



## University of Virginia

## Facts

- Founded by Thomas Jefferson in 1819
- Among the top 25 schools
- Total number of faculties 2,102
- Undergrad enrollment (fall 06): 13,435
- Graduate enrollment (Fall 06): 6,351

## Research Projects

- [National compiler Infrastructure/Zephyr](#) - Jack Davidson
  - Generate intermediate code from abstract syntax desc. Language
  - Translation from inter. language to machine code uses description of instruction.
  - Optimization
- [Brainpower for Business: resources and solutions for business](#) - Alf Weaver
  - Provides business assistance to start-up companies
- [Lava: The Laboratory for Computer Architecture at Virginia](#) - Kevin Skadron
  - ILP, branch prediction, memory hierarchy, arch. for embedded env., simulation
- [Legion: World-wide Virtual Computer](#) - Andrew Grimshaw & Marty Humphrey
  - Test bed for application with large degree of parallelism and complex physical sys. (since 1993)
- [Survivability Architectures](#) - John Knight, Kevin Sullivan & John Mchugh
  - Developing a s/w framework to ensure a particular infrastructure requirement of reliability, availability, security and human safety
- [Isotach: Concurrency Control without Locks or Barriers](#) - Paul Reynolds
  - IPC in distributed or parallel computing using logical time system.
- [Package-oriented Programming \(POP\)](#) - Kevin Sullivan
  - Investigating the reuse and integration of very large-scale components

## Research Projects

- [Infotech: Info. Tech. for Mobile and Web-based Systems](#) - Sang Son
  - QoS, security, data consistency in mobile envr., web-based system.
- [Holst - Hierarchical Loadable Schedulers](#) - Jack Stankovic
  - Arch. that allows OS to schedule conventional and real-time task with diverse requirement
- [LCLint: Annotation-Assisted Static Checking](#) - David Evans
  - Using user defined annotation to check the correctness of code
- [Feedback Control Real-time Scheduling](#) - Jack Stankovic, Sang Son, Gang tao, & Tarek Abdelzaher
  - Continuously adjust the scheduler to maintain stable performance
- [Application Intrusion Detection](#) - Anita Jones
  - Detect intrusion at application context via signature-behavior of functional portion of large application

# John Stankovic



- Professor (joined 1997),
- Ph.D.: Brown University (1979)
- Research Interest:
  - Real-time computing, embedded computing
  - operating systems
  - wireless sensor networks
  - large scale distributed computing.
- Principal Investigator of Laboratory for Next Generation Real-Time Computing, UVA
- Edited 5 books, and many book chapters
- Award
  - BP America Professor (CS) UVA, since 1997.

# Publication

- [Security in Wireless Sensor Networks](#), A. Perrig, J. Stankovic, and D. Wagner, Communications of the ACM, 2004.
- [Radio-Triggered Wake-Up Capability for Sensor Networks](#), L. Gu and J. Stankovic, IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), 2004 (**Best Paper Award**)
- [t-kernel: A Naturalizing OS Kernel for Low Power Cost Effective Computers](#), L. Gu and J. Stankovic, ACM SOSP, poster session, 2005.
- [Efficiency Centric Communication Model For Wireless Sensor Networks](#), Q. Cao, T. He, L. Fang, T. Abdelzaher and J. Stankovic, S. Son, Infocom 2006.
- [Achieving Long Term Surveillance in VigilNet](#), T. He, P. Vicaire, T. Yan, Q. Cao, L. Luo, L. Gu, G. Zhou, J. Stankovic, and T. Abdelzaher, Infocom 2006.
- [Achieving Repeatability of Asynchronous Events in Wireless Sensor Networks with EnviroLog](#), L. Luo, T. He, T. Abdelzaher, J. Stankovic, G. Zhou and L. Gu, Infocom 2006,
- [MMSN: Multi-Frequency Media Access Control for Wireless Sensor Networks](#), G. Zhou, C. Huang, T. Yan, T. He and J. Stankovic, Infocom 2006.

