
Kim P. Kihlstrom

Computer Science Program
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Education

- Ph.D., Computer Engineering** August 1999
University of California, Santa Barbara
Research field: Survivability, Security and Fault Tolerance in Distributed Systems
Committee: Louise Moser, Michael Melliar-Smith, Steven Butner, Michael Reiter
- M.S., Electrical Engineering** June 1993
Stanford University
- B.S., Electrical Engineering** June 1979
Stanford University

Professional Experience

- Associate Professor, Computer Science** 2005-present
Assistant Professor, Computer Science 1999-2005
Westmont College, Santa Barbara, CA

Research: The objective of my research is to design intrusion-tolerant distributed systems that are able to provide useful services despite malicious intrusions that subvert one or more processors, and despite faults or accidents that damage some portion of the system. I am currently working on the design of a new system called Starfish that provides intrusion-tolerance to middleware systems. A number of Westmont students have been involved in this project. Other projects that I have worked on include the SecureRing group communication system, a secure auction service, the Immune system, and Byzantine fault detectors.

Teaching: I have a passion for education at all levels. I participate in curriculum development, hold lectures and laboratory sessions, develop online materials, supervise teaching assistants, and write and grade exams. I enjoy teaching and interacting with students, as well as reading about and reflecting on educational philosophies and strategies. I have a particular focus on gender issues within computer science, a keen interest in curriculum development including interdisciplinary connections, and am active in exploring the effective use of technology in the classroom.

- Graduate Student Researcher** 1995-1999
ECE Department, University of California, Santa Barbara, CA
My thesis work included the design and implementation of the SecureRing group communication system. The system provides reliable totally ordered message delivery and group membership services that continue to operate correctly despite malicious attack from within the system. I also collaborated on the design of the Immune system, which provides survivability to CORBA applications transparently, enabling them to continue to operate despite intrusions, accidents or faults. Additionally, I did foundational work in the area of malicious (Byzantine) fault detectors.

- Instructor, Engineering-Physics** 1984-1992; 1993-1994; 1996
Westmont College, Santa Barbara, CA
Held lectures and laboratory sessions, supervised teaching assistants, developed new curricula for several courses, assisted in the development of several textbooks, wrote assignments and solutions, and wrote and graded exams.

- Teaching Assistant** 1992-1993
Stanford University, Stanford, CA
Taught circuits laboratory, held office hours, wrote assignments and solutions, and wrote and graded exams.

Development Engineer

1979–1981

Hewlett Packard Company, Palo Alto, CA

Designed microwave amplifiers and pulse modulators used in 2.0–6.5 GHz and 6.0–12.5 GHz signal generators. Supervised transfer of units to production.

Summer Intern

Summers 1975, 1976, 1977, 1978

Hewlett Packard Company, Santa Rosa, CA

Developed computer modeling programs for device fabrication processes and microwave devices, did wiring and assembly of electronic instruments, worked on computer data base system, and performed technical data correlation and microwave transistor evaluation.

Awards and Honors**Principal Investigator, National Science Foundation Grant**

“Connection-Oriented Computer Science Education,” Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) Program, \$287,500, 2007–2011

Principal Investigator, National Science Foundation Grant

“Survivable, Adaptive, and Scalable Distributed Systems,” Cyber Trust Program, \$178,050, 2005–2008

Bruce and Adaline Bare Teacher of the Year Award

Natural and Behavioral Sciences, Westmont College, 2003–2004

Faculty Research Award

Westmont College, 2003–2004

Wilkes Award

Best paper published in a volume (year) of *The Computer Journal*, 2004

Principal Investigator, National Science Foundation Grant

Computer Science, Engineering, and Mathematics Scholarships (CSEMS) Program, \$55,000, 2002–2006

Phi Kappa Phi Honor Society

Inducted 2003

University of California Doctoral Scholar Fellowship

Awarded by University of California, Santa Barbara for four years of doctoral study, 1994

Courses Taught**General Education Courses:**

Fundamentals of Computing
Information and Computation
Technology and European Society

Computer Science Major Courses:

Introduction to Computer Science I
Introduction to Computer Science II
Computer Organization and Architecture
Data Structures and Algorithms
Programming Languages
Networks
Distributed Systems
Operating Systems

Engineering-Physics Courses:

