

GRUIA-CATALIN ROMAN

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Professional Contact

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Education

- 1974-76 *Ph.D. in Computer and Information Sciences.*
University of Pennsylvania, Philadelphia, PA.
- 1974 Master of Science for Graduate Work in Computer and Information Sciences.
University of Pennsylvania, Philadelphia, PA.
- 1971-73 *Bachelor of Science in Computer Science and Engineering (Summa Cum Laude).*
Fulbright Scholar. University of Pennsylvania, Philadelphia, PA.

Professional Experience

ACADEMIC APPOINTMENTS

University of New Mexico

2011- Professor of Computer Science

Washington University in St. Louis

2004-11 Harold B. and Adelaide G. Welge Professor of Computer Science

1990-04 Professor of Computer Science

1981-90 Associate Professor of Computer Science

1976-81 Assistant Professor of Computer Science

ADMINISTRATIVE APPOINTMENTS — University of New Mexico

University of New Mexico is a public institution founded in 1889. Located in Albuquerque, it is the flagship university in the state serving a student population of 27,000 and offering a comprehensive set of programs including engineering, medicine, law, arts and sciences, business, et al.

The School of Engineering has a nominal faculty of 100, consists of six departments, and offers a wide range of BS, MS, and Ph.D. degrees in engineering, computing, and multidisciplinary fields of study. The School enrolls a diverse student body (1,800 undergraduates, 300 MS students, and 400 doctoral candidates) and places a strong emphasis on achieving student success. The faculty engages in highly visible research (annual research expenditures from outside sources exceed \$300,000 per faculty) and spearheaded many successful enterprises, more than any other unit in the university.

2011-14 *Dean of the School of Engineering*

The Dean reports directly to the Provost and has a close working relation with all members of the administration as well as with the deans from all the other schools. He exercises

approval authority over all faculty and staff appointments in the School and is responsible for strategic planning, every day management of school affairs, budgeting (up to \$18 mil in operating costs and \$30 mil in research expenditures), marketing, fundraising, etc.

Special achievements:

- *Developed ambitious and creative plans for economic development, internationalization, and student success and led the university efforts in all these areas.*
- *Raised over \$20 mil from donors, reengaged successful alumni with the School, and secured from the state the \$20 mil needed for renovating the Farris Engineering Center.*
- *Streamlined the School organization with the goal of making it more functional.*
- *Increased faculty participation in school-level policy formulation and planning.*
- *Developed plans and secured approval for launching the Department of Nuclear Engineering and the Department of Chemical and Biological Engineering.*
- *Adopted a business-like financial model that predicted with high accuracy the impact of university level policies on school resources.*
- *Adopted policies that are rational, fair, and uniformly applied.*
- *Reached out to academic and governmental institutions in Argentina, Brazil, China, Spain, Romania, and others in an effort to establish novel international joint programs and to increase graduate enrollments.*
- *Strong and passionate advocacy for the School increased its reputation regionally, nationally, and internationally as well as with alumni, regents, legislators, and others.*

ADMINISTRATIVE APPOINTMENTS — Washington University in St. Louis

Washington University in St. Louis is an independent university known internationally for excellence in teaching and research. Founded in 1853, the University educates over 11,000 full-time students, was ranked 14th by U.S. News and World Report in the undergraduate category for 2011, and has been associated with a long list of Nobel Prize laureates.

*The **Department of Computer Science and Engineering** had a nominal faculty of 26 making it the largest department in the School of Engineering and Applied Science. The Department offers BS, MS, and Ph.D. degrees in computer science and in computer engineering, enjoys an excellent record of placing doctoral graduates in academic and research positions, prides itself on educating some of the most talented undergraduates in the nation, engages in highly visible research (annual research expenditures from outside sources exceed \$250,000 per faculty), and spearheaded several successful enterprises.*

2008-11 *Chair, Department of Computer Science and Engineering*

1997-07 (known as Department of Computer Science prior to 2002)

*The **chair** reports directly to the Dean of Engineering, interacts closely with the Provost and the Chancellor, and has a working relation with the deans and chairs from all other schools. He oversees a faculty of about 26, has an immediate staff of five, and exercises approval authority over all departmental appointments (senior professors, lecturers, researchers, research assistants, graders, etc.). The chair is responsible for all activities associated with faculty and graduate student recruiting, strategic planning, every day management of departmental affairs, disposition of departmental cash reserves (\$1 to \$1.5 mil), and budgeting (up to \$10 mil).*

