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Research Interests

Software systems, static and dynamic program analysis, software testing, software security, applications of AI to software engineering and vice versa.

Education

PhD Computer Science, August 1985. MS Computer Science, December 1980. Carnegie Mellon University, Pittsburgh PA. PhD Dissertation: *Semantics for Structure Editing Environments*, advisor Nico Habermann.

ScB Computer Science and Engineering, June 1979. Massachusetts Institute of Technology, Cambridge MA. ScB Dissertation: *Automatic Extension of an Augmented Transition Network Grammar for Morse Code Conversations*, advisor Al Vezza.

Professional Employment

September 1985 - present: Columbia University Department of Computer Science, New York NY. Professor, January 1998 - present. Associate Professor, January 1990 - December 1997. Tenure effective July 1992. Assistant Professor, September 1985 - December 1989.

August 2005 - August 2006 and June - August 2007: Columbia University Center for Computational Learning Systems, New York NY. Adjunct Senior Research Scientist.

July 2000 - August 2001: Activium Inc. (SDN startup), New York NY. Strategic Technology Research Advisor, full-time summers, consulting academic year.

May - July 2000: Telcordia Technologies Applied Research, Morristown NJ. Academic Visitor.

June - August 1990 and June - August 1988: International Business Machines Thomas J. Watson Research Center, Hawthorne NY. Academic Visitor.

June - August 1986: Carnegie Mellon University Software Engineering Institute, Pittsburgh PA. Visiting Computer Scientist.

September 1979 - July 1985: Carnegie Mellon University Department of Computer Science, Pittsburgh PA. Graduate Research Assistant.

January-October 1983: Mindbank Inc. (startup), Pittsburgh PA. Project Director, half-time.

June 1981 - November 1984: Siemens Corporate Research, Princeton NJ. Member of Technical Staff, full-time summers, consulting during academic years.

February 1978 - August 1979: Massachusetts Institute of Technology Laboratory for Computer Science, Cambridge MA. Division of Sponsored Research Staff Member, full-time June - August 1979, part-time (casual) February 1978 - May 1979.

Honors and Awards

ACM SIGSOFT Distinguished Paper Award for "CONCORD: Clone-aware Contrastive Learning for Source Code", by Yangruibo Ding, Saikat Chakraborty, Luca Buratti, Saurabh Pujar, Alessandro Morari, Gail Kaiser and Baishakhi Ray, *32nd ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA)*, July 2023,

Distinguished Reviewer Award for 2022 ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2022). Also invited to the 5-member (plus 2 PC chairs) selection committee for the ACM SIGSOFT Distinguished Paper Awards for ESEC/FSE 2022.

Best Overall Paper Nominee and Best Student Paper Nominee. "Integrating Parsons Puzzles with Scratch", by Jeff Bender, Bingpu Zhao, Lalitha Madduri, Alex Dziena, Alex Liebeskind and Gail Kaiser. *29th International Conference on Computers in Education (ICCE)*, Asia-Pacific Society for Computers in Education, November 2021.

ACM SIGSOFT Distinguished Paper Award for "Identifying Functionally Similar Code in Complex Codebases", by Fang-Hsiang Su, Jonathan Bell, Gail Kaiser, and Simha Sethumadhavan, *24th IEEE International Conference on Program Comprehension*, May 2016. This was one of two best paper awards from ICPC 2016.

People's Choice Award for Best Position Paper for"Challenges in Behavioral Code Clone Detection", by Fang-Hsiang Su, Jonathan Bell, and Gail Kaiser, *10th International Workshop on Software Clones*, March 2016.

ACM SIGSOFT Distinguished Paper Award, "Unit Test Virtualization with VMVM", by Jonathan Bell and Gail Kaiser. *36th International Conference on Software Engineering*, June 2014.

Invited Panelist on "*Future directions and open problems*" at the NSF and Microsoft sponsored *Future of Software Engineering Symposium*, July 2013. Video at http://research.microsoft.com/apps/video/default.aspx?id=199240 (the panel part starts at about 1:04 hours in).

Best Paper Award, "Application of Metamorphic Testing to Supervised Classifiers", by Xiaoyuan Xie, Joshua Ho, Christian Murphy, Gail Kaiser, Baowen Xu and Tsong Yueh Chen. *9th International Conference on Quality Software*, August 2009.

Best Student Paper Award, "Adaptive Internet Interactive Team Video", by Dan Phung, Giuseppe Valetto and Gail Kaiser. *4th International Conference on Web-based Learning*, August 2005.

Best Student Poster Award, "Extracting Content To Improve Accuracy for HTML Content Extraction", by Suhit Gupta, Gail Kaiser and Salvatore Stolfo, *14th World Wide Web Conference*, May 2005.

Invited Speaker (of 3), "Kinesthetics eXtreme: An External Infrastructure for Monitoring Distributed Legacy Systems", *5th Annual International Active Middleware Workshop* (aka *Autonomic Computing*

Workshop), June 2003.

Best Paper Finalist (of 5) and Best Student Paper Finalist (of 2), "DOM-Based Content Extraction of HTML Documents", by Suhit Gupta, Gail Kaiser, David Neistadt and Peter Grimm, *12th International World Wide Web Conference*, May 2003.

Invited Speaker, "Autonomizing Legacy Systems", *2002 IBM Almaden Institute Symposium on Autonomic Computing*, April 2002.

Keynote Address, "Marvelous Support for Semi-Structured Group Activities", *ACM Conference on Organizational Computing Systems*, November 1993.

Invited Speaker (of 3), "Rule-based Approaches to Software Process", *International Symposium on Logic Programming*, October 1993.

Vice-Chair for Operations, ACM Special Interest Group on Programming Languages (SIGPLAN), elected term 1991-1993.

ACM/SIGPLAN National Lecturer, 1989-1991.

Best Paper of Year, "Intelligent Assistance for Software Development and Maintenance", by Gail E. Kaiser, Peter H. Feiler and Steven S. Popovich, *IEEE Software*, 1988.

Presidential Young Investigator in Software Engineering and Software Systems (joint), National Science Foundation, 1988-1993.

Research Initiation Grant in Complex Information Systems (1 of 5), International Business Machines, 1988-1990.

Incentives for Excellence (faculty development award, 1 of 11), Digital Equipment Corporation, 1986-1989.

Graduate Fellowship, Fannie and John Hertz Foundation, 1980-1985.

Graduate Fellowship, National Science Foundation, 1980 (declined).

George E. Forsythe First Prize, "Automatic Extension of an ATN Knowledge Base", ACM Student Paper Competition (undergraduate), 1980-1981.

Computer Systems Prize (best undergraduate thesis in computer science), "Automatic Extension of an Augmented Transition Network Grammar for Morse Code Conversations", Massachusetts Institute of Technology Electrical Engineering and Computer Science Department, 1979.

Sigma Xi 1983. Tau Beta Pi 1979. Eta Kappa Nu 1978.

Grants and Contracts -- Government

NSF. SaTC: CORE: Medium: Cannot Trust Anything: A Tiny TCB Architecture for Secure Containers, CNS-2247370. PI, with Jason Nieh as co-PI. $1,200,000 for October 1, 2023 - September 30, 2027.

NSF. Collaborative Research: SHF: Medium: Learning Semantics of Code To Automate Software Assurance Tasks, CCF-2313055. With Wei Le, Iowa State University, Lead PI and Baishakhi Ray, Columbia PI, Gail Kaiser as co-PI. Columbia portion $666,000 for October 1, 2023 - September 30, 2027.

DARPA and NIWC Pacific (Defense Advanced Research Projects Agency and Naval Information Warfare Center Pacific) under Contract No. N66001-21-C-4018. V-SPELLS program, REFUEL: Verified Composition and Flattening of Unified Enclave Layers. Yale Prime. Jason Nieh Columbia PI, Gail Kaiser and Ronghui Gu co-PIs. Columbia portion $2,162,427 for April 1, 2021 - June 30, 2025.

NSF. SHF: Small: Preponderance of the Evidence for Behavioral Code Similarities, CCF-1815494. Sole PI. $496,571 for October 1, 2018 - September 30, 2022.

NSF. TWC: Medium: Toward Trustworthy Mutable Replay for Security Patches, CNS-1563555. PI, with Jason Nieh as co-PI. $1,200,000 for September 1, 2016 - August 31, 2021.

NSF. SaTC: CORE: EAGER: Finding Semantic Security Bugs with Pseudo-Oracle Testing, CNS-1842456. With Baishahki Ray (PI) and Suman Jana. $200,000 for October 1, 2018 - September 30, 2020.

GLCPC. Blue Waters Allocations for Broadening Participation in Petascale Parallel Computational Research: Materials Simulations in Geophysics. With Renata Wentzcovitch (PI) and Steve Nowick. May 1, 2018-April 30, 2019.

NSF. SHF: Medium: Overcoming the Intuition Wall: Automatic Graphical Analysis of Programs to Discover and Program New Computer Architectures, CCF-1302269. With Simha Sethumadhavan (PI) and Tony Jebara. $400,654 for September 1, 2013 - December 31, 2016.

NSF. SHF: Medium: Achieving Software Reliability without True Test Oracles, CCF-1161079. Sole PI. $894,582 for September 1, 2012 - August 31, 2016.

NIH. Training Program in Computational Biology, 2T32GM082797-06. PI: Barry Honig. July 1, 2013 - June 30, 2016.

NIH. National Center for the Multiscale Analysis of Genomic and Cellular Networks II (MAGNet II), U54 CA121852. PI: Andrea Califano. $18,709,230 for September 1, 2010 - July 31, 2015.

NSF. CSR: Medium: Guanyin: a Thousand hands with a Thousand eyes for Distributed Software Checking, CNS-0905246. With Junfeng Yang (PI) and Jason Nieh. $1,012,000 for September 1, 2009 - August 31, 2014.

NIH. Training Program in Computational Biology, 1T32GM082797-01. PI: Barry Honig. July 1, 2008 - June 30, 2013.

NSF. CSR-VCM: Autonomic Mechanisms for Reducing System Downtime due to Maintenance and Upgrades, CNS-0717544. With Jason Nieh (PI). $350,000 for August 1, 2007 - July 31, 2010.

New York State Office of Science, Technology and Academic Research, Center for Advanced Technology at Polytechnic University. Better Mutual Authentication. With Steven Bellovin (PI). $50,000 for September 1, 2006 - June 30, 2007. (Matching for FSTC industry grant.)