# Publication

- [Lightweight Detection and Classification for Wireless Sensor Networks in Realistic Environments](#), L. Gu, D. Jia, P. Vicaire, T. Yan, L. Luo, T. He, A. Tirumala, Q. Cao, J. Stankovic, T. Abdelzaher, and B. Krogh, ACM SenSys 2005,
- [Spotlight: A High Accuracy, Low-Cost Localization System for Wireless Sensor Networks](#), R. Stoleru, T. He, J. Stankovic, ACM Sensys 2005.
- [RID: Radio Interference Detection in Wireless Sensor Networks](#), G. Zhou, T. He, J. Stankovic and T. Abdelzaher, Infocom, 2005.
- [Impact of Radio Asymmetry on Wireless Sensor Networks](#), G. Zhou, T. He, S. Krishnamurthy, J. Stankovic, Mobisys, 2004.
- [Energy-Efficient Surveillance Systems Using Wireless Sensor Networks](#), T. He, S. Krishnamurthy, J. Stankovic, T. Abdelzaher, L. Luo, T. Yan, J. Hui and B. Krogh, Mobisys, 2004.
- [Efficient TCP Connection Failover in Web Server Clusters](#), R. Zhang, T. Abdelzaher, and J. Stankovic, Infocom, 2004.
- [Range-Free Localization Schemes for Large Scale Sensor Networks](#), T. He, C. Huang, B. Blum, J. Stankovic, T. Abdelzaher, Mobicom, 2003.

# Jack Davidson



- Professor (joined in 1982)
- Ph.D.: U of Arizona, 1981
- Research Interest:
  - Compilers, code generation, optimization, and computer architecture
- Projects
  - National Compiler Infrastructure (NCI) project, which developed [Zephyr](#), a tool suite for compiler and architecture research.
  - New s/w dev. environment. for high-performance embedded app.
- Books
  - *C++ Program Design (best selling, 1997)*
  - *Java Program Design (2003)*

## Publication

- [Compile-time Planning for Overhead Reduction in Software Dynamic Translators](#), N. Kumar, B. R. Childers, D. Williams, J. W. Davidson, and M. L. Soffa, International Journal on Parallel Programming, 05.
- [Continuous Compilation: A New Approach to Aggressive and Adaptive Code Transformation](#), Bruce Childers, Jack Davidson, and Mary Lou Soffa, NSF Next Generation Software Workshop, during the International Parallel and Distributed Processing Symposium (IPDPS), France, 03.
- [A Formal Specification for Procedure Calling Conventions](#), M. W. Bailey and J. Davidson, SIGPLAN-SIGACT Symposium on Principles of Programming Languages, 1995
- [Memory Access Coalescing: A Technique for Eliminating Redundant Memory Accesses](#), J. Davidson and S. Jinturkar, SIGPLAN Symposium on Programming Language Design and Implementation, 1994
- [Relating Static and Dynamic Machine Code Measurements](#), J. Davidson, J. Rabung and D. Whalley, IEEE Transactions on Computers, 1992

## Publication

- [Target-Sensitive Construction of Diagnostic Programs for Procedure Calling Sequence Generators](#), Bailey, M. W. and Davidson, J. W., Proc. SIGPLAN Symposium on Programming Language Design and Implementation, 1996.
- [Aggressive Loop Unrolling in a Retargetable, Optimizing Compiler](#), Davidson, J. W. and Jinturkar, S., Proc. Compiler Construction Conference, Sweden, 1996.
- [Improving Instruction-level Parallelism by Loop Unrolling and Dynamic Memory Disambiguation](#), Davidson, J. W. and Jinturkar, S., Proc. 28th Annual IEEE/ACM International Symposium on Microarchitecture, 1995.
- [The Advantages of Machine-Dependent Global Optimization](#), Benitez, M. E. and Davidson, J. W., Proc. Conference on Programming Languages and Systems Architectures, Switzerland, 1994.
- [Memory Bandwidth Optimizations for Wide-Bus Machines](#), Alexander, M. J., Bailey, M. W., Childers, B. R., Davidson, J. W., and Jinturkar, S., Proc. Annual Hawaii International Conference on System Sciences, 1993.