Special achievements:

- *In the span of one decade the department faculty grew from 14 to a high of 26.*
- *Sound fiscal policies allowed the Department to post almost \$6 mil in cumulative surpluses during a period of aggressive growth while maintaining large cash reserves.*
- *The Department enjoyed the reputation of functioning well with minimal overhead thanks to a management style that emphasized effectiveness, broad participation, judicious delegation of both authority and responsibility, openness, and fair application of published policies.*
- *As chair I gained the reputation of being a passionate and effective advocate for multidisciplinary research and education, particularly by forging a strong partnership with the School of Medicine, a world leader in medical science.*
- *Above all, I nurtured a culture that emphasized high expectations, collegiality, collaboration, and mutual respect.*

OTHER SIGNIFICANT RESPONSIBILITIES — Washington University in St. Louis

- 2008-11 Co-Director, BJHF-ICTS Clinical & Translational Research Funding Program
- *The position entailed the administration of Institute of Clinical and Translational Sciences research funds (\$1 mil to \$2 mil) that were being awarded annually in a competitive way to investigators pursuing new pilot studies likely to lead to future research that will promote the translation of medical science research into clinical practice.*
- 2005-07 Engineering representative, Coordinating Council for Diversity Initiatives
- *The appointment was in recognition of my intense efforts to increase diversity among faculty and students in our Department. In a field that still is in crisis when it comes to participation by women, our Department had the most female faculty (four) in the School and five of my former doctoral students are women (four holding academic positions).*
- 2004-05 Chair, Assembly Series Committee
- *The series brings to campus world-class intellectuals, scientists, journalists, legal experts, politicians, etc., for a free weekly talk during the academic year. The free lectures are open to all members of the University community as well as the general the public. The speaker's list included Thomas Friedman, Robert F. Kennedy, Jr, Susan Sontag, Carlos Fuentes, and Cornel West.*
- 1997-11 Director and founder of the Mobile Computing Laboratory
- *MobiLab was one the early academic research laboratories dedicated to the emerging field of wireless communication and mobile computing.*
- 1990-97 Director and founder of the Computer Visualization Laboratory
- *The laboratory equipment included high-performance visualization hardware and a Panasonic broadcast quality production facility. It made possible rapid visualization of concurrent programs through the use of a novel technique called declarative visualization.*
- 1989-97 Chair, Doctoral Program Committee
- *My efforts, with support from my colleagues, led to adopting a more effective process of doctoral student performance monitoring and evaluation and to creating a culture of high research aspirations. Consequently, doctoral graduates are highly published and seek challenging research and academic positions.*

VISITING POSITIONS

- 2010 Visiting Scientist, University College London.
- 1999 Visiting Scientist, LORIA CNRS, Université Henri Poincaré, Nancy France.
- 1994 Guest Scientist, Siemens AG, Corporate Research and Development, Munich, Germany.

LOCAL COMMUNITY — St. Louis

- 2006-11 Information Technology Coalition, founding member of the Board of Directors.
- *Through my personal advocacy an organization that brought together CIOs, entrepreneurs, university presidents, academics, and others was formed with the goal to develop programs that will enable St. Louis to be the place where Information Technology achieves its full economic potential.*
- 2002-08 Emerging Technologies Advisory Board, Saint Louis Science Center.
- 1996-97 Technology Advisory Council, Saint Louis Science Center.
- *Working with one of the premier science centers in the nation, enabled me to contribute to public awareness of scientific and engineering research and to fostering unique outreach opportunities.*
- 1993 Founder of the Saint Louis area Software Process Improvement Network (SPIN) Chapter.

Honor Society Memberships, Professional Associations

Tau Beta Pi

Association for Computing Machinery (ACM)

Institute of Electrical and Electronics Engineers (IEEE) Computer Society.

Professional Service

Recognized as a leader within the software engineering community, I held key roles in a variety of conferences and workshops, delivered keynote addresses, acted as outside advisor for international projects, served as an associate editor, and acted as reviewer for a number of leading journals.