Circuits and Electronics
Circuits and Electronics Laboratory
General Physics Laboratory (for engineering and physics majors)
Physics Laboratory (for life science majors)

Professional Service

Review Panels: National Science Foundation Cyber Trust Panel, June 2008; Hope College Department of Computer Science External Review (Chair), November 2006

Boards: Consortium for Computing Sciences in Colleges, Southwestern Region, Regional Representative to National Board, 2007-2010

Program Committees: Student Posters Chair, CCSC Second Annual Southwestern Regional Conference, San Diego, CA, April 2009; Student Posters Chair, CCSC First Annual Southwestern Regional Conference, Northridge, CA, April 2008; International Program Committee, Twentieth IASTED International Conference on Parallel and Distributed Computing and Systems, Orlando, FL, November 2008; International Program Committee, Nineteenth IASTED International Conference on Parallel and Distributed Computing and Systems, Cambridge, MA, November 2007; International Program Committee, Eighteenth IASTED International Conference on Parallel and Distributed Computing and Systems, Dallas, TX, November 2006; International Program Committee, Seventeenth IASTED International Conference on Parallel and Distributed Computing and Systems, Phoenix, Arizona, November 2005; International Program Committee, Sixteenth IASTED International Conference on Parallel and Distributed Computing and Systems, MIT, Cambridge, November 2004; International Program Committee, Fifteenth IASTED International Conference on Parallel and Distributed Computing and Systems, Marina del Rey, California, November 2003

Technical Committees: IASTED Technical Committee on Parallel and Distributed Computing and Systems (2001-2004)

External Referee: *ACM Transactions on Computer Systems*, *IEEE Transactions on Dependable and Secure Computing*, *IEEE Transactions on Computers*, *Journal of Parallel and Distributed Systems*, *Software: Practice and Experience*, *Journal of Theoretical Computer Science*, *IEEE Communications Letters*, *Journal of Information Science and Engineering*, *Dependable Systems and Networks: Performance and Dependability Symposium*, *IEEE Internet Computing*, *ACM Symposium on Principles of Distributed Computing*, *International Symposium on Distributed Computing*, *IEEE Symposium on Reliable Distributed Systems*

Session Chair: ACM Technical Symposium on Computer Science Education, Portland, Oregon, March 2008; Nineteenth IASTED International Conference on Parallel and Distributed Computing and Systems, Cambridge, MA, November 2007; ACM Technical Symposium on Computer Science Education, Houston, Texas, March 2006; ACM Technical Symposium on Computer Science Education, Norfolk, Virginia, March 2004; Fifteenth IASTED International Conference on Parallel and Distributed Computing and Systems, Marina del Rey, California, November 2003; ACM Technical Symposium on Computer Science Education, Reno, Nevada, February 2003; Thirteenth IASTED International Conference on Parallel and Distributed Computing and Systems, Anaheim, California, August 2001, ACM Technical Symposium on Computer Science Education, Charlotte, North Carolina, February 2001

Member: Association for Computing Machinery (ACM) and ACM Special Interest Group on Computer Science Education (SIGCSE); Institute of Electrical and Electronics Engineers (IEEE) and IEEE Computer Society; Association of Christians in the Mathematical Sciences; Working Group on Integrating Mathematical Reasoning into Computer Science Curricula

Publications

Research Publications: (* indicates Westmont student authors)

K. P. Kihlstrom, R. S. Elliott*, K. A. Marshman*, and A. C. Smith*, "Intrusion-Tolerant Dissemination in Large-Scale Systems," in *Proceedings of the 2008 International Conference on Parallel and Distributed Processing Techniques and Applications*, Las Vegas, Nevada, July 2008, pp. 934-940

K. P. Kihlstrom, J. L. Stewart*, N. T. Lounsbury*, A. J. Rogers*, and M. C. Magnuson*, "Implementation and Performance Testing of a Gossip-Based Communication System," in *Proceedings of the Nineteenth IASTED International Conference on Parallel and Distributed Computing and Systems*, Cambridge, MA, November 2007, pp. 194-199

K. P. Kihlstrom, P. Narasimhan, C. Phillips*, C. Ritchey*, and B. LaBarbera*, "The Architecture of the Starfish System: Mapping the Survivability Space," in *Proceedings of the IASTED International Conference on Parallel and Distributed Computing and Systems*, Marina del Rey, California, November 2003, pp. 833-843

