adoption Cost Analysis*, submitted to NASA-JPL, July 2002

R. Madachy, D. Reifer and B. Boehm, *FCS Software Cost Estimation Initiative Plan*, submitted to Boeing for the Army/DARPA Future Combat Systems (FCS) project, May 2002

R. Madachy, *FCS COCOMO Tutorial*, prepared for contractors on the Army/DARPA Future Combat Systems (FCS) project, August 2002

R. Madachy, *COCOMO II to SEER Rosetta Stone*, Report submitted to the Army/DARPA Future Combat Systems (FCS) project, July 2002

PROPOSALS

Information for Lockheed Martin Corporation on Systems & Systems of Systems Architecting Certificate and Degree Programs, primary author and lead integrator, submitted to the Lockheed Martin Corporation, September 2007

UNREFEREED PUBLICATIONS AND BOOK REPRINTS (5)

B. Boehm, A. Egyed, J. Kwan, A. Shah, and **R. Madachy**, *Developing Multimedia Applications with the WinWin Spiral Model*, ACM Software Engineering Notes, Vol. 22, Issue 6, November 1997

B. Boehm, B. Clark, E. Horowitz, C. Westland, **R. Madachy**, and R. Selby, *The COCOMO 2.0 Software Cost Estimation Model: A Status Report*, American Programmer, Cutter Information Corp., July 1996, and reprinted in *Software Management*, Fifth Edition, IEEE Computer Society Press, Washington D.C., 1996

R. Madachy, *Measuring Inspections at Litton*, Software Quality Assurance, Ridgetop Publishing, Silvertown, OR, Vol. 3, No. 3, 1996

B. Boehm, B. Clark, E. Horowitz, C. Westland, **R. Madachy**, and R. Selby, *Cost Models for Future Software Life Cycle Processes: COCOMO 2.0*, reprinted in a chapter of *Software Engineering Project Management, Second Edition*, Richard Thayer, IEEE Computer Society, 1997 (originally in Proceedings of the Eighth Annual Software Technology Conference, Salt Lake City, UT, April 1995)

UNREFEREED CONFERENCE PROCEEDINGS (5)

R. Madachy, B. Boehm, W. Rosa, B. Clark, *Improving Empirical Software Cost Analysis for the DoD*, Proceedings of the 2009 International Symposium on Empirical Software Engineering and Measurement (Poster), 2009

W. Rosa, B. Clark, **R. Madachy**, *Software Cost Metrics Manual*, Proceedings of the 42nd Annual Department of Defense Cost Analysis Symposium, Williamsburg, VA, 2009

R. Madachy, *Using Empirical Data in Software Process Simulation*, Proceedings of the 11th International Software Engineering Research Network Meeting, October 2003

R. Madachy, *New Processes for Rapid Software Development* (invited talk), Proceedings of the Fifth World Conference on Systemics, Cybernetics and Informatics and the Seventh International Conference on Information Systems Analysis and Synthesis, IEEE Computer Society, Orlando, FL, July 2001

R. Madachy, *Litton Guidance and Control Systems Software Process Overview* (invited talk), Proceedings of the Software Engineering Institute High Maturity Practices Workshop, Pittsburgh, PA, November 1999

OTHER PRESENTATIONS AND PUBLICATIONS

Numerous invited talks and tutorials at academic/industry workshops, research reviews, and professional organizations including OSD-ATL, Software Process Improvement Network chapters, the Project Management Institute and the Software Quality Assurance Association.

Three computer book reviews in "Journal of Recreational Mathematics", Vol. 17, nos. 2, 3 and 4 (1984-85)

HONORS, AWARDS

- Nomination from Litton Guidance and Control Systems Division VP for corporate-wide Litton Software Excellence Award 12/99 (award decision still pending when left company)
- Honorable Mention for Litton Advanced Technology Achievement Award (all Litton divisions) 6/96
- Best paper award at Sixth International Conference on Applications of Software Measurement 10/95
- Co-recipient of Litton Data Systems Continuous Measurable Improvement major award 2/95
- Best paper award at Litton Software Technology Management Conference (all Litton divisions) 4/94
- Best graduate student paper at 1988 Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 11/88
- First place winner of 1988 UCLA Crump Prize for research in medical engineering from Crump Institute for Medical Engineering for *Image Analysis for Automatic Classification of Mitotic Cells in Cervical Biopsies*, 4/88
- Received General Dynamics Excel Award for generation of mission data and on-board tape for advanced flight test program. 6/82
- Winner of national technical paper contest sponsored by Gearhart Industries for *Magnetic Core Memory Vs. MOS Chips for Operating Computers on Trucks*. 4/81
- Chosen twice to represent the University of Dayton in the 1980 and 1981 editions of "Who's Who Among Students in American Universities and Colleges".

SERVICE

- Editorial review board member for International Journal of Information Technology and the Systems Approach, 2007-2009
- Program Chair and on program committee for International Forum on COCOMO and Systems/Software Cost Modeling 1994-2010 (Chair in 1998-2001)
- Program Co-chair, Publicity Chair and Program committee for International Conference on Software Process 2007-2010 (Program Co-chair 2009) (Registration Chair 2008)
- Program committee for Software Process Simulation Modeling Workshop 1998-2000, 2003, 2005-2006
- Program committee and Registration Chair for International Symposium on Empirical Software Engineering (ISESE) 2004
- Program committee for International Conference on COTS-Based Software Systems (ICCBSS) 2004
- Program committee for California Software Symposium 1997-1999
- Co-chairman of Los Angeles Software Process Improvement Network steering committee 1996-1998
- Program committee for Feedback and Evolution in Software and Business Processes (FEAST) Workshop 2000
- Reviewer for refereed journals including IEEE Transactions on Software Engineering, Journal of Systems and Software, IEEE Software, IEEE Computer, Information and Software Technology, 1996-2010

SOCIETIES AND MEMBERSHIPS

- Institute of Electronic and Electrical Engineers (senior member)
- International Council on Systems Engineering
- Association for Computing Machinery
- American Institute of Aeronautics and Astronautics
- Tau Beta Pi National Engineering Honor Society
- Pi Tau Sigma National Mechanical Engineering Honor Society