RECOGNITION

- 2022 SenSys 2022 — *Test of Time Award* for early efforts to introduce sensor networking technology into clinical practice.
- *Chipara, O., Lu, C., Bailey, T.C., and Roman, G.-C., "Reliable Clinical Monitoring using Wireless Sensor Networks: Experience in a Step-down Hospital Unit," in Proceedings of the ACM Conference on Embedded Networked Sensor Systems (SenSys'10), Zurich, Switzerland, November 2010, pp. 155-168.*

SERVICE OF DISTINCTION

- 2010 General Chair, *International Symposium on the Foundations of Software Engineering (FSE 2010)*, Santa Fe, New Mexico, USA, November 7-11, 2010.
- *As general chair for FSE 2010, my overarching goal was to hold an event that had a high intellectual impact, solid financial backing, and the capacity to influence government policies regarding chronic under-investments in software research and technology. An unprecedented level of corporate and government support (in excess of \$100,000) allowed me to restructure the conference in a fundamental way and to add a two-day working conference on the future of software research.*

- 2005 General Chair, *International Conference on Software Engineering (ICSE 2005)*, Saint Louis, Missouri, May 15-21, 2005.
- *I worked with the Governor's office, the Mayor's office, the Regional Commerce and Growth Association and others to secure Saint Louis as the host for ICSE 2005, a conference that had never been held in the Midwest before. My goal was to organize an event that was memorable and had a lasting impact on the host region. The result was a conference that excelled in all respects: an overall attendance reaching 1,100, corporate support in excess of \$200,000, a high quality program, superb organization, and strong local participation. Furthermore, the Information Technology Summit held in conjunction with the conference laid the foundation for the creation of a regional Information Technology Coalition.*

EDITORIAL RESPONSIBILITIES

- 2002-04 Member of the Editorial Board of the ACM Transactions on Software Engineering and Methodology.
- 2002 Roman, G.-C., and Murphy, A. L., Guest Editors, Special Issue on Software Engineering for Mobility, *Automated Software Engineering* 9, No. 2, Kluwer Academic Publishers, April 2002.
- 1998 Roman, G.-C., and Ghezzi, C., Guest Editors, Special Issue on Mobility and Network Aware Computing, *IEEE Transactions on Software Engineering* 24, No. 5, May 1998.
- 1993 Ghezzi, C., and Roman, G.-C., Guest Editors, Selected Papers of the Sixth International Workshop on Software Specification and Design, *Science of Computer Programming* 20, No. 1-2, April 1993.

CONFERENCE LEADERSHIP

- 2011 De Meuter, W., and Roman, G.-C., Program Co-Chairs, *International Conference on Coordination Models and Languages (Coordination 2011)*, Reykjavik, June 6-9, 2011.
- 2006 Ochoa, S. F., and Roman, G.-C., Program Co-Chairs, *International Workshop on Advanced Software Engineering (IWASE 2006)*, Santiago, Chile, August 25, 2006.
- 2003 Roman, G.-C., Vice Chair for Agents and Mobile Code, *23rd International Conference on Distributed Computing Systems (ICDCS)*, May 19-22, 2003.
- 2001 Roman, G.-C., and Picco, G. P., Co-Chairs, *Workshop on Software Engineering and Mobility*, organized in conjunction with *International Conference on Software Engineering (ICSE'01)*, Toronto, Canada, May 13-14, 2001.
- 2000 Porto, A., and Roman, G.-C., Program Co-Chairs, *International Conference on Coordination Models and Languages (Coordination 2000)*, Cyprus, September 11-13, 2000.
- 1998 Ghezzi, C., and Roman, G.-C., Co-Chairs, Workshop on Computing and Communication in the Presence of Mobility, organized in conjunction with International Conference on Software Engineering (ICSE'98), Kyoto, Japan, April 25, 1998.
- Roman, G.-C., Panel Chair, Computing and Communication in the Age of Mobility, organized in conjunction with International Conference on Software Engineering (ICSE'98), Kyoto, Japan, April 1998.
- 1997 Roman, G.-C., and Ghezzi, C., Co-Chairs, *Workshop on Mobility and Network Aware Computing*, organized in conjunction with *Sixth European Software Engineering Conference (ESEC)*, Zurich, Switzerland, September 26, 1997.
- 1991 Ghezzi, C., and Roman, G.-C., Program Co-Chairs, *Sixth International Workshop on Software Specification and Design*, 25-26 October 1991, Como, Italy.