NSF. CT-T: Enabling Collaborative Self-healing Software Systems, CNS-0627473. With Angelos Keromytis (PI) and Salvatore Stolfo. $800,000 for September 1, 2006 - August 31, 2011.

NIH. MAGNet: A Center for the Multiscale Analysis of Genomic and Cellular Networks, 1 U54 CA121852-01. PI: Andrea Califano. $19,117,667 for September 26, 2005 - August 31, 2010.

NSF. ITR - (NHS) - (int/dmc): Secure Remote Computing Services, CNS-0426623. With Jason Nieh (PI) and Angelos Keromytis. $1,200,000 for September 1, 2004 - August 31, 2011. Broadening Participation in Research supplement, $133,565 for September 1, 2005 - August 31, 2011.

NSF. CISE Research Infrastructure: Pervasive Pixels, EIA-0202063. With Henning Schulzrinne (PI), Steven Feiner, Kathleen McKeown and John Kender. $1,485,098 for September 1, 2002 - August 31, 2008.

NSF. Smart Event Models and Architectures, CCR-0203876. Sole PI. $270,000 for September 1, 2002 - August 31, 2006.

NSF. Adaptive Internet Interactive Team Video, EIA-0071954. With John Kender (PI) and Jason Nieh. $1,589,998 for September 15, 2000 - August 31, 2004.

DARPA, monitored by Air Force Research Laboratory. Coping with Complexity: A standards-based kinesthetic approach to monitoring non-standard component-based systems. F30602-00-2-0611 (DARPA Order K503). Lead PI, with George T. Heineman of Worcester Polytechnic Institute (subcontractor). $940,000 for June 30, 2000 - December 31, 2003.

NSF. Component Technologies for Next-Generation Software Development, CCR-9970790. Sole PI. $225,000 for September 15, 1999-August 2003.

ONR. Survivable Enterprise Middleware, N000140110441. Sole PI. $255,443 for February 28, 2001 - February 27, 2002.

DARPA, monitored by Air Force Research Laboratory. A New Infrastructure for Evolutionary Design and Implementation. F30602-97-2-0022 (DARPA Order E101). Columbia PI. $1,349,090 for December 1996-May 2001.

DARPA, monitored by Air Force Rome Laboratory. Atlantis: An Open Architecture for Synergy of Process-Centered Environments and Computer-Supported Cooperative Work. F30602-94-C-0197 (ARPA Order B128). Columbia PI. $1,050,195 for June 1994-September 1997.

NSF. CISE Research Instrumentation, CDA-9529304. Semantics-based Prefetching for Mobile Computing. With Daniel Duchamp. $46,680 for equipment, February 1996-January 1997.

NSF. Components for Decentralized Process-Centered Environments, CCR-9301092. Sole PI. $217,000 for September 1993-August 1996.

NSF. Multi-Agent Rule-Based Development Environments, CCR-9106368. Sole PI. $236,334 for September 1991-August 1993.

NSF. Distributed Language-based Environments. CCR-9000930 (renewal). Sole PI. $99,990 for September 1990-August 1992. CCR-8802741. $146,330 for July 1988-June 1990.

NSF. CISE Research Instrumentation, CDA-8920080. Research in Software Engineering and Software Systems. With Daniel Duchamp. $44,097 for equipment, March 1990.

NSF. Presidential Young Investigator Award in Software Engineering and Software Systems, CCR-8858029. $312,000 for October 1988-September 1993.

NSF Engineering Research Center, Center for Telecommunications Research. Multimedia. PI: Tony Acampora. 1 month for February 1994-January 1995 and 2 GRAs for September 1994-January 1995. 1 month for February 1995-January 1996.

NSF Engineering Research Center for Telecommunications Research. Software for Telecommunications. 2 months and 4 GRAs per year November 1987-January 1989. 3 months and 4 GRAs for February 1989-January 1990. 3.5 months and 4 GRAs for February 1990-January 1991. 3 months, 3.5 GRAs and $17,500 for equipment for February 1991-January 1992. 1.5 months and 2 GRAs for February-July 1992. 2 GRAs for September 1992-May 1993.

New York State Science and Technology Foundation, Center for Advanced Technology -- High Performance Computing and Communications in Healthcare. Workflow Technology for Healthcare Delivery. $70,000 per year July 1994-June 1995 and July 1995-June 1996. $39,877 for July 1996-June 1997.

New York State Science and Technology Foundation, Center for Advanced Technology -- Computer & Information Systems. Focal Project: Extended Transaction Systems. With Calton Pu and Michael Foster, $147,567 for July 1987-June 1988. With Calton Pu, $195,545 for July 1988-June 1989. With Daniel Duchamp, $205,959 for July 1989-June 1990. As sole PI, $200,660 for July 1990-June 1991, $180,000 for July 1991-June 1992, $180,000 for July 1992-June 1993, 2 GRAs for July 1993-June 1994.

New York State Science and Technology Foundation, Center for Advanced Technology -- Computer & Information Systems. Seed Project. $10,000 for July 1986-June 1987. $20,000 for July 1987-June 1988.

Grants and Contracts -- Industry

AT&T Foundation. Special Purpose Grants in Science and Engineering. $25,000 for 1986-1987. $15,000 for 1987-1988. $20,000 per year for 1988-1989 and 1989-1990. $25,000 per year for 1990-1991, 1991-1992 and 1992-1993. $5,000 per year for 1993-1994 and 1994-1995.

Andersen Consulting. Grant. $50,000 for 1993-1994.

Bell Northern Research, Inc. Young Faculty Award (PYI matching). $37,500 for 1990-1991. $40,000 for 1991-1992. $25,000 for 1992-1993.

Bull HN Information Systems Inc. Grant. $25,000 for 1992-1993. $20,000 for 1993-1994. $20,000 additional for 1994.

Bull HN Information Systems Inc. Industrial Partners Program. $10,000 per year for October 1992-October 1993 and October 1993-October 1994.

Citibank Financial Markets Group. CAT matching. $28,923 for July 1989-June 1990. $14,461 for July 1990-December 1990.

Digital Equipment Corp. External Research Program (PYI matching). $45,750 in equipment, Fall 1990 to Spring 1991. $91,500 in equipment for June 1991-May 1993.

Digital Equipment Corp. Faculty Program: Incentives for Excellence (Young Faculty Award). $25,000 plus $35,000 in equipment per year for 1986-1987, 1987-1988 and 1988-1989.

Financial Services Technology Consortium. Better Mutual Authentication. With Steven Bellovin. $100,000 for September 2006-December 2007.

IBM. Joint Study in Autonomic Computing, Agreement No. W0143710. December 2004-December 2005.

IBM. Eclipse Innovation Award. $28,000 for 2003.

IBM. University Partnership Program Research Award. $40,000 plus equipment (Intellistation M Pro 3D WinNT workstation, retail $7524) for 1998-1999.

IBM. Wireless Network of Portable Electronic Notebooks. With Anthony Acampora (EE), Daniel Duchamp, Steven Feiner and Gerald Q. Maguire, Jr. $843,730 plus equipment valued at $176,565 for July 1989-December 1990.

IBM. Joint Study in Parallel Processing on Experimental Multiprocessor Workstation, Agreement No. 14640056. Renewals 1461056, 14642053, 14643053. With Daniel Duchamp and Calton Pu. Loaned multiprocessor valued at $130,000 for June 1989-December 1992, second loaned multiprocessor starting in Fall 1990.

IBM. Research Initiation Grant for Complex Information Systems. $98,000 for 1988. $100,000 per year for 1989 and 1990. Equipment for Research Initiation Grant. With Yechiam Yemini. $408,201 in hardware (8 RT workstations) and $21,922 in software in 1989.

IBM. Robotics and Manufacturing. With Peter Allen. $32,585 for August 1987-August 1988.

IBM Canada Ltd. Process Reuse Study consortium with McGill University, Carnegie Mellon University and the University of Maryland, adding University of Southern California in 1994. $25,000 per year for 1992, 1993 and 1994.

Lucent Technologies Foundation. Technical Special Purpose Grant. $20,000 for Fall 1996-Spring 1997.

Microsoft Research. Trustworthy Computing Curriculum. With Angelos Keromytis $50,000 for 2005.

Microsoft Research. Grant. $5,000 cash and $49,554 in-kind (hardware, software, training) for Spring 2002. $3,000 cash and $37,302 in-kind for Fall 2002. $20,000 cash and $3,276 hardware and software for 2003. $19,575 hardware and software for 2004.

NEC Computers. Equipment. May 2001.

Paramax Systems Corporation. Multi-User Knowledge Based Software Assistants. $28,750 for August 1992-August 1993.

Siemens Corporate Research. Grant. $25,000 for 1986-1987. $125,000 for 1987-1988. $25,000 per year for 1988-1989 and 1989-1990.

Siemens Corporate Research. Support for PhD thesis research. Loaned Perq 1A workstation with maintenance for 1982-1985.

SRA America, Inc. Grant. $40,000 for 1990-91. $42,000 for 1991-92. $20,000 for 1992-93. Full-time visiting scientist (Miki Hideyuki) sent at company's expense for 1991-93.

Sun Microsystems, Inc. Grant. $50,000 per 18 months (plus Network Software Environment license) for April 1988-September 1989 and October 1989-March 1991.

Sun Microsystems, Inc. Academic Excellent Grant. Sun Ultra 40 M2 Workstation valued at $4,730. June 2007.

Xerox Foundation. Young Faculty Award (PYI matching). $10,000 per year for 1988-1989, 1989-1990, and 1990-1991.

Articles in Journals

Ziyuan Zhong, Gail Kaiser and Baishakhi Ray. Neural Network Guided Evolutionary Fuzzing for Finding Traffic Violations of Autonomous Vehicles. *IEEE Transactions on Software Engineering (TSE)*, 49(4):1860-1875, April 2023. https://doi.org/10.1109/TSE.2022.3195640. (Also appeared at the *45th International Conference on Software Engineering (ICSE)* as a journal-first paper, Melbourne Australia, May 2023.)