K. P. Kihlstrom and P. Narasimhan, “The Starfish System: Providing Intrusion Detection and Intrusion Tolerance for Middleware Systems,” in *Proceedings of the IEEE Workshop on Object-Oriented Real-Time Dependable Systems (WORDS)* (invited for presentation), Guadalajara, Mexico, January 2003, pp. 191–199

K. P. Kihlstrom, L. E. Moser and P. M. Melliar-Smith, “Byzantine Fault Detectors for Solving Consensus,” *The Computer Journal* 46(1):16–35, 2003 (received Wilkes award for best paper published in volume)

K. P. Kihlstrom, L. E. Moser, and P. M. Melliar-Smith, “The SecureRing Group Communication System,” *ACM Transactions on Information and System Security* 4(4):371–406, November 2001

K. P. Kihlstrom, N. Narasimhan, L. E. Moser and P. M. Melliar-Smith, “A Secure Auction Service,” in *Proceedings of the IASTED International Conference on Parallel and Distributed Computing and Systems*, Anaheim, California, August 2001, pp. 599–604

K. P. Kihlstrom, *Survivable Distributed Systems: Design and Implementation*, Ph.D. Dissertation, Department of Electrical and Computer Engineering, University of California, Santa Barbara, Technical Report 99–19, August 1999

P. Narasimhan, K. P. Kihlstrom, L. E. Moser and P. M. Melliar-Smith, “Providing Support for Survivable CORBA Applications with the Immune System,” in *Proceedings of the 19th IEEE International Conference on Distributed Computing Systems*, Austin, Texas, May 1999, pp. 507–516

K. P. Kihlstrom, L. E. Moser and P. M. Melliar-Smith, “The SecureRing Protocols for Securing Group Communication,” in *Proceedings of the 31st IEEE Hawaii International Conference on System Sciences*, Kona, Hawaii, January 1998, vol. 3, pp. 317–326

K. P. Kihlstrom, L. E. Moser and P. M. Melliar-Smith, “Solving Consensus in a Byzantine Environment Using an Unreliable Fault Detector,” in *Proceedings of the International Conference on Principles of Distributed Systems*, Chantilly, France, December 1997, pp. 61–75

K. Berket, R. K. Budhia, K. P. Kihlstrom, *et al.*, “On Technologies in Computer Networks and Distributed Systems,” *looking.forward* supplement to *IEEE Computer*, 4(3), Fall 1997

K. P. Kihlstrom, “Microwave Solid-State Amplifiers and Modulators for Broadband Signal Generators,” *Hewlett Packard Journal: Technical Information from the Laboratories of Hewlett-Packard Company*, 33(7):30–31, July 1982

Pedagogy Publications:

K. P. Kihlstrom, “Fire! Lessons Learned and Applied to Computer Systems,” in *Proceedings of the Seventeenth Biennial ACMS Conference*, Wheaton, IL, May 2009, to appear

K. P. Kihlstrom, “Connection-Oriented Computer Science Education,” in *Proceedings of the Sixteenth Biennial ACMS Conference*, Grantham, PA, May 2007, pp. 47–60

K. P. Kihlstrom, “Asserting CS != Can’t Socialize: Building Community in a Computer Science Program” (full version), in *Journal of the ACMS*, 2006

K. P. Kihlstrom, “Asserting CS != Can’t Socialize: Building Community in a Computer Science Program” (brief version), in *Proceedings of the ACMS Biennial Conference*, Huntington, IN, June 2005, pp. 249–257

K. P. Kihlstrom, “Men Are From The Server Side, Women Are From The Client Side: A Biblical Perspective On Men, Women, and Computer Science,” in *Proceedings of the ACMS Biennial Conference*, San Diego, CA, May 2003, pp. 126–137

P. B. Henderson, V. Almstrum, P. De Palma, O. Hazzen, and K. P. Kihlstrom, “Women, Mathematics and Computer Science,” (panel discussion), in *Proceedings of the 33rd ACM Technical Symposium on Computer Science Education*, February 2002, pp. 131–132

R. J. Smith, A. M. Fauchet, H. Fong, D. Hayes and K. Kihlstrom, *Electronics: Circuits and Devices—Instructor’s Manual*, John Wiley and Sons, 1987