CONFERENCE STEERING COMMITTEES

International Conference on Coordination Models and Languages
 International Conference on Software Engineering
 International Workshop on Software Specification and Design

PROGRAM COMMITTEES

IEEE Symposium on Visual Languages
 International Conference on Coordination Models and Languages
 International Conference on Data Engineering
 International Conference on Distributed Computing Systems
 International Conference on Information Processing in Sensor Networks
 International Conference on MOBILE Wireless MiddleWARE, Operating Systems, and Applications
 International Conference on Sensor Networks, Ubiquitous, and Trustworthy Computing
 International Conference on Software Engineering
 International ICDCS Workshop on Mobile Computing Middleware
 IEEE Real-Time Systems Symposium
 International Workshop on Formal Methods for Parallel Programming
 International Workshop on Advanced Software Engineering
 International Workshop on Engineering Mobile Service Oriented Systems (EMSOS)
 International Workshop on Foundations of Coordination Languages and Software Architectures
 International Workshop on Software Specification and Design
 International Workshop on Software Engineering for Large-Scale Multi-Agent Systems
 International Workshop on Connecting Software-Intensive Networked Systems in Today's Pervasive Digital Environment (CoPinE)
 Fundamental Approaches to Software Engineering
 SIGSOFT Symposium on the Foundations of Software Engineering
 Workshop on Reflective and Adaptive Middleware
 Workshop on Self-Healing Systems
 Workshop on Software Engineering for Pervasive Computing Applications, Systems, and Environments
 International Workshop on Software Architectures and Mobility (SAM)
 Workshop on Multi-Agent Systems and Software Architecture (MASSA)
 IEEE WETICE Workshop on Coordination Models and Applications (CoMA): Knowledge in Pervasive Environments

REVIEWER

National Science Foundation
 National Institutes of Health
 Major conferences and journals in the fields of software engineering, mobility, distributed computing, and visualization
 Research funding agencies in Europe and elsewhere

Subjects Taught

Classes I like to teach are progressive and exhibit conceptual integrity, i.e., a unifying theme or vision. I believe that interesting homework assignments and personal attention are the keys to a quality education. When first taught in the seventies, the programming systems and languages class anticipated the contents of modern language texts by almost a decade. The software engineering workshop was one of the first classes of its kind; it maintained its freshness and relevance because of its strong grounding in the realities of industrial software development. My contributions to the concurrency curriculum sought to bridge the gap between formal methods and current design practices and to introduce students to the emerging field of mobile computing and wireless communication.

Software engineering workshop

Mobile computing

Models of concurrency

Distributed algorithms

Concurrent algorithms and formal verification

Programming systems and languages

Programming language theory

Computer graphics

Compilers

Automata and formal languages

Introductory computer science

2002 European Educational Forum (EEF) International Summer School (Turku, Finland):
Mobile UNITY—Reasoning about Physical and Logical Mobility

2001 Winter School (Universidad de Buenos Aires, Argentina): Formal Reasoning about
Concurrent and Mobile Systems in UNITY and Mobile UNITY

Dissertations Supervised

Doctoral research is academic education at its very best. There are few more satisfying forms of teaching: a one-on-one apprenticeship that enhances knowledge of student and teacher alike; an intense effort motivated by a self-constructed vision; and a gradual refinement of taste and style in choosing problems and solution strategies. As chair of the Doctoral Program Committee, I was able to establish a culture in which every doctoral student has the opportunity to excel, understood the high expectations of our department, and made continuous progress toward completing the degree requirements. At the personal level, I focused my efforts on educating a new generation of graduate students likely to succeed in academia and top-ranked national research centers.