Jeff Bender, Alex Dziena, Bingpu Zhao and Gail Kaiser. Integrating Parsons Puzzles within Scratch Enables Efficient Computational Thinking Learning. *Research and Practice in Technology Enhanced Learning (RPTEL)*, Asia-Pacific Society for Computers in Education (APSCE), 18(22), February 2023. https://doi.org/10.58459/rptel.2023.18022.

Anthony Saieva and Gail Kaiser. Update with Care: Testing Candidate Bug Fixes and Integrating Selective Updates through Binary Rewriting. *The Journal of Systems & Software (JSS)*, 191(111381), September 2022. https://doi.org/10.1016/j.jss.2022.111381.

Jonathan Bell, Eric Melski, Mohan Dattatreya and Gail E. Kaiser. Vroom: Faster Build Processes for Java. *IEEE Software*, 32(2):97-104, Mar/Apr 2015. https://doi.org/10.1109/MS.2015.32.

Jonathan Bell, Christian Murphy and Gail Kaiser. Metamorphic Runtime Checking of Applications Without Test Oracles. *Crosstalk the Journal of Defense Software Engineering*, 28(2):9-13, Mar/Apr 2015. Published by U.S. Air Force STSC in concert with Lumin Publishing. ISSN 2160-1577 (print); ISSN 2160-1593 (online). http://static1.1.sqspcdn.com/static/f/702523/25999119/1425257561223/201503-Bell.pdf.

Swapneel Sheth and Gail Kaiser. Towards using Cached Data Mining for Large Scale Recommender Systems. Recent Progress in Data Engineering and Internet Technology, Ford Lumban Gaol (ed.), *Lecture Notes in Electrical Engineering*, 156:349-357, Springer, Berlin, Heidelberg, 2013. http://dx.doi.org/10.1007/978-3-642-28807-4_49. (Originally appeared in *International Conference on Data Engineering and Internet Technology*, March 2011.)

Xiaoyuan Xie, Joshua W. K. Ho, Christian Murphy, Gail Kaiser, Baowen Xu and Tsong Yueh Chen. Testing and Validating Machine Learning Classifiers by Metamorphic Testing. *Journal of Systems and Software (JSS)*, Elsevier, 84(4):544-558, April 2011. https://doi.org/10.1016/j.jss.2010.11.920. (Solicited expansion of Application of Metamorphic Testing to Supervised Classifiers, *9th International Conference on Quality Software*, August 2009. 28% accepted.)

Huning Dai, Christian Murphy and Gail Kaiser. CONFU: Configuration Fuzzing Testing Framework for Software Vulnerability Detection. *International Journal of Secure Software Engineering*, IGI Publishing, 1(3):41-55, July-September 2010. http://doi.org/10.4018/jsse.2010070103. (Solicited expansion of Configuration Fuzzing for Software Vulnerability Detection, *4th International Workshop on Secure Software Engineering*, January 2010.)

Rean Griffith, Ritika Virmani and Gail Kaiser. The Role of Reliability, Availability and Serviceability (RAS) Models in the Design and Evaluation of Self-Healing Systems. *International Transactions on Systems Science and Applications*, 5(3):252-263, November 2009. https://academiccommons.columbia.edu/doi/10.7916/D8T44206. (Solicited from *3rd International Conference on Self-Organization and Autonomous Systems in Computing and Communications*, September 2007.)

Dan Phung, Giuseppe Valetto, Gail E. Kaiser, Tiecheng Liu and John R. Kender. Adaptive Synchronization of Semantically Compressed Instructional Videos for Collaborative Distance Learning. *International Journal of Distance Education Technologies*, IGI Global, 5(2):56-73. http://doi.org/10.4018/jdet.2007040105. (Also published as Dan Phung, Giuseppe Valetto, Gail E. Kaiser, Tiecheng Liu and John R. Kender. Adaptive Synchronization of Semantically Compressed Instructional Videos for Collaborative Distance Learning. *Methods and Applications for Advancing Distance Education Technologies: International Issues and Solutions*, IGI Global, chapter 6, pages 72-86, 2009, http://doi.org/10.1145/3355369.3355585)

Janak Parekh, Gail Kaiser, Philip Gross and Giuseppe Valetto. Retrofitting Autonomic Capabilities onto Legacy Systems. *Journal of Cluster Computing*, Kluwer, 9(2):141-159, April 2006. https://doi.org/10.1007/s10586-006-7560-6.

Yixin Diao, Joseph L. Hellerstein, Sujay Parekh, Rean Griffith, Gail Kaiser and Dan Phung. A Control Theory Foundation for Self-Managing Computing Systems. *IEEE Journal on Selected Areas in Communications*, 23(12):2213-2222, December 2005. https://doi.org/10.1109/JSAC.2005.857206.

Michael F. Chiang, Roy G. Cole, Suhit Gupta, Gail E. Kaiser and Justin B. Starren. Computer and World Wide Web Accessibility by Visually Disabled Patients: Problems and Solutions. *Survey of Ophthalmology*, Elsevier, 50(4):394-405, July-August 2005. https://doi.org/10.1016/j.survophthal.2005.04.004.

Suhit Gupta, Gail E. Kaiser, Peter Grimm, Michael F. Chiang, and Justin Starren. Automating Content Extraction of HTML Documents. *World Wide Web*, Kluwer, 8(2):179-224, June 2005. https://link.springer.com/article/10.1007/s11280-004-4873-3.

D. Wang, M. Peleg, D. Bu, M. Cantor, G, Landesberg, E Lunenfeld, S.W. Tu, G.E. Kaiser, G. Hripcsak, V.L. Patel and E.H. Shortliffe. GESDOR - a generic execution model for sharing of computer-interpretable clinical practice guidelines. *Journal of the American Medical Informatics Association*, 2003 AMIA Annual Symposium supplement, October 2003. https://pubmed.ncbi.nlm.nih.gov/14728262/ .

Wenke Lee and Gail E. Kaiser. Interfacing Oz with the PCTE OMS: A Case Study of Integrating a Legacy System with a Standard Object Management System. *Journal of Systems Integration*, Kluwer, 9(4):329-358, December 1999. https://doi.org/10.1023/A:1008450004443 .

Jingshuang J. Yang and Gail E. Kaiser. JPernLite: Extensible Transaction Services for WWW. *IEEE Transactions on Knowledge and Data Engineering*, 11(4):639-657, Jul/Aug 1999. https://doi.org/10.1109/69.790823 .

Gail E. Kaiser, Stephen E. Dossick, Wenyu Jiang, Jack Jingshuang Yang and Sonny Xi Ye. WWW-based Collaboration Environments with Distributed Tool Services. *World Wide Web*, Baltzer Science Publishers, 1:3-25, January 1998. https://doi.org/10.1023/A:1019291009758.

Israel Z. Ben-Shaul and Gail E. Kaiser. Federating Process-Centered Environments: the Oz Experience. *Journal of Automated Software Engineering*, Kluwer, 5(1):97-132, January 1998. https://doi.org/10.1007/978-1-4615-5441-7_5. (The issue was reprinted as a book, Elisabetta Di Nitto and Alfonso Fuggetta (eds.), *Process Technology*, Kluwer, 1997.)

Wenke Lee, Gail E. Kaiser, Paul D. Clayton, and Eric H. Sherman. OzCare: A Workflow Automation System for Care Plans. *Journal of the American Medical Informatics Association,* 1996 AMIA Annual Fall Symposium supplement, Hanley & Belfus, Inc., October 1996, pp. 577-581. https://pubmed.ncbi.nlm.nih.gov/8947732/ .

Giuseppe Valetto and Gail E. Kaiser. Enveloping Sophisticated Tools into Process-Centered Environments. *Journal of Automated Software Engineering*, Kluwer, 3:309-345, 1996. https://doi.org/10.1007/BF00132571 .

Jack Jingshuang Yang and Gail E. Kaiser. An Architecture for Integrating OODBs with WWW. *Computer Networks and ISDN Systems, The International Journal of Computer and Telecommunications Networking*, 28(7-11):1243-1254, Elsevier Science B.V., May 1996. https://doi.org/10.1016/0169-7552(96)00046-3. (Special issue on *5th International World Wide Web Conference*, 25% accepted.)

Stephen E. Dossick and Gail E. Kaiser. WWW Access to Legacy Client/Server Applications. *Computer Networks and ISDN Systems, The International Journal of Computer and Telecommunications Networking*, 28(7-11):931-940, Elsevier Science B.V., May 1996. https://doi.org/10.1016/0169-7552(96)00023-2. (Special issue on *5th International World Wide Web Conference*, 25% accepted.)

Calton Pu, Wenwey Hseush, Gail E. Kaiser, Kun-Lung Wu and Philip S. Yu. Divergence Control for Distributed Database Systems. *Distributed and Parallel Databases*, 3(1):85-109, January 1995.

https://doi.org/10.1007/BF01263658 .

Josephine Micallef and Gail E. Kaiser. Extending Attribute Grammars to Support Programming-in-the-Large. *ACM Transactions on Programming Languages and Systems (TOPLAS)*, 16(5):1572-1612, September 1994. https://doi.org/10.1145/186025.186091.

G.T. Heineman, J.E. Botsford, G. Caldiera, G.E. Kaiser, M.I. Kellner and N.H. Madhavji. Emerging technologies that support a software process life cycle. *IBM Systems Journal*, 33(3):501-529, 1994. https://doi.org/10.1147/sj.333.0501 .

Israel Z. Ben-Shaul, Gail E. Kaiser and George T. Heineman. An Architecture for Multi-User Software Development Environments. *Computing Systems, The Journal of the USENIX Association*, 6(2):65-103, University of California Press, Spring 1993. https://www.usenix.org/legacy/publications/compsystems/1993/spr_benshaul.pdf.

Josephine Micallef and Gail E. Kaiser. Support Algorithms for Incremental Attribute Evaluation of Asynchronous Subtree Replacements. *IEEE Transactions on Software Engineering (TSE)*, 19(3):231-252, March 1993. https://doi.org/10.1109/32.221136 .

Gail E. Kaiser and Simon M. Kaplan. Parallel and Distributed Incremental Attribute Evaluation Algorithms for Multi-User Software Development Environments. *ACM Transactions on Software Engineering and Methodology (TOSEM)*, 2(1)47-92, January 1993. http://doi.acm.org/10.1145/151299.151312.