## Alfred Weaver



- Professor (joined 1977)
- Ph.D.: UIUC (1976)
- Research Interest:
  - Computer networks, network protocols, telemedicine, electronic commerce
  - medical data privacy and security
- Co-authored four books, six book chapters, over 140 refereed papers,

## Publication

- [Enforcing Data Security with Web Services](#), Weaver, A.C., IEEE Int. Conf. on Industrial Technology (ICIT'05), Hong Kong
- [A Privacy Preserving Enhanced Trust Building Mechanism for Web Services](#), Wu, Zhengping, and Weaver, Alfred C., Conf. on Privacy, Security, and Trust (PST'05), Canada, 05.
- [A Security Architecture for Distributed Data Security](#), Weaver, A.C., IEEE Int. Conf. on Emerging Technologies and Factory Automation (ETFA'05), Italy, 2005.
- [Dynamic Trust Establishment with Privacy Protection for Web Services](#), Wu, Zhengping, and Weaver, Alfred C., IEEE Int. Conf. on Web Services, 2005.
- [Token-Based Dynamic Trust Establishment](#), Wu, Zhengping, and Weaver, Alfred C., ACM Southeast Conference, 2005.
- [Enforcing Distributed Data Security via Web Services](#), Weaver, Alfred C., IEEE Workshop on Factory Communications Systems, Austria, 2004.
- [Dynamic, Context-Aware Access Control for Distributed Healthcare Applications](#), Hu, Junzhe, and Weaver, Alfred C., Workshop on Pervasive Security, Privacy, and Trust (PSPT'04)
- [Distributing Internet Services to the Network's Edge](#), Alfred C. Weaver and Michael W. Condry, IEEE Transactions on Industrial Electronics, 2003

## Publication

- [Network Communications for Cluster Computing](#), Weaver, A. C., Local Computer Networks 1998.
- [\(M,P,S\) -- An Efficient Self-Similar Traffic Model for Wide-Area Network Simulation](#), Lucas, Matthew T., Dempsey, Bert J., Wrege, Dallas E., and Weaver, Alfred C., IEEE Globecom '97.
- [MESH: Distributed Error Recovery for Multimedia Streams in Wide-Area Multicast Networks](#), Lucas, Matthew T., Dempsey, Bert J., and Weaver, Alfred C., IEEE Inter. Conf. on Communications (ICC'97), Canada.
- [The Internet and the World Wide Web](#), Weaver, A. C., IECON'97
- [Xpress Transport Protocol Version 4](#), Weaver, A. C., IEEE International Workshop on Factory Communications Systems, Switzerland, 1995.
- [On Retransmission-Based Error Control for Continuous Media Traffic in Packet-Switching Networks](#), Dempsey, Bert J., Liebeherr, Jorg, and Weaver, Alfred C., SIGCOMM'94, London.

## Mary Lou Sofa



- Professor and Department Chair
- Ph.D.: U. of Pittsburgh (1977)
- Research Interest:
  - Optimizing compilers
  - Compilers for embedded systems,
  - Program analysis, debugging and testing

## Publication

- [Catching and Identifying Bugs in Register Allocation](#), Yuqiang Huang, Bruce R. Childers, and Mary Lou Sofa, Symposium on Static Analysis, Korea, 2006.
- [Techniques and Tools for Dynamic Optimization](#), Jason D. Hiser, Naveen Kumar, Min Zhao, Shukang Zhou, Bruce R. Childers, Jack W. Davidson, and Mary Lou Sofa, NSF Next Generation Software Workshop, 2006, Greece.
- [Dimension: An Instrumentation Tool for Virtual Execution Environments](#), Jing Yang, Shukang Zhou, and Mary Lou Sofa, Second Int'l. Conf. on Virtual Execution Environments (VEE '06).
- [Testing in Resource Constrained Execution Environments](#), Gregory M. Kapfhammer, Mary Lou Sofa and Daniel Mosse, ACM/IEEE International Conference on Automated Software Engineering, 2005
- [Planning for Code Buffer Management in Distributed Virtual Execution Environments](#), Shukang Zhou, Bruce R. Childers and Mary Lou Sofa, ACM/USENIX Virtual Execution Environments Conference (VEE'05).
- [Demand-Driven Structural Testing with Dynamic Instrumentation](#), Jonathan Misurda, James Clause, Juliya L. Reed, Bruce Childers and Mary Lou Sofa, ACM SIGSOFT Int'l. Conference on Software Engineering (ICSE'05).