List of graduates and initial placement after graduation:

2010 Chipara, O., (Co-Advisor with: Chenyang Lu) *Towards Real-Time Wireless Sensor Networks*. (Postdoc, University of California, San Diego; assistant professor, University of Iowa, Iowa City, Iowa)

2009 Fok, C.-L., (Co-Advisor with: Chenyang Lu) *Adaptive Middleware for Ad Hoc and Wireless Sensor Networks*. (Postdoc, University of Texas, Austin)

2008 Sen, R., (Co-Advisor with: Chris Gill) *Supporting Collaborations Across Mobile Environments*. 2008 Sen, R., (Co-Advisor with: Chris Gill) *Supporting Collaborations Across Mobile Environments*. (Advisory Forensic Services, PricewaterhouseCoopers LLP, New York, New York)

- Bhattacharya, S., (Co-Advisor with: Chenyang Lu) *Achieving Application Quality of Service in Resource-Constrained Wireless Sensor Networks*. (Researcher at Intel India System Research Center, Bangalore, India)
- 2006 Payton, J., *A Query-Centric Perspective to Supporting the Development of Context-Aware Applications for Mobile Ad Hoc Networks*. (Assistant professor at University of North Carolina at Charlotte, Charlotte, North Carolina.)
- 2005 Handorean, R., *Context Aware Service Oriented Computing in Mobile Ad Hoc Networks*. (Software Engineer at Qualcomm, Boulder, Colorado.)
- 2004 Julien, C., *Supporting Context-Aware Application Development in Ad Hoc Mobile Networks*. (Assistant professor at University of Texas, Austin, Texas.)
- 2003 Huang, Q., (Co-Advisor with: Chenyang Lu) *Spatiotemporal Multicast and Partitionable Group Membership Service*. (Research scientist at Palo Alto Research Center (PARC), Palo Alto, California.)
- 2002 Tudoreanu, M.-E., (Co-Advisor with: E. Kraemer) *Economy of Interaction for Effective Program Visualizations*. (Assistant professor at University of Arkansas, Little Rock, Arkansas.)
- 2000 Hart, D., *Query-Based Visualization of Executing Distributed Computations*. (Assistant professor at University of Alabama, Huntsville, Alabama.)
- Murphy, A. L., *Rapid Development of Dependable Applications in Ad Hoc Mobility*. (Assistant professor at University of Rochester, Rochester, New York.)
- 1998 Picco, G. P., (Co-Advisor with: S. Gai and C. Ghezzi) *Understanding, Evaluating, Formalizing, and Exploiting Code Mobility*, Politecnico di Torino. (Visiting assistant professor at Washington University in Saint Louis; assistant professor at Politecnico di Milano, Italy.)
- 1997 McCann, P. J., *Reasoning About Program Interactions in the Presence of Mobility*. (Lucent Bell Laboratories Research, Naperville, Illinois.)
- 1995 Plun, J. Y., *Expressing Dynamic Interaction Patterns in Concurrent Programming*. (Postdoctoral fellow at Washington University in Saint Louis.)
- 1994 Wilcox, C. D., *Addressing Architectural and Mobility Considerations in the Formal Specification and Design of Concurrent Systems*. (Radworks Corp., San Antonio, Texas.)
- 1993 Cox, K. C., *Visualization of Concurrent Computations*. (AT&T Bell Laboratories Research, Naperville, Illinois.)
- 1992 Gamble, R. F., (Adviser: W. E. Ball) *Developing Reliable, Concurrent Rule-Based Programs*. (Assistant professor at University of Tulsa, Tulsa, Oklahoma.)
- 1989 Laine, A. F., *High-Speed Feature-Based Stereo Matching*. (Assistant professor at University of Florida, Gainesville, Florida.)
- Cunningham, H. C., *The Shared Dataspace Approach to Concurrent Computation: The Swarm Programming Model, Notation, and Logic*. (Assistant professor at University of Mississippi, Oxford, Mississippi.)

Research Support

Throughout my career I maintained a well-funded research group and associated laboratories. For much of the last decade and a half I dedicated myself to the study of mobile computing, with a special emphasis on the development of software systems and applications for mobile ad hoc wireless networks and wireless sensor networks. Within this area my group made a number of pioneering contributions including the introduction of coordination technology to ad hoc wireless networks, a formal model for the study and verification of mobile systems and protocols, and the first agent-based middleware for sensor networks.