Steven S. Popovich and Gail E. Kaiser. An Architectural Survey of Object Management Systems. *International Journal of Intelligent & Cooperative Information Systems*, World Scientific, 1(3&4):515-577, December 1992. https://doi.org/10.1142/S0218215792000143 .

George T. Heineman, Gail E. Kaiser, Naser S. Barghouti and Israel Z. Ben-Shaul. Rule Chaining in Marvel: Dynamic Binding of Parameters. *IEEE Expert*, 7(6):26-32, December 1992. https://doi.org/10.1109/64.180406 .

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Wenyu Jiang, Gail E. Kaiser, Jack Jingshuang Yang and Stephen E. Dossick. WebCity: A WWW-based Hypermedia Environment for Software Development. Poster paper in *7th Workshop on Information Technologies and Systems*, December 1997, pp. 241-245.

Peyman Oreizy and Gail Kaiser. Collaborative Work: The Web as Enabling Technology for Software Development and Distribution. Column in *IEEE Internet Computing*, 1(6):84-87, November/December 1997.

Stephen E. Dossick and Gail Kaiser. Collaborative Work: Tool Services for Intranets. Column in *IEEE Internet Computing*, 1(5):80-81, September/October 1997.

Roy T. Fielding and Gail Kaiser. Collaborative Work: The Apache HTTP Server Project. Column in *IEEE Internet Computing*, 1(4):88-90, July/August 1997. https://ieeexplore.ieee.org/document/612229.

Gail E. Kaiser, Stephen E. Dossick, Wenyu Jiang and Jack J. Yang. An Open Hypertext Collaboration Environment for the World Wide Web and Other Distributed Computing Infrastructures. Position paper in Uffe K. Wiil (ed.), *3rd Workshop on Open Hypermedia Systems*, April 1997, pp. 86-92.

Gail Kaiser and Jim Whitehead. Collaborative Work: Distributed Authoring and Versioning. Column in *IEEE Internet Computing*, 1(2):76-77, March/April 1997.

Gail E. Kaiser, George T. Heineman, Peter D. Skopp and Jack J. Yang. On the Yellow Brick Road to Component-based Product Lines. Position paper in Barry Boehm (ed.), *10th International Software Process Workshop: Process Support of Software Product Lines*, June 1996.

Gail E. Kaiser and Wenke Lee. Pay No Attention to the Man Behind the Curtain. Position paper in *NSF Workshop on Workflow and Process Automation in Information Systems: State-of-the-Art and Future Directions*, May 1996, pp. 46-52.

Giuseppe Valetto and Gail E. Kaiser. Enveloping ``Persistent'' Tools for a Process-Centered Environment. Position paper in *4th European Workshop on Software Process Technology*, Wilhelm Schafer (ed.), Lecture Notes in Computer Science 913, Springer-Verlag, April 1995, pp. 200-204.

Gail E. Kaiser and Simon M. Kaplan. CSCW and Software Process. Session summary in *Ninth International Software Process Workshop: The Role of Humans in the Process*, October 1994, pp. 9-11.

Andrew Z. Tong and Gail E. Kaiser. Reducing the Technical Overhead of Software Reuse. Position paper in *6th Workshop on Software Reuse*, November 1993.

Gail E. Kaiser. MARVEL 3.1: A Multi-User Software Development Environment. Invited talk abstract in *International Symposium on Logic Programming*, October 1993, pp. 36-39.

Shyhtsun F. Wu and Gail E. Kaiser. Shared Memory vs. Message Passing in the Real-Time Producers/Consumers Problem. Short paper in *IEEE Workshop on Parallel and Distributed Real-Time Systems*, April 1993, p. 257.

Gail E. Kaiser and Israel Z. Ben-Shaul. Process Evolution in the Marvel Environment. Position paper in *8th International Software Process Workshop: State of the Practice in Process Technology*, March 1993, pp. 104-106.

Webb Stacy, Richard Helm, Gail E. Kaiser and Bertrand Meyer. Ensuring Semantic Integrity of Reusable Objects. Panel statement in *Conference on Object-Oriented Programming Systems, Languages, and Applications*, October 1992, pp. 298-302. https://doi.org/10.1145/141937.141961

James Lee, Wenwey Hseush, Erik Hilsdale and Gail E. Kaiser. Dynamic Orthogonal Composition in Meld. Short paper presented and distributed at *2nd Workshop on Objects in Large Distributed Applications*, October 1992.

Israel Z. Ben-Shaul, Gail E. Kaiser and George T. Heineman. Support for Concurrency in a Componentized SEE Architecture. Position paper presented and distributed at *Process-Sensitive SEE Architectures Workshop*, September 1992.

Gail E. Kaiser. We Need To Measure The Quality Of Our Work. Abstract in Walter F. Tichy, Nico Habermann and Lutz Prechelt (editors, *Future Directions in Software Engineering*, February 1992. In *ACM Software Engineering Notes*, 18(1):37, January 1993.

Karen E. Huff and Gail E. Kaiser. Change in the Software Process. Session summary in *7th International Software Process Workshop: Communication and Coordination in the Software Process*, October 1991, pp. 10-13. https://doi.org/10.1109/ISPW.1991.637511

Gail E. Kaiser. A Rule-based Process Server Component for Constructing Rule-based Development Environments. Position paper in *7th International Software Process Workshop: Communication and Coordination in the Software Process*, October 1991, pp. 76-78. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=c5fe4e6781c758eae24937eff8953619987809b6

Michael Lowry, Gail Kaiser, Dorothy Setliffe and David Steier. Knowledge-Based Design Environments. Panel statement in *6th Knowledge-Based Software Engineering Conference (KBSE)*, September 1991, pp. 239-244. https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=638043

Gail E. Kaiser. Open Object-Oriented Database Requirements for Extended Transactions. Position paper in *DARPA Open Object-Oriented Database Workshop II*, September 1991.

Gail E. Kaiser. Marvel's Activity-Centered View of Configuration Management. Position paper in *The International Workshop on Software Configuration Management Position Papers*, June 1991, pp. 51-53.

Gail E. Kaiser. Open Object-Oriented Database Support for Multi-User Process-Oriented Environments. Position paper in *DARPA Open Object-Oriented Database Workshop I*, March 1991.

Naser S. Barghouti and Gail E. Kaiser. MARVEL 2.6 A Unix-Based Software Development Environment Kernel. Position paper in *International Workshop on UNIX-Based Software Development Environments*, January 1991.

Steven S. Popovich, Gail E. Kaiser and Shyhtsun F. Wu. Melding Transactions and Objects. Position paper in *ECOOP-OOPSLA Workshop on Object-Based Concurrent Programming*, special issue of *OOPS Messenger*, 2(2):94-98, April 1991. https://doi.org/10.1145/127056.127093

Naser S. Barghouti and Gail E. Kaiser. Concurrency Control in Multi-Agent Object-Based Development Environments. Position paper in *Workshop on Transactions and Objects*, October 1990, pp. 21-25.

Israel Z. Ben-Shaul, Gail E. Kaiser and Naser S. Barghouti. An Object-Oriented Framework for Rule-Based Development Environments. Position paper in *ECOOP/OOPSLA '90 Workshop on Object-Oriented Program Development Environments*, October 1990.

Gail E. Kaiser, Israel Z. Ben-Shaul and Naser S. Barghouti. Preliminary Design of an Object Management System for Multi-User Marvel. Position paper in *6th International Software Process Workshop (ISPW): Experience with Software Process Models*, October 1990, pp. 121-123. https://doi.org/10.1109/ISPW.1990.659588

Simon M. Kaplan, Anthony Finkelstein, Gail Kaiser, Kevin Ryan and Wilhelm Schafer. Interactively Supporting the Software Process. Panel statement in *IFIP TC 13 3rd International Conference on Human-Computer Interaction -- INTERACT '90*, D. Diaper, D. Gilmore, G. Cockton and B. Shackel (eds.), North-Holland, August 1990, pp. 1047-1049. https://dl.acm.org/doi/10.5555/647402.725748

Josephine Micallef, Gail E. Kaiser and Dewayne E. Perry. SETA1 Working Group on Ada Libraries, Configuration Management, and Version Control. Working group report in *1st Symposium on Environments and Tools for Ada*, special issue of *Ada Letters*, 11(3):29-31, Spring 1991. https://doi.org/10.1145/112629.112634

Gail E. Kaiser. Extended Transaction Models. Introduction to minitrack in *23rd Hawaii International Conference on System Sciences (HICSS)*, January 1990, vol. II, p. 471.

Gail E. Kaiser. Modeling Configurations as Transactions. Position paper in *2nd International Workshop on Software Configuration Management*, special issue of *Software Engineering Notes*, 17(7):129-132, November 1989.

Gail E. Kaiser. Mechanisms Session Report. Workshop session report in *5th International Software Process Workshop (ISPW): Experience with Software Process Models*, October 1989, pp. 13-15. https://dl.acm.org/doi/abs/10.5555/317498.317688

Gail E. Kaiser. Experience with Marvel. Position paper in *5th International Software Process Workshop (ISPW): Experience with Software Process Models*, October 1989, p. 82-84.

https://doi.org/10.1109/ISPW.1989.690427

Michael H. Sokolsky and Gail E. Kaiser. Experiments with Rule Based Process Modeling in an SDE. Position paper in *Software Engineering Environments International Workshop on Environments*, Fred Long (ed.), Lecture Notes in Computer Science 467, Springer-Verlag, September 1989, pp. 107-114. https://doi.org/10.1007/3-540-53452-0_35

Gail E. Kaiser. Constructing Enactable Models. Workshop session report in *4th International Software Process Workshop (ISPW): Representing and Enacting the Software Process*, special issue of *Software Engineering Notes*, 14(4):15-16, June 1989.

Gail E. Kaiser. Rule-Based Modeling of the Software Development Process. Position paper in *4th International Software Process Workshop: Representing and Enacting the Software Process*, special issue of *ACM SIGSOFT Software Engineering Notes*, 14(4):84-86, June 1989. https://doi.org/10.1145/75110.75123

Gail E. Kaiser. Object-Based Concurrency. Position paper distributed at *ECOOP '89 Workshop on Object-Based Concurrent Programming*, July 1989.

Gail E. Kaiser. MARVELous Programming Environments. Public relations article in *Columbia Engineering Research*, Number 38, May 1989.