## Publication

- [Low Overhead Program Monitoring and Profiling](#), Naveen Kumar, Bruce R. Childers and Mary Lou Sofa, ACM SIGPLAN/SIGSOFT Workshop on Program Analysis for Software Tools and Engineering (PASTE'05).
- [TDB: A Source-Level Debugger for Dynamically Translated Programs](#), Naveen Kumar, Bruce R. Childers and Mary Lou Sofa, ACM SIGPLAN/SIGSOFT Sixth Int'l. Symposium on Automated and Analysis-Driven Debugging (AADEB'05).
- [Jazz: A Tool for Demand-Driven Structural Testing](#), J Misurda, J Clause, J L Reed, P Gandra, B R Childers, M L Sofa, 14th ETAPS Int'l Conf. on Compiler Construction (CC'05).
- [A Model-based Framework: An Approach for Profit-driven Optimization](#), Min Zhao, Bruce R. Childers, and Mary Lou Sofa, ACM SIGMICRO Int'l. Conf. on Code Generation and Optimization (CGO'05).
- [The Impact of Software Engineering Research on Modern Programming Languages](#), Barbara Ryder, Mary Lou Sofa, and Margaret Burnett, ACM Transactions on Software Engineering, 2005.
- [Predicting the impact of optimizations for embedded systems](#), Min Zhao, Bruce R. Childers, and Mary Lou Sofa, ACM SIGPLAN Symposium on Languages, Compilers, and Tools for Embedded Systems, 2003
- [The limits of speculative trace reuse on deeply pipelined processors](#), M. L. Pilla, P. O. A. Navaux, A. T. da Costa, F. M. G. Franca, B. R. Childers and M. L. Sofa, The 15th Symposium on Computer Architecture and High Performance Computing, Brazil, 2003

# William Wulf

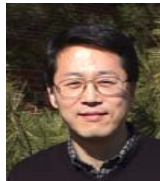


- Professor (since 1990)
- President of the National Academy of Engineering
- Faculty of CMU (1968 – 1981),
- Asst. Director of NSF (1988 – 1990)
  
- Ph.D.: UVA (1968, 1<sup>st</sup> CS Ph.D. in UVA)
- Research Interest:
  - National science policy
  - Architecture
  - Security
- Contribution
  - He designed Bliss, a systems-implementation language adopted by DEC minicomputer.
  - He designed and constructed the C.mmp multiprocessor and Hydra, one of the first OS to explore capability-based protection.
  - He developed PQCC, a technology for the automatic construction of optimizing compilers, and
  - He designed the WM pipelined processor.

# Publication

- [Are We Scientists or Engineers?](#), William A. Wulf, ACM Computing Surveys, 1995.
  
- [How Shall We Satisfy the Long-Term Educational Needs of Engineers?](#), William A. Wulf, Proceedings of the IEEE, 2000.
  
- [The Legion Vision of a Worldwide Virtual Computer](#), A. S. Grimshaw and William A. Wulf, Communications of the ACM, 1997.
  
- [Collaboratories - Doing Science on the Internet](#), Richard T. Kouzes, James D. Myers, and William A. Wulf, IEEE Computer, 1996.
  
- [HYDRA - the Kernel of a Multiprocessor Operating System](#), W. Wulf, E. Cohen, W. Corwin, A. Jones, R. Levin, C. Pierson, and F. Pollack, Communications of the ACM, 1974.