- 2019 “CNS Core: Small: Collaborative Research: Context-Assisted Interactions in the Internet of Things,” NSF research grant. (CNS-A20-0086-001, Oct. 1 2019 – Sept. 30 2022, C. Julien (PI UT Austin) and G.-C. Roman (PI UNM), \$500,000)
- 2016 “Space Systems Software Assurance,” AFRL grant. (Mar. 2016 - Sept. 2016, G.-C. Roman, \$72,000)
- 2008 “Wireless Sensor Network Technology for Clinical Monitoring,” ICTS Novel Methodologies and Pilot Studies award under the NIH/NCRR (NIH RR024992-01) grant. (Feb. 2008 - Jan. 2009, C. Lu (PI), T. Bailey, and G.-C. Roman, \$80,000)
- “CSR-DMSS: A Substrate for Personalized Computing in the Real World,” NSF research grant. (CSR-0834755, Sept. 1 2008 – Aug. 31 2011, G.-C. Roman (PI) and C. Gill, \$360,000)
- “Wireless Communication Study,” Emerson unrestricted gift. (C. Lu and G.-C. Roman, \$30,000)
- 2007 “Washington University Institute of Clinical and Translational Sciences,” NIH/NCRR grant. (NIH RR024992-01, Sept. 2007 - May 2012, Kenneth Polanski (PI) et al, (Co-Director Novel Methodologies and Pilot Studies Program with 5% support), \$50,000,000)
- “Towards Cyber-Physical Computing at Scale: A Life-Size Experimental Facility for Applied Sensor Networks Research,” NSF instrumentation grant collaborative with UIUC and University of Nebraska-Lincoln. (CNS-0708460, Aug. 2007 - July. 2008, C. Lu (PI) and G.-C. Roman, \$400,000 with \$100,000 for Washington University)
- 2005 “Adaptive Systems for Collaboration in Multi-mode Mobile Environments,” NSF research grant. (IIS-0534699, Dec. 2005 - Nov. 2010, G.-C. Roman (PI) and C. Gill, \$754,000; additional REU funding of \$12,000)
- “NeTS-NOSS: Fluid Software Infrastructure for Wireless Sensor Networks,” NSF research grant. (CNS-0520220, Aug. 2005 - July 2009, G.-C. Roman (PI) and C. Lu, \$300,000)
- 2003 “Spatiotemporal Protocols and Analyses for Wireless Sensor Networks,” NSF Information Technology Research (ITR) award. (CCR-0325529, Aug. 2003 - Aug. 2006, C. Lu (PI) and G.-C. Roman, \$500,000)
- 2002 “A Logical Framework for Adaptive System Interoperability,” ONR MURI research contract managed as a subcontract with University of Illinois. The overall effort involves five related projects led by J. Meseguer and G. Agha at Univ. of Illinois Urbana-Champaign, C. Gunter at Univ. of Pennsylvania, G.-C. Roman at Washington Univ., and N. Venkatasubramanian at UC Irvine). (N00014-02-1-0715, June 2002 – April 2007, \$900,000)
- 2001 Ford Motor Company research partnership. (2001-2003, \$150,000)
- “Student Travel Support for the Software Engineering and Mobility Workshop,” NSF travel grant. The Workshop was organized in conjunction with *International Conference on Software Engineering (ICSE '01)*, Toronto, Canada, May 13-14, 2001. (CCR-0111878, \$9,750)
- 2000 Ford Motor Company research partnership. (\$25,000)
- 1999 “Rapid Development of Dependable Applications over Ad Hoc Networks,” NSF research grant. (CCR-9970939, July 1999 - June 2002, \$391,053)
- IBM Partnership Award. (July 1999 - June 2000, \$30,000)
- 1998 “Query-Based Visualization: Supporting the Monitoring of Large Distributed Systems,” Boeing Fellowship supporting D. Hart. (July 1998 - June 2000, approx. \$70,000)
- 1997 “Effective Visual Presentation of Computer Generated Information,” NSF instrumentation grant. (CDA-9616969, Feb. 1997 - Jan. 1998, G.-C. Roman (PI), P. M. Hubbard, E. T. Kraemer, and S. Suri, \$130,728)