Gail E. Kaiser. Transactions for Concurrent Object-Oriented Programming Systems. Position paper in *ACM SIGPLAN Workshop on Object-Based Concurrent Programming*, special issue of *SIGPLAN Notices*, 24(4):120-122, April 1989. https://doi.org/10.1145/67387.67424

Gail E. Kaiser. Concurrent Meld. Position paper in *ACM SIGPLAN Workshop on Object-Based Concurrent Programming*, special issue of *SIGPLAN Notices*, 24(4):136-138, April 1989. https://doi.org/10.1145/67386.67419

Gail E. Kaiser. Marvel Software Development Environments. Position paper in *Working Notes AAAI Spring Symposium Series Artificial Intelligence and Software Engineering*, March 1989, pp. 40-42.

Gail E. Kaiser. Research in Software CAD Databases. Position paper in *1989 ACM SIGMOD Workshop on Software CAD Databases*, February 1989, pp. 67-69.

Gail E. Kaiser. Concurrent Meld. Full paper presented and distributed at *1988 ACM SIGPLAN Workshop on Object-Based Concurrent Programming*, September 1988. https://doi.org/10.1145/67386.67419

Gail Kaiser. Position paper in *ISF Architecture: Report on an International Workshop*, Alvey Information Systems Factory Study, January 1988, pp. 4-5.

Gail E. Kaiser. Use of AI Techniques for Software Design and Implementation. Introduction to minitrack in *21st Hawaii International Conference on System Sciences (HICSS)*, January 1988, volume II, p. 11. https://doi.org/10.7916/D8FN1FC9

Peter H. Feiler and Gail E. Kaiser. Intelligent Assistance in Software Development Environments. In *Annual Technical Review 1987*, Carnegie Mellon University, Software Engineering Institute, 1987, pp. 43-56.

Gail E. Kaiser. *Semantics for Structure Editing Environments*. PhD Thesis, Carnegie Mellon University, Department of Computer Science CMU-CS-85-131, May 1985.

David Notkin, Nico Habermann, Robert Ellison, Gail Kaiser and David Garlan. Letter to the Editor. *SIGPLAN Notices*, 18(4):7-12, April 1983.

Gail E. Kaiser, *Automatic Extension of an Augmented Transition Network Grammar for Morse Code Conversations*. Revision of ScB Thesis, Massachusetts Institute of Technology, Laboratory for Computer Science TR-233, April 1980. https://archive.org/details/DTIC_ADA084411.

Albert Vezza, P. David Lebling, Edward H. Black, Timothy A. Anderson, John F. Haverty, David Sherry and Gail E. Kaiser. Machine Recognition and Understanding of Manual Morse. In *Distributed Sensor Nets*, DARPA/ISTO Workshop, December 1978, pp. 125-136.

Invited Talks (selected)

2013: *Testing 1...2...3...*, CS Distinguished Lecture, University of Southern California, Los Angeles CA,

2004: *Self-Management of Complex Legacy Systems and Systems of Systems*, Technology Transfer Institute Vanguard conference on "The Challenge of Complexity", Los Angeles CA; *An External Infrastructure Approach to Autonomic Computing*, IBM T.J. Watson Research, Hawthorne NY.

2003: *Kinesthetics eXtreme: An External Infrastructure for Monitoring Distributed Legacy Systems*, 5th Annual International Active Middleware Workshop (aka Autonomic Computing Workshop), Seattle WA.

2002: *Autonomizing Legacy Systems*, 2002 IBM Almaden Institute Symposium on Autonomic Computing, San Jose CA.

2001: *A Mobile Agent Approach to Process-based Dynamic Adaptation of Complex Software Systems*, Naval Research Laboratory, Washington DC.

1999: *Component Technologies and Frameworks for Software Engineering Teams*, 11th Annual Software Technology Conference, Salt Lake City UT; *From Oz to TreatyMaker: An International Alliance Metaphor for Multi-Organization Workflows*, Workshop on Cross-Organisational Workflow Management and Co-ordination, San Francisco CA.

1998: *Component Technologies for Next-Generation Software Development Environments*, Software Productivity Consortium, Herndon, VA.

1996: *Pay No Attention to the Man Behind the Curtain*, NSF Workshop on Workflow and Process Automation in Information Systems: State-of-the-Art and Future Directions, Athens GA.

1994: *Oz Process-Centered Environment and CSCW*, CSCW Workshop on Relationships between CSCW and Software Process, Chapel Hill NC.

1993: *Marvelous Support for Semi-Structured Group Activities*, ACM Conference on Organizational Computing Systems, Milpitas CA (keynote address); *Rule-based Approaches to Software Process*, International Symposium on Logic Programming, Vancouver British Columbia, Canada (keynote address); *Cooperative Transactions for Engineering Environments*, MIT Industrial Liaison Program Symposium on Collaborative Engineering, Cambridge MA.

1992: *The Wizardry of Oz: Componentizing Marvel*, 4th International Symposium on Future Software Environments, Sydney, Australia.

1991: *MARVEL 3.0 A Unix-Based Software Development Environment Kernel*, Soviet Unix Users Group Workshop on Unix and Applications, Moscow, Russia (USSR).

1990: *Cooperative Transactions for Software Development Environments*, 2nd International Symposium on Future Software Environments, Boulder CO; *Change Propagation for Multi-User, Distributed Software*

Development Environments, National Science Foundation, Washington DC.

1989: *Software Engineering Research at Columbia University*, Syracuse University CASE Center Winter Conference, Syracuse NY.

1988: *Marvel: An Expert System for Software Design and Development*, Joint Statistical Meetings, New Orleans LA; *Constructing Enactable Models*, 4th International Software Process Workshop, Devon, United Kingdom.

Invited Panels

2013: *Future directions and open problems*, Future of Software Engineering symposium (sponsored by NSF and Microsoft Research), Microsoft Commons, Redmond WA. Video at http://research.microsoft.com/apps/video/default.aspx?id=199240 (the panel part starts at about 1:04 hours in).

2004: *OSS [Operations Support Systems] Re-systemization - Issues and Challenges*, Applied Research 3rd Quarter Review, Telcordia, Piscataway NJ.

2003: *Autonomic Computing* briefing of the Foresight and Governance Project, Woodrow Wilson International Center for Scholars, Washington DC.

1998: *What do we really need: More adaptive workflows, or less prescriptive process models?*, Adaptive Workflow Workshop, Seattle, WA.

1992: *Ensuring Semantic Integrity of Reusable Objects*, Conference on Object-Oriented Programming Languages, Applications and Systems, Vancouver BC, Canada; *Software Process and Knowledge-Based Tools*, 7th Knowledge-Based Software Engineering Conference, McLean VA; *Processes in Large Software Projects*, IBM Worldwide Software Development Conference on Quality Process Improvements, Toronto ON, Canada.

1991: *An Analysis of the Strengths and Weaknesses of Process Description Formalisms*, 7th International Software Process Workshop, Yountville CA; *Ramping Up: From Software Life Cycle to Knowledge Life Cycle*, 6th Knowledge-Based Software Engineering Conference, Syracuse NY.

1990: *Application of Process Models: how can rigorous software process models be beneficially applied?*, Software Process Symposium, Washington DC; *Interactively Supporting the Software Process*, IFIP TC 13 3rd International Conference on Human-Computer Interaction -- INTERACT '90, Cambridge, United Kingdom.

1989: *Database Support for Software Development Environments: Report from the 1989 Software CAD Database Workshop*, Federal CASE Conference, Gaithersburg MD.

1988: *Languages and Models for Concurrent Object-Based Programming*, Workshop on Object-Based Concurrent Programming, San Diego CA; *Object-Oriented Programming*, 21st Hawaii International Conference on System Sciences, Kona HI.

Journal Editorships

Editorial Boards: *World Wide Web: Internet and Web Information Systems*, Kluwer, 1998-2004 (previously *World Wide Web*, Baltzer Science Publishers); *Software Process Improvement and Practice*, Wiley & Sons, Ltd., 1996-2003; *IEEE Internet Computing*, 1996-2001; *ACM Transactions on Software Engineering and Methodology*, 1989-1998; *International Journal of Intelligent & Cooperative Information Systems*, World Scientific, 1991-92.

Misc: Guest Editor, with Frank Maurer, special issue on Software Engineering over the Internet, *IEEE Internet Computing*, Sept/Oct 1998; ACM Press Systems Editor, 1988-1993.

Program Committees

2025: International Conference on Software Engineering (ICSE).

2024: Programming Language Design and Implementation (PLDI); International Conference on Software Engineering (ICSE); ACM International Conference on the Foundations of Software Engineering (FSE); IEEE/ACM International Conference on Automated Software Engineering (ASE).

2023: ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE).

2022: OOPSLA (part of SPLASH, the ACM SIGPLAN Conference on Systems, Programming, Languages and Applications: Software for Humanity); ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), with Distinguished Reviewer Award for 2022 ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2022) and invited to the 5-member (plus 2 PC chairs) selection committee for the ACM SIGSOFT Distinguished Paper Awards for ESEC/FSE 2022; International Conference on Program Comprehension (ICPC); 1st ACM/IEEE Conference on AI Engineering - Software Engineering for AI (CAIN).

2021: ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI).

2020: International Conference on Software Engineering (ICSE) Reliable Rapid Response Reviewer; ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI) External Review Committee; ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE).

2019: OOPSLA (part of SPLASH, the ACM SIGPLAN Conference on Systems, Programming, Languages and Applications: Software for Humanity); Late Breaking Results track at IEEE/ACM International Conference on Automated Software Engineering (ASE-LBR); International Workshop on Metamorphic Testing (MET).

2018: **Co-Chair** for New Ideas and Emerging Results Track at the ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE-NIER); 3rd International Workshop on Metamorphic Testing (MET).

2017: Onward! (part of SPLASH, the ACM SIGPLAN Conference on Systems, Programming, Languages and Applications: Software for Humanity); 2nd International Workshop on Metamorphic Testing (MET); 2nd Annual IEEE International Workshop on Cyber Resilience Economics (CRE).

2016: Visions and Reflections (VaR) Track at the ACM SIGSOFT International Symposium on the Foundations of Software Engineering (FSE); Onward! (part of SPLASH, the ACM SIGPLAN Conference on Systems, Programming, Languages and Applications: Software for Humanity); 5th International Workshop on Games and Software Engineering (GAS); 1st International Workshop on Metamorphic Testing (MET); 1st IEEE International Workshop on Cyber Resilience Economics (CRE); 8th International Workshop on Social Software Engineering (SSE).