# Sang Son



- Professor
- Ph.D.: U. of Maryland (1986)
- Research Interest:
  - Real-time computing, database and data services,
  - QoS management, data services in embedded and mobile networks, and information security
- Current Projects
  - QoS management for real-time data services
  - NEST: Network virtual machine for real-time coordination
  - Feedback control real-time scheduling
- Previous Projects
  - BeeHive: distributed real-time multimedia database
  - Infotech: mobile and web-based information services
  - StarBase real-time database server
  - Transaction scheduling
  - Predictability and database modeling
  - Multimedia synchronization

# Publication

- [Feedback Control Architecture and Design Methodology for Service Delay Guarantees in Web Servers](#), C. Lu, Y. Lu, T. Abdelzaher, J. Stankovic, and S. H. Son, IEEE Trans. on Parallel and Distributed Systems, 2006.
  
- [Specification and Management of QoS in Real-Time Database Supporting Imprecise Computations](#), M. Amirijoo, J. Hansson, and S. H. Son, IEEE Transactions on Computers, 2006.
  
- [Generalized Performance Management of Multi Class Real-Time Imprecise Data Services](#), M. Amirijoo, N. Chaufette, J. Hansson, S. H. Son, and S. Gunnarsson, IEEE Real-Time Systems Symposium, 2005
  
- [Real-Time Databases and Data Services](#), K. Ramamritham, S. H. Son, and L. DiPippo, Real-Time Systems Journal, 2004.
  
- [Managing Deadline Miss Ratio and Sensor Data Freshness in Real-Time Databases](#), K. Kang, S. H. Son, and J. Stankovic, IEEE Transactions on Knowledge and Data Engineering, 2004
  
- [Multiversion Locking Protocol with Freezing for Secure Real-Time Database Systems](#), C. Park, S. Park, and S. H. Son, IEEE Transactions on Knowledge and Data Engineering, 2002.
  
- [Feedback Control Real-Time Scheduling: Framework, Modeling, and Algorithms](#), C. Lu, J. Stankovic, G. Tao, and S. H. Son, Real-Time Systems Journal, Special Issue on Control-Theoretical Approaches to Real-Time Computing, 2002.

## Publication

- [Concurrency Control using Timestamp Ordering in Broadcast Environments](#), V. Lee, K. Lam, and S. H. Son, Computer Journal, 2002.
- [Integrating Security and Real-Time Requirements using Covert Channel Capacity](#), S. H. Son, R. Mukkamala, and R. David, IEEE Transactions on Knowledge and Data Engineering, 2000.
- [Resolving Executing-Committing Conflicts in Distributed Real-Time Database Systems](#), K. Lam, C. Pang, S. H. Son, and J. Cao, Computer Journal, 1999.
- [On Using Real-Time Static Locking Protocols for Distributed Real-Time Databases](#), K. Lam, S. Hung, and S. H. Son, Journal of Real-Time Systems, 1997.
- [A Virtual Testing Method for Event-Driven Real-Time Applications](#), M. Lee and S. H. Son, IEEE Workshop on Real-Time Applications, 1994.
- [Semantic-Based Concurrency Control for Object-Oriented Database Systems Supporting Real-Time Applications](#), J. Lee and S. H. Son, 6th IEEE Euromicro Workshop on Real-Time Systems, Sweden, 1994.
- [An Approach Towards Predictable Real-Time Transaction Processing](#), Y. Kim and S. H. Son, 5th Euromicro Workshop on Real-Time Systems, Finland 1993.
- [An Integrated Real-Time Locking Protocol](#), S. H. Son, S. Park, and Y. Lin, Eighth IEEE International Conference on Data Engineering, 1992.