- “Query-Based Visualization of Executing Distributed Computations,” NSF research grant. (CDA-9619831, Jul. 1997 - Jun. 2000, G.-C. Roman (PI) and E. T. Kraemer, \$262,000 basic funding; \$8,053 REU supplement)
- 1996 “Reasoning about Program Interactions in the Presence of Mobility,” NSF research grant. (CCR-9624815, Aug. 1996 - Jul. 1998, \$132,270)
- 1995 “Correctness per Construction,” Siemens AG, Munich, Germany. (Oct. 1995-Sept. 1996, \$23,000)
- 1994 “A Research Infrastructure for Fast Image and Visualization Distribution,” NSF grant to expand an ATM multimedia computer network to support interdisciplinary collaborative work. (CDA-9401159, Aug. 1994 - Jul. 1997, J. S. Turner (PI) and investigators M. A. Franklin, M. Miller, G. Parulkar, and G.-C. Roman, \$939,618)
- 1993 “Advanced Design Methods for Critical Components of Concurrent Systems,” NSF research grant. (CCR-9217751, Jul. 1993 - Dec. 1996, \$331,326)
- 1992 “Multimedia ATM Network for Computer and Communication Research,” NSF grant for the design and deployment of a multimedia computer network. (CDA-9214622, Sept. 1992 - Feb. 1996, J. S. Turner (PI) and co-principal investigators J. R. Cox, M. W. Dubetz, M. A. Franklin, and G.-C. Roman, \$250,000)
- 1991 “A Proof-based Declarative Approach to Visualizing Concurrent Computations,” NSF research grant. (CCR-9015677, Feb. 1991 - Jul. 1993, \$169,756)
- “Software Engineering,” unrestricted gift from Osaka Gas Co., Ltd. (\$20,000)
- “Visualization Support for Formal Methods,” NSF educational supplement. (CCR-9015677, Dec. 1991 - Jan. 1993, \$16,858)
- 1990 “Parallel Processing,” unrestricted gift from Texas Instruments. (\$5,000)
- “Visualization of Concurrent Computations,” DARPA/NASA Assistantship in Parallel Processing for K. C. Cox. (26947M, Jun. 1990 - May 1991, \$26,000)
- “Professional Video Production Support for a Visualization Laboratory,” equipment gift from Matsushita Electric Industrial Co., Ltd. (\$60,000)
- 1988 “Equipment in Support of Parallel Processing Research,” NSF grant for the purchase of a 64 node NCUBE-7 parallel computer. (CCR-8716462, Mar. 1988 - Aug. 1989, M. A. Franklin (PI), M. Miller, and G.-C. Roman, \$70,000)
- 1985 “Photo-interpretation Speed-up by Semi-automated Feature Detection,” DMA contract investigating the speed-up of photo interpretation by semi-automated feature detection. (DMA800-85-C-0010, Jan. 1985 - Sept. 1987, W. E. Ball and G.-C. Roman, \$482,659)
- 1983 “Long-Range Technological Impact on Computer-Aided Product Development at DMA,” DMA/RADC contract investigating the exploitation of current technology in the Geographic Data Processing area: technological trends, requirements specification/validation, system design methodologies, software development practices and facilities. (F30602-83-K-0065, Apr. 1983 - Jan. 1986, \$229,475)
- 1982 “Modern Programming Environment Assessment,” RADC/DMA contract focusing on issues related to the establishment of a DMA software development facility. (F30602-80-C-0284, Apr. 1982 - Sept. 1982, \$30,000)
- 1980 “Total System Design Methodology Assessment,” RADC/DMA contract concerned with (a) the nature of and strategies involved in the identification of the hardware/software mix that comprises a distributed system and (b) the establishment and evolution of system design facilities. (F30602-80-C-0284, Sept. 1980 - Apr. 1982, \$209,365)
- 1979 “Total System Development Framework,” RADC contract investigating the dynamics of hardware/software trade-offs in distributed systems design. (F30602-78-C-0148, May 1979 - Sept. 1979, \$15,000)

- 1977 “Software Engineering Workshop,” Monsanto Company contract for software systems design methodology development and training. (Oct. 1977 - May 1978, \$30,000)

Industrial Consulting

My career as a software engineering consultant has been a source of strength for my software engineering instructional program and a crusade for the introduction of modern software design methods into everyday industrial practice. The software engineering class I taught for twenty years or so, starting in the mid seventies, benefited greatly from being used in industry as well; many of the design techniques presented to the students were evaluated concurrently on industrial-grade projects. Because much of my consulting dealt with embedded systems, I have been exposed to industrial projects that go far beyond computer science and involve a wide range of engineering fields. Overall, my consulting activities gave me the unique opportunity to play a key role in upgrading the software development practices of major corporations.