2015: OOPSLA (part of SPLASH, the ACM SIGPLAN conference on Systems, Programming, Languages and Applications: Software for Humanity); 7th International Workshop on

Social Software Engineering (SSE); 4th International Workshop on Games and Software Engineering (GAS).

2014: 7th IEEE International Conference on Software Testing, Verification and Validation (ICST); Onward! Essays (part of SPLASH, the ACM SIGPLAN Conference on Systems, Programming, Languages and Applications: Software for Humanity); 6th International Workshop on Social Software Engineering (SSE).

2013: 6th IEEE International Conference on Software Testing, Verification and Validation (ICST); Onward! Essays (part of SPLASH, the ACM SIGPLAN Conference on Systems, Programming, Languages and Applications: Software for Humanity).

2012: **Co-Chair** for 2nd International Workshop on Games and Software Engineering (GAS): Realizing User Engagement with Game Engineering Techniques.

2010: 3rd IEEE International Conference on Software Testing, Verification and Validation (ICST).

2009: Onward! (part of the ACM SIGPLAN Conference on Systems, Programming, Languages and Applications: Software for Humanity); 6th IEEE International Conference on Autonomic Computing (ICAC); 4th International Workshop on Software Engineering for Adaptive and Self-Managing Systems (SEAMS).

2008: 5th IEEE International Conference on Autonomic Computing (ICAC); 3rd International Workshop on Software Engineering for Adaptive and Self-Managing Systems (SEAMS).

2007: 4th IEEE International Conference on Autonomic Computing (ICAC); 16th International World Wide Web Conference (WWW); 2nd Workshop on Software Engineering for Adaptive and Self-Managing Systems (SEAMS); 1st IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO).

2006: 3rd IEEE International Conference on Autonomic Computing (ICAC); 15th International World Wide Web Conference (WWW); 2nd IEEE Symposium on Dependable Autonomic and Secure Computing (DASC).

2005: 2nd IEEE International Conference on Autonomic Computing (ICAC); 3rd IEEE International Conference on Web Services (ICWS); 1st IFIP Workshop on Trusted and Autonomic Ubiquitous and Embedded Systems (TAUES).

2004: 15th IFIP/IEEE International Workshop on Distributed Systems: Operations & Management (DSOM); 13th International World Wide Web Conference (WWW); IASTED International Conference on Software Engineering (SE).

2003: 25th International Conference on Software Engineering (ICSE).

2001: 27th International Conference on Very Large Databases (VLDB); 1st Workshop on Engineering of E-Business Applications (ICEBE) at the IEEE 10th International Workshops on Enabling Technologies: Infrastructure for Collaborative Enterprises (WETICE); Working Conference on Complex and Dynamic Systems Architectures.

2000: Workshop on Technologies for E-Services (TES) affiliated with International Conference on Very Large Databases (VLDB).

1998: **Vice-Chair of Distributed Software Engineering and Languages** for 18th International Conference on Distributed Computing Systems (ICDCS); 10th ACM Conference on Hypertext and Hypermedia (HT).

1997: **Vice-Chair of Programming Languages, Tools and Software Engineering** for 17th International Conference on Distributed Computing Systems (ICDCS); 8th Israeli Conference on Computer Systems and Software Engineering.

1996: 11th Knowledge-Based Software Engineering Conference; International Conference on Information and Knowledge Management; Annual Workshop on Information Technologies and Systems.

1995: **Chair** for 3rd ACM SIGSOFT Symposium on Foundations of Software Engineering, 17th International Conference on Software Engineering; 10th Knowledge-Based Software Engineering Conference.

1994: 2nd ACM SIGSOFT Symposium on Foundations of Software Engineering; 9th International Software Process Workshop; ICSE Workshop on Research Issues in the Intersection Between Software Engineering and Databases.

1993: **Vice-Chair of Programming Languages, Tools and Software Engineering** for 13th International Conference on Distributed Computing Systems, Conference on Organizational Computer Systems; 15th International Conference on Software Engineering; 4th European Software Engineering Conference.

1992: **Chair** for 2nd International Symposium on Environments and Tools for Ada (ACM SIGADA), 5th SIGSOFT Symposium on Software Development Environments; 14th International Conference on Software Engineering; 4th International Conference on Computer Languages; 7th Knowledge-Based Software Engineering Conference.

1991: 6th ACM Conference on Object-Oriented Programming Systems, Languages, and Applications; 1st International Conference on the Software Process; 6th Knowledge-Based Software Engineering Conference; 3rd International Workshop on Software Configuration Management.

1990: 4th ACM SIGSOFT Symposium on Software Development Environments; 12th International Conference on Software Engineering; 6th International Software Process Workshop (keynote presenter); 1st International Symposium on Environments and Tools for Ada (working group moderator); 23rd Hawaii International Conference on System Sciences (minitrack chair).

1989: 11th International Conference on Software Engineering; 9th International Conference on Distributed Computing Systems.

1988: 3rd Ada Applications and Environments Conference; 21st Hawaii International Conference on System Sciences (minitrack chair).

Other Professional Activities

Patents: CODE RELATIVES DETECTION, with Fang-hsiang Su, Lakshminarasimhan Sethumadhavan, Tony Jebara, publication number 20180046441, preliminary February 10, 2015, application filed February 9, 2016, published February 15, 2018; US Patent 10061753, 9372838, 8468445, SYSTEMS AND METHODS FOR CONTENT EXTRACTION [FROM A MARK-UP LANGUAGE TEXT ACCESSIBLE AT AN INTERNET DOMAIN], with Suhit Gupta, Salvatore J. Stolfo, publication number 20170031883, 20130326332, 20070050708, application filed March 30, 2006 published March 1, 2007, application filed May 23, 2013 published December 5, 2013, application filed June 21, 2016 published February 2, 2017; IT TO20030327, Procedimento E Piattaforma Per La Gestione Automatizzata, Gail Kaiser and Giuseppe Valetto, application filed May 2, 2003 (also Method and platform for the automated management of

distributed system, corresponding telecommunications network and computer program product, publication number 20060075087, application filed February 17, 2004, published April 6, 2006).

Conference Organizing Committees: Grace Hopper Celebration of Women in Computing (PhD Forum Committee Member), 2010; IEEE International Workshop on Trusted and Autonomic Computing Systems (Advisory Committee), 2006; 1st IEEE International Conference on Autonomic Computing (Steering Committee), 2004; International Conference on Software Engineering (Tutorials Co-Chair), 2001; International Conference on Software Engineering (Formal Research Demos Chair), 1999.

Advisory Boards: Bergen County [New Jersey] Technical School Computer Science/Information Technology Advisory board, 2016-2018; Microsoft Research University Relations Faculty Advisory Board, Redmond WA, 2003.

Consulting: Trustforte Corp., New York NY, 2008-2018; Educational Testing Service, Princeton NJ, December 1995 and April 2000; University of Massachusetts, Amherst MA, September 1999; Andersen Consulting, Chicago IL, August 1993; Siemens Corporate Research, Princeton NJ, June 1981-September 1992; AT&T Bell Laboratories, Murray Hill NJ, October 1985-December 1991; Software Design & Analysis (consulting firm), Boulder CO, May-August 1991; COMPASS, Inc., Wakefield MA, August 1988; Sun Microsystems, Inc., Mountain View CA, August 1986-January 1987; TRW Defense & Space Systems Group, Dayton OH, November 1980-September 1981.

Grant Panels and Site Visit Committees: NSF CISE panels 2022, 2016, 2015, 2013, 2004, 1998, 1995, 1989 (2); NSF CISE site visit committees 2014, 2012, 1990; Polytechnic University Center for Advanced Technology in Telecommunications internal proposal review panel, 1992; New York State Science and Technology Foundation CAT site visit committee, 1990.

Grant Proposal Reviews (other than panels): The Netherlands Organisation for Scientific Research (NWO); Kuwait University Office of the Vice President of Research; United States-Israel Binational Science Foundation; Stichting informatica-onderzoek in Nederland (The Netherlands Computer Science Research Foundation); Fonds national suisse de la recherche scientifique (Switzerland NSF); Natural Sciences and Engineering Research Council of Canada (NSERC); Montanans On a New Trac for Science (State of Montana, part of NSF Experimental Program to Stimulate Competitive Research); New York State Science and Technology Foundation; numerous NSF programs (Visiting Professorships for Women; International Programs; Information Technology and Organizations; Operating Systems and Systems Software; Programming Languages and Compilers; Experimental Systems; Database and Expert Systems; Design, Tools and Test; Cooperative Science; New Technologies; Software Systems; Software Engineering; Networking and Communications; Computer Systems Architecture).

Journal Article and Book Reviews (in addition to editorial boards): IEEE Access; IEEE Transactions on Reliability; IEEE Transactions on Emerging Topics in Computing, Springer's International Journal on Software Tools for Technology Transfer , ACM Transactions on Internet Technology, IEEE Transactions on Computers, IEEE Multimedia, IEEE Transactions on Mobile Computing, Journal of Biomedical Informatics, IEEE Transactions on Systems, Man and Cybernetics, Pearson Education, Decision Support Systems, Annals of Software Engineering, Journal of Parallel and Distributed Computing, Journal of Empirical Software Engineering, Journal of Automated Software Engineering, The Computer Journal, Theory and Practice of Object Systems, Information Systems, Journal of Integrated Computer-Aided Engineering, Information and Software Technology, Trends in Software, ACM Letters on Programming Languages and Systems, Addison-Wesley, IEEE Computer Society Press, ACM Transactions on Information Systems, IEEE Parallel and Distributed Technology: Systems and Applications, Journal of Complexity, IEEE Transactions on Knowledge and Data Engineering, Machine Learning, ACM Transactions on Computer Systems, ACM Computing Surveys, IEEE Bulletin on Office Knowledge Engineering, IEEE Transactions on Parallel and Distributed Systems, International Journal of Parallel Programming, IEEE Expert, Acta Informatica, ACM Transactions on Programming Languages and Systems, Computer Science Press, IEEE Transactions on Software Engineering, Computer, IEEE Software, Software - Practice & Experience, Communications of the ACM.