## Andrew Grimshaw



- Professor
- Ph.D.: UIUC (1988)
- Research Interest:
  - Grid computing
  - high-performance parallel computing
  - compilers for parallel systems
  - operating systems
- Project
  - Legion: World-wide Virtual Computer

## Publication

- [The Development of Dependable and Survivable Grids](#), A. Grimshaw, M. Humphrey, J.C. Knight, A. Nguyen-Tuong, J. Rowanhill, G. Wasson, and J. Basney. Workshop on Dynamic Data Driven Applications, 2005.
- [JobQueue: A Computational Grid-wide Queuing System](#), D. Katramatos, M. Humphrey, A. Grimshaw, and S. Chapin, Int'l Workshop on Grid Computing, 2001
- [LegionFS: A Secure and Scalable File System Supporting Cross-Domain High-Performance Applications](#), B. White, M. Walker, M. Humphrey, and A. Grimshaw, Proc. of SC 2001.
- [Protein Folding on the Grid: Experiences using CHARMM under Legion on NPACI Resources](#), A. Natrajan, A. Fox, M. Humphrey, A. Grimshaw, M. Crowley, N. Wilkins-Diere, Int'l Symposium on High Performance Distributed Computing (HPDC), 2001.
- [Grids: Harnessing Geographically-Separated Resources in a Multi-Organisational Context](#), A. Natrajan, M.A. Humphrey and A.S. Grimshaw, High Performance Computing Systems, June 2001.
- [Legion MPI: High Performance in Secure, Cross-MSRC, Cross-Architecture MPI Applications](#), M. Humphrey, N. Beekwilder, K. Holcomb, and A. Grimshaw, 2001 DoD HPC Users Group Conference.
- [Capacity and Capability Computing using Legion](#), A. Natrajan, M. Humphrey, and A. Grimshaw, Proc. of the 2001 International Conference on Computational Science.

## Publication

- [Grid Based File Access: The Legion I/O Model](#), B. White, A. Grimshaw, and A. Nguyen-Tuong, Proc. of the Symposium on High Performance Distributed Computing (HPDC-9), 2000.
- [Architectural Support for Extensibility and Autonomy in Wide-Area Distributed Object Systems](#), A.S. Grimshaw, M.J. Lewis, A.J. Ferrari and J.F. Karpovich, Proc. of the 2000 Network and Distributed Systems Security Conference (NDSS'00).
- [Accountability and Control of Process Creation in Metasystems](#), M. Humphrey, F. Knabe, A. Ferrari, and A. Grimshaw, Proc. of the 2000 Network and Distributed Systems Security Conference (NDSS'00).
- [The Legion Resource Management System](#), S.J. Chapin, D. Katramatos, J.F. Karpovich and A.S. Grimshaw, Proc. of the 5th Workshop on Job Scheduling Strategies for Parallel Processing in conjunction with the International Parallel and Distributed Processing Symposium, 1999.
- [A Flexible Security System for Metacomputing Environments](#), A.J. Ferrari, F.C. Knabe, M. Humphrey, S.J. Chapin, and A.S. Grimshaw, 7th International Conference on High-Performance Computing and Networking Europe (HPCN'99).
- [The Core Legion Object Model](#), M. Lewis and A.S. Grimshaw, Proc. of the Symposium on High Performance Distributed Computing (HPDC-5), 1996

# Paul Reynolds



- Professor (joined 1980)
- Ph.D.: U. of Texas, Austin (1979)
- Research Interest:
  - Modeling and simulation technology
  - Parallel and distributed systems
  - Computing for the blind

# Publication

- [Using Space-Time Constraints to Guide Model Interoperability](#), Paul Reynolds, Proceedings of Simulation Interoperability Workshop, 2002.
- [Delta Coherence Protocols](#), Craig Williams, Paul Reynolds, and Bronis de Supinski, IEEE Concurrency, 2000.
- [Elastic Time](#), Sudhir Srinivasan and Paul Reynolds, ACM Transactions on Modeling and Computer Simulation, 1998
- [Consistency Maintenance in Multi-Resolution Simulations](#), Paul Reynolds, Sudhir Srinivasan, and Anand Natrajan, ACM Trans on Modeling and Computer Simulation, 1997.
- [Isotach Networks](#), Paul Reynolds, Craig Williams, and Raymond Wagner, IEEE Transactions on Parallel and Distributed Systems, 1997.
- [Semi-Automated Simulation Transformation for DDDAS](#), David C. Brogan, Paul F. Reynolds, Robert G. Bartholet, Joseph C. Carnahan and Yannick Loitiere, Proc. of the Int'l Conf. on Computational Science, 2005.
- [A Case Study of Context Assumptions for Simulation Composability and Reusability](#), Michael Spiegel, Paul F. Reynolds, and David C. Brogan, Proc. of the Winter Simulation Conference (WSC), 2005.