- 2016-22 BlueHalo (which acquired Applied Technology Associates), Albuquerque, New Mexico—support for AFRL/RV software assurance initiative.
- 2016 SDC Shore Chan DePumpo LLP, Dallas, Texas—expert witness consulting.
- 2014 Emerson Electric, St. Louis, Missouri—project review.
- 2004-08 Emerson Electric, St. Louis, Missouri—software architecture for dependable systems.
- 2003 bioMérieux, St. Louis, Missouri—software development process evaluation.
- 2002 Corporate Express, St. Louis, Missouri—software engineering training.
- 1995-01 Emerson Electric, St. Louis, Missouri—design reviews, software engineering training, and software process improvement.
- 1994-95 In-Sink-Erator, a division of Emerson Electric, Racine, Wisconsin—object-oriented, dependable software design.
- 1987-90 Emerson Electric, St. Louis, Missouri—software engineering training program.
- 1985-86 General Dynamics, Fort Worth, Texas—SDI contract investigating high-payoff distributed system design tools.
- 1985 McDonnell Douglas Astronautics, St. Louis, Missouri—requirements and design specification methods for common Ada missile packages.
- 1984-86 General Dynamics, Fort Worth, Texas—DMA contract to establish a modern software development environment and the methodology required to use it effectively.
- 1983 Computer Services Corporation (CSK), Tokyo, Japan—Ada language and software engineering training.
- 1982-83 McDonnell Douglas Astronautics, St. Louis, Missouri—software engineering methodology support, development of Ada-based design language for embedded systems and instruction in the use of the language and associated methodology.
- 1982 General Dynamics, Fort Worth, Texas—Army contract for the development of an Ada-based system design methodology for real-time embedded systems.
- 1981 Defense Mapping Agency Aerospace Center, St. Louis, Missouri—software systems design methodology development and training.
- 1980 Defense and Space Systems Group of TRW, Redondo Beach, California—Air Force contract for the development of a hardware/software trade-offs methodology.

Invited Technical Talks

- Beijing University
Bell Research Laboratories

Emerson Electric
 Ford Research
 Fudan University
 Fundamental Approaches to Software Engineering (FASE 2004)—keynote speaker
 Hewlett-Packard Laboratories (Pisa, Italy)
 International Conference on Principles of Software Engineering (PRISE 2004)—invited speaker
 International Workshop on Abstract State Machines (ASM 2003)—keynote speaker
 International Workshop on Advanced Software Engineering (IWASE 2006)—keynote speaker
 International Workshop on Formal Methods for Parallel Programming (FMPPTA 2002)
 International Workshop on Software Engineering for Large-scale Multi-agent Systems (SELMAS 2004)—keynote speaker
 Massachusetts Institute of Technology
 Open University, UK
 Osaka Gas Information Systems Co.
 Politecnico di Milano
 Siemens AG (Munich, Germany)
 Software Productivity Consortium (*Distinguished Lecture Series*)
 SRI International
 Technical University of Berlin
 Telcordia (formerly Bellcore)
 U. S. Naval Postgraduate School
 University of California at Irvine (*Distinguished Lecture Series*)
 University of Illinois at Chicago
 University of Karlsruhe
 University College London
 University of Missouri at Rolla
 University of New Mexico
 University of Oxford
 University of Pennsylvania
 University of Pisa

Publications

High levels of research activity resulted in nearly 200 publications with an overall citation count that exceeds 3000 (Google Scholar), including numerous papers having citation counts in excess of 100. In the broadest sense, this body of work can be characterized as being concerned with the design of software instruments that enable rapid development of dependable software, particularly in novel settings such as the mobile and wireless domains. The research style has been one that focused on innovation and creative thinking, often opening entirely new research directions or identifying important paradigm shifts.

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