Conference Paper Refereeing (in addition to program committees): OOPSLA 2023 external reviewer; 2nd IEEE International Conference on Computer and Communication Technology '11, IEEE International Conference on Data Engineering and Internet Technology '11, 8th Workshop on Hot Topics in Operating Systems '01, HICSS34 Mini-track on Software Tools '01, SIGPLAN Conference on Programming Language Design and Implementation '00, 8th WETICE workshop on Coordinating Distributed Software Development Projects, CASCON '94 and '93, 6th Architectural Support for Programming Languages and Operating Systems, World Computer Congress IFIP '94 and '89, 3rd IFIP Working Conference on Dependable Computing for Critical Applications, 21st International Conference on Fault-Tolerant Computing, 6th and 5th International Parallel Processing Symposium, 2nd IEEE Symposium on Parallel and Distributed Processing, SIGMOD '90, 1990 International Conference on Computer Languages, 26th, 25th, 24th, 22nd and 20th Hawaii International Conference on System Sciences, OOPSLA '88 Conference, 14th ACM SIGACT/SIGPLAN Symposium on Principles of Programming Languages, 8th International Conference on Software Engineering, 1984 ACM SIGSOFT/SIGPLAN Software Engineering Symposium on Practical Software Development Environments, 1982 ACM AdaTEC Conference on Ada.

Invited Meetings: Moderator of SPLASH Ask Me Anything session with Jonathan Bell (Dahl-Nygaard junior prize), 2020; Amazon Scholars & Faculty Summit, 2020; NSF Workshop on Deep Learning and Software Engineering (SE4ML), 2019; Senior Researcher Mentor for the "Mentorship Sessions" at the ACM SIGSOFT International Symposium on the Foundations of Software Engineering, 2016; ARO Workshop on Trustworthy Social Computing, 2009 (co-leader of discussion group on Applications and Requirements for Trustworthy Social Computing); XML and Data Binding, 2003; Dagstuhl Seminar on Future Directions in Software Engineering, 1992; Session Chair at CMU School of Computer Science 25th Anniversary Symposium, 1990; Software Engineering Institute Process Definition Advisory Group, 1990; IFIP Working Group 2.4 Systems Implementation Languages, 1990 (observer); Software Engineering Institute Software Process Modeling Evaluation Symposium, 1989; Alvey Information Systems Factory Workshop, 1987.

Professional societies: Charter Member of the IEEE Computer Society Distinguished Contributor Recognition Program, 2021-2022 (invited to serve on the volunteer committee to evaluate the first applications to this new IEEE-CS program); Vice-Chair for Operations, ACM Special Interest Group on Programming Languages (SIGPLAN), elected term 1991-1993; ACM/SIGPLAN National Lecturer, 1989-1991; ACM SIGPLAN '90 Organizing Committee (Registration Chair), June 1990. Member of AAAI, ACM, IEEE (Senior Member Grade, about 8% of membership is promoted) Computer Society.

Misc.: Academic Reviewer for the Coordinating Committee on Graduate Affairs (CCGA) of the University of California Systemwide Academic Senate, 2017; External Review Committee for Hunter College (CUNY) Computer Science Department, May 2003; Committee of Examiners for Educational Testing Service Computer Science Advanced Test (GRE), 1990-1993.

Current Graduate Student Advising

PhD Advisees: Yangruibo (Robin) Ding (co-advised with Baishakhi Ray), Ira Ceka (co-advised with Baishakhi Ray).

Doctoral Dissertations Supervised

Anthony Saieva [Narin], *Methods and Tools for Practical Software Testing and Maintenance*, deposited December 2023; IBM Research, Yorktown Heights NY.

Jeffrey Bender, *Social Addictive Gameful Engineering (SAGE): A Game-based Learning and Assessment System for Computational Thinking,* deposited June 2023; CBRE, Boston MA.

Riley Spahn, co-advised with Roxana Geambasu, *New Data Protection Abstractions for Emerging Mobile and Big Data Workloads*, deposited March 2020; Software Engineer, Google, Madison WI.

Fang-Hsiang "Mike" Su, co-advised with Simha Sethumadhavan, *Uncovering Features in Behaviorally Similar Programs*, deposited January 2018; Research Scientist, Facebook, New York NY.

Nipun Arora, *Sandboxed, Online Debugging of Production Bugs for SOA Systems*, deposited January 2018; Director of Engineering, Priceline, New York NY.

Jonathan Bell, *Making Software More Reliable by Uncovering Hidden Dependencies*, deposited May 2016; Assistant Professor, Northeastern University, Boston MA.

Leon L Wu, *Improving System Reliability for Cyber-Physical Systems*, deposited September 2015; Founder and CEO, Briskpoint, New York NY.

Swapneel Sheth, *Exploring Societal Computing based on the Example of Privacy*, deposited April 2014; Associate Professor of Practice, University of Pennsylvania, Philadelphia PA.

Christian D. Murphy, *Using Metamorphic Testing at Runtime to Detect Defects in Applications without Test Oracles*, deposited May 2010; Senior Lecturer, Bryn Mawr College, Bryn Mawr PA.

Rean Griffith, *Evaluating Software Systems via Fault-Injection and Reliability, Availability and Serviceability (RAS) Metrics and Models*, deposited October 2008; Head of Analytics, Banyan Security, Oakland CA.

Janak J. Parekh, co-advised with Salvatore Stolfo, *Privacy-Preserving Distributed Event Correlation*, deposited May 2007; Staff Software Engineer, Google, Mountain View CA.

Suhit Gupta, *Context-Based Content Extraction of HTML Documents*, deposited December 2005; CIO, General Atlantic, New York NY.

Giuseppe Valetto, *Orchestrating the Dynamic Adaptation of Distributed Software with Process Technology*, deposited April 2004; Artificial Intelligence Team Leader, Docebo, Milano Italy.

Stephen E. Dossick, *A Virtual Environment Framework for Software Engineering*, deposited November 2000; Senior Director, T-Mobile, Seattle WA.

Jingshuang Jack Yang, *External, Extensible Transaction Services for WWW-Based Collaborative Systems*, deposited May 2000; CTO, Harvest Fund Management, Beijing China.

Steven S. Popovich, *An Architecture for Extensible Workflow Process Servers*, deposited January 1997; Digital Technical Specialist, Caterpillar, Peoria IL.

George T. Heineman, *A Transaction Manager Component for Cooperative Transaction Models*, deposited June 1996; Associate Professor of Computer Science, Worcester Polytechnic Institute, Worcester MA.

Shyhtsun Felix Wu, *Epsilon-Consistent Real-Time Monitoring for Rapidly Changing Data*, deposited July 1995; Professor of Computer Science, University of California at Davis, Davis CA.

Israel Z. Ben-Shaul, *A Paradigm for Decentralized Process Modeling and its Realization in the OzEnvironment*, deposited April 1995; Director of Engineering, Google, Israel.

Ursula Wolz, co-advised with Kathleen Mckeown, *Extending User Expertise in Interactive Environments: A Task-Centered Approach to Automatic Assistance*, deposited May 1992; Founder and CEO, RiverSound Solutions, Montclair NJ.

Naser S. Barghouti, *Concurrency Control in Rule-Based Software Development Environments*, deposited February 1992; Founder and CEO, Objectiva, Dallas TX.

Josephine Micallef, *Incremental Attribute Evaluation for Multi-User Semantics-Based Editors*, Columbia University, deposited May 1991; Senior Research Director, Peraton Labs, New Jersey.

Postdoctoral, MS, Undergraduate and High School Research Supervised

W3998, W4901, E6901 Projects in Computer Science, *E6900 Tutorial in Computer Science*, undergraduate and MS project students, Fall 1985-present total >300.

Mariya Delyakova, Columbia College I.I. Rabi Scholars Program, rising junior in Summer 2019.

Francis Hinson, BA thesis, *An Electrocardiogram-Integrated Wearable Shirt For Continuous Heart Monitoring*, June 2019. (Theodore R. Bashkow undergraduate research award)

Winston Yang, High School summer intern starting as rising sophomore, Summers 2016, 2017, 2018.

Huning (David) Dai, MS thesis, *CONFU: Configuration Fuzzing Testing Framework for Software Vulnerability Detection*, April 2010.

Nipun Arora, MS thesis, *COMPASS: Community driven Parallelization advisor for legacy Software Systems*, May 2009.

Suhit Gupta, MS thesis, *AI2TV - Video Synchronization in a Collaborative Virtual Environment*, May 2001.

Janak J. Parekh, BS thesis, *Palm-sized Hyperweb Manager*, May 1999. (Theodore Bashkow undergraduate research award, CRA Outstanding Undergraduate Research Honorable Mention)

Stephen E. Dossick, BA thesis, *OzWeb: Interfacing the Oz System to the World Wide Web*, December 1996.

Peter D. Skopp, MS thesis, *Low-Bandwidth Operation in a Multi-User Software Development Environment*, December 1995.

Deborah Freedman, CRA Distributed Mentoring Project, Summer 1995.

Giuseppe Valetto, MS thesis, *Expanding the Repertoire of Process-based Tool Integration*, November 1994.

Shelley Tselepis, CRA Distributed Mentoring Project, Summer 1994.

Toni Bünter, Postdoctoral Scholar funded by a Swiss government fellowship, 1992-1993.

Tushar M. Patel, MS thesis, *Real-time Portfolio Management and Automatic Extensions*, October 1991.

Madhav Krish Ponamgi, MS thesis, *MpD: A Multiprocessor Debugger*, September 1991.

Wilfredo Marrero, Columbia University GSAS Minority Summer Research Fellowship, Summer 1991.

Israel Z. Ben-Shaul, MS thesis, *An Object Management System for Multi-User Programming Environments*, April 1991.

Shyhtsun F. Wu, MS thesis, *Towards a Framework for Comparing Object-Oriented Systems*, July 1989.

Michael H. Sokolsky, MS thesis, *Data Migration in an Object-Oriented Software Development Environment*, April 1989.

Takahisa Ishizuka, MS thesis, *Tool Extension in an ALOE Editor*, September 1988.

Harris Morgenstern, MS thesis, *An Inconsistency Management System*, March 1987.