# Publication

- [Simulation-Specific Characteristics and Software Reuse](#), Joseph C. Carnahan, Paul F. Reynolds, and David C. Brogan, Proc. of the Winter Simulation Conf.(WSC), 2005.
- [Exploring The Constraints of Human Behavior Representation](#), Giordano, J., Reynolds, P. and Brogan, D., 2004 ACM/IEEE Winter Simulation Conference.
- [Visualizing Coercible Simulations](#), Carnahan, J., Reynolds, P. and Brogan, D., 2004 ACM/IEEE Winter Simulation Conference.
- [Semantics, Scope, or Scale: Simulation Composability Versus Component-Based Software Design](#), Bartholet, R., Carnahan, J., Reynolds, P., Brogan, D., Fall '04 Simulation Interoperability Workshop
- [An Optimization-Based Multi-Resolution Simulation Methodology](#), Drewry, D., Reynolds, P. and Emanuel, W, ACM/IEEE 2002 Winter Simulation Conference.
- [Resolving Concurrent Interactions](#), A. Natrajan, and P.F. Reynolds, Jr., 3rd Distributed Simulation-Real Time Conference, 1999.

# Anita Jones



- Professor (joined 1988)
- Ph.D.: CMU (1973)
- Research Interest:
  - Distributed systems
  - High performance systems, computer simulation,
  - intrusion detection, survivable information systems, protection and security,
  - National science and engineering policy
- Project
  - Application Intrusion Detection

## Publication

- [Foundations of Secure Computation](#), Richard De Millo, Richard J. Lipton, Anita Jones and David Dobkin, Academic Press, 1978
- [A Language Extension for Expressing Constraints on Data Access](#), Barbara Liskov and Anita Jones, Communications of the ACM, 1978.
- [Software Management of Cm\\* - a Distributed Multiprocessor](#), Anita Jones, Robert J. Chansler, Jr., Ivor Durham, Peter Feiler and Karsten Schwan, Proc. of the National Computer Conference, 1977.
- [HYDRA - the Kernel of a Multiprocessor Operating System](#), W. Wulf, E. Cohen, W. Corwin, A. Jones, R. Levin, C. Pierson, and F. Pollack, Communications of the ACM, 1974.
- [Secure Databases: Protection Against User Influence](#), David Dobkin, Richard Lipton, and Anita Jones, ACM Transactions on Database Systems, 1979.

## Kevin Sullivan



- Associate Professor
- Ph.D.: U. of Washington (1994)
- Research Interest:
  - Software engineering,
  - modular architectures,
  - survivability, evolution, and integration
- Project
  - Lava: The Laboratory for Computer Architecture at Virginia

## Publication

- [Improving Software Assurance by Bounded Exhaustive Testing](#), K. Sullivan, J. Yang, D. Coppit, S. Khurshid, D. Jackson, Inter. Symposium on Software Testing and Analysis (ISSTA), Boston, 2004.
- [Eos: Instance-Level Aspects for Integrated System Design](#), Hridesh Rajan and Kevin Sullivan, Proc. of Joint European Software Engineering Conf. and ACM Symposium on the Foundations of Software Engineering (ESEC/FSE) 2003, Helsinki, 2003.
- [Shared Semantic Domains for Computational Reliability Engineering](#), D. Coppit, R. Painter, and K. Sullivan, Inter. Symposium on Software Reliability Engineering, 2003.
- [Toward a Rigorous Definition of Survivability](#), J.C. Knight, E. Strunk, and K.J. Sullivan, DISCEX 2003,
- [Sound Methods and Tools for Engineering Modeling and Analysis](#), D. Coppit and K. Sullivan, Inter. Conf. on Software Engineering, 2003.
- [Nonmodularity in Aspect Languages: AspectJ as a Case Study](#), K.J. Sullivan