Other Research Supervision

PhD Dissertation Committees (other than advisees): Ziyuan Zhong, *Simulation Based Testing for Autonomous Driving Systems*, January 2024; Lingmei Weng, *Improve the effectiveness of performance diagnostic tools with annotations*, April 2023; Saikat Chakraborty, *Learning To Edit Code*, July 2022; Yuchi Tian, *Detect and repair errors for DNN-based software*, July 2021; Gang Hu, *Techniques for Efficient and Effective Mobile Testing*, January 2018; Kyung Hwa Kim, *Towards Trouble-Free Networks for End Users*, August 2017; Suman Srinivasan, *Improving Content Delivery and Service Discovery in Networks*, February 2016; Ohan Oda, *Supporting Multi-User Interactions in Co-Located and Remote Augmented Reality by Improving Reference Performance and Decreasing Physical Interference*, December 2015; Jong Yul Kim, *On SIP Server Clusters and the Migration to Cloud Computing Platforms*, June 2015; Heming Cui, *Stable Multithreading: A New Paradigm for Reliable and Secure Threads*, November 2014; Jeremy Andrus, *Multi-Persona Mobile Computing*, May 2014; Christopher W.A. Dragert, *Model-Driven Development of AI for Digital Games*, McGill University, School of Computing, January 2014; Wonsang Song, *Next Generation Emergency Call System with Enhanced Indoor Positioning*, December 2013; Omer Boyaci, *High Performance Multimedia Collaboration Tools for Application Sharing, Measuring Capture-to-display Latency, and User Created Services*, July 2011; Dinesh Subhraveti, *Record and vPlay: Problem Determination with Virtual Replay Across Heterogeneous Systems*, July 2011; Oren Laaden, *A Personal Virtual Computer Recorder*, September 2010; Shaya Potter, *Operating System Virtualization Mechanisms for Mobility, Security and System Administration*, August 2009; Haoqiang Zheng, *CPU Scheduling with Automatic Interactivity and Dependency Detection*, July 2009; Knarig Arabshian, *Ontology-based context-aware service discovery in a globally distributed network*, May 2008; Marc Eaddy, *An Empirical Assessment of the Crosscutting Concern Problem*, April 2008; Maryam Kamvar, *Using Context to Improve Query Formulation and Entry from Mobile Phones*, April 2008; Ricardo A. Baratto, *THINC: A Virtual and Remote Display Architecture for Desktop Computing*, October 2007; Xiaotao Wu, *Ubiquitous Programmable Internet Telephony End System Services*, February 2007; Kundan Singh, *Reliable, Scalable and Interoperable Internet Telephony*, June 2006; Sinem Gï¿½vem, *Authoring and Presenting Situated Media in Augmented and Virtual Reality,* April 2006; Shlomo Hershkop, *Behavior-based Email Analysis with Application to Spam Detection*, August 2005; Gaurav S. Kc, *Defending Software Against Process-Subversion Attacks*, April 2005; Alexander V. Konstantinou, *Towards Autonomic Computing*, September 2003; Dongwen Wang, *A Generic Execution Model for Sharing of Computer-Interpretable Clinical Practice Guidelines*, Columbia University Department of Medical Informatics, January 2003; Sushil da Silva, *Netscript: A Language System for Active Networks*, October 2002; Kazi Atif-Uz Zaman, *Computing and Querying Datacubes*, December 2000; Jun Rao, *Advanced Query Processing in Databases*, May 2000; Wenke Lee, *A Data Mining Framework for Constructing Features and Models for Intrusion Detection Systems*, June 1999; Blair MacIntyre, *Exploratory Programming of Distributed Augmented Environments*, December 1998; David Gerstl, *Semantic Concurrency Control, Recovery, and Performance Profiling for Improving Response Time in Database Systems*, State University of New York at Stony Brook, Department of Computer Science, December 1998; Zhe Li, *Distributed Join Query Processing Architecture and Techniques*, August 1997; Bruce Zenel, *A Proxy Based Filtering Mechanism for the Mobile Environment*, July 1997; David Espinosa, *Semantic Lego*, March 1995; William N. Schilit, *Context-Aware Software Reconfiguration Supporting Mobile Distributed Computing*), December 1994; Victor Klig, *The Effect of Representation on Learning to Reason with Problems involving Computer Program Oriented Complex Logic*, Teachers College, November 1990; Subrata Mazumdar, *Knowledge-Based Monitoring of Integrated Networks for*

Performance Management, Columbia University, Department of Electrical Engineering, August 1990; Scott A. Vorthmann, *Syntax-Directed Editor Support for Incremental Consistency Maintenance*, Georgia Institute of Technology, January 1990; Michael van Biema, *The Constraint-Based Paradigm: The Integration of the Object-Oriented and the Rule-Based Programming Paradigms*, November 1989; Nihal Nounou, *A Methodology for Specification-Based Performance Analysis of Protocols*, June 1986.

PhD Thesis Proposal Committees (other than graduated advisees and dissertation committees): Philip Gross (former advisee), Wenwey Hseush (former advisee), Alexia (Henry) Massalin.

PhD Candidacy Exam Committees (other than advisees): Ziyuan Zhong, Yuchi Tian, Ihimu Ukpo, Gang Hu, Shen Wang, Kangkook Jee, Kyung Hwa Kim, Lauren Wilcox, Suman Srinivasan, Omer Boyaci, Dinesh Subhraveti, Hila Becker (former advisee), Oren Laaden, Dan Phung (former advisee), Maryam Kamvar, Josh Reich, Shaya Potter, Knarig Arabsian, Alpa Jain (former advisee), Sinem Guven, Shlomo Hershkop, Haoqiang Zheng, Gaurav Kc (former advisee), Dongwen Wang (Medical Informatics), Carl Tait, Michelle Baker, Monnett Hanvey, Michael van Biema.

Teaching

W6156 Topics in Software Engineering, mostly graduate students, Spring 2016 (51), Spring 2017 (26), Spring 2018 (17), Spring 2019 (23), Spring 2021 (17), Spring 2022 (21); Spring 2023 (11).

W4156 Advanced Software Engineering, upper-level undergraduates and graduate students, Fall 1989 (32), Spring 1998 (20), Spring 2002 (16), Fall 2002 (20), Fall 2003 (29), Spring 2005 (35), Fall 2006 (35), Fall 2007 (39), Fall 2008 (60), Fall 2009 (46), Fall 2010 (104), Fall 2011 (67), Fall 2013 (48), Fall 2014 (46), Fall 2015 (95), Fall 2016 (141), Summer 2017 (7), Fall 2017 (93), Fall 2018 (117), Fall 2020 (113), Fall 2021 (122), Fall 2022 (106).

E6123 Programming Environments and Software Tools, graduate students, Spring 1987 (24), Spring 1989 (12), Spring 1991 (6), Spring 1993 (16), Fall 1996 (17), Fall 1999 (37), Spring 2015 (11).

E6125 Web-Enhanced Information Management, previously *E6998 Web-Based Information Management,* previously *E6113 Topics in Database Systems: WWW-based Collaborative Work*, graduate students, Fall 1997 (28), Fall 2000 (81), Spring 2003 (34), Spring 2004 (27), Spring 2007 (45), Spring 2008 (57), Spring 2009 (36), Spring 2010 (41), Spring 2011 (34), Spring 2012 (35), Spring 2014 (5).

W4111 Database Systems, previously *E6101 Database Systems*, upper-level undergraduates and graduate students, Spring 1988 (56), Fall 2004 (44).

W3156 Introduction to Software Engineering, undergraduates, Spring 1995 (60), Spring 1996 (48), Spring 1997 (68), Spring 1998 (91), Spring 2000 (90), Spring 2001 (110).

W4115 Programming Languages and Translators, upper-level undergraduates and MS students, Spring 1986 (50), Fall 1986 (53), Fall 1987 (82), Fall 1988 (37), Fall 1990 (53), Fall 1992 (47).

W4118 Operating Systems, upper-level undergraduates and MS students, Spring 1992 (53).

W3131 Data Structures, undergraduates, Fall 1985 (71).

Carnegie Mellon University, Introduction to Computing, experimental section for liberal arts majors (in Lisp), lower-level undergraduates, Fall 1981 (approx. 25).

Short courses and Tutorials: University of Illinois at Urbana-Champaign, Software Management, Illinois Software Summer School, guest lecturer, July 1990; IEEE International Conference on Data Engineering, Database Management Systems for Software Engineering, full-day, February 1990; AT&T Bell

Laboratories at Murray Hill and Holmdel, Programming Language Design, Winter 1986-1987 and Summer 1987.

Teaching Assistantships: Carnegie Mellon University, Software Engineering Methods, upper-level undergraduates, Spring 1981.

University Service

Department of Computer Science: PhD Chair 1997-present, PhD Committee 1989-1997; MS Admissions, 2011-present; MS Committee 2004-present; Academic Committee exofficio 2014-present; MS Machine Learning track advisor 2018-2019; MS Software Systems track advisor 2004-2019; Faculty Recruiting 2017-2018 and 1996-1997; WICS faculty advisor 2013-14; PhD Admissions Committee Chair 1997-2008, Member 1994-97, AA review for female and minority applicants 1988-92; Representative to Columbia College and/or Columbia College registration advisor 1999-2003, 1994-98 and 1987-91; Software PhD Qualifier Examination Committee Member 1992-1997, Chair 1986-91, Member 1985-86; Budget Committee Chair 1991-92, Member 1989-91; Scheduling PhD candidate instructors and teaching assistants 1987-92; Faculty Service Committee 1987-89; ``Marriage" Committee (negotiates PhD advisors) 1987-89; Liaison to Software Engineering Institute Academic Affiliates Program 1986-1991; Facilities Committee 1985-89.

School of Engineering and Applied Science: Data Science PhD Specialization Committee 2018-present (We developed and manage a joint specialization option in Data Science available to PhD students in the Applied Mathematics, Computer Science, Electrical Engineering, Industrial Engineering and Operations Research, and Statistics departments at Columbia University.); PhD [COVID-19] Working Group 2020; CEPSR Space Committee 1994-1997; Center for Advanced Technology - Computers & Information Systems Executive Committee 1987-93; Center for Telecommunications Research Co-PI for REU summer program 1990 and 1991; Center for Telecommunications Research Education Committee 1989-1991.

University: Reviewer for Internal Funding Opportunities, 2022-present; Columbia Undergraduate Science Journal Faculty Advisory Board, 2005-2007; Information Systems Subcommittee of the University Planning and Budget Committee Fall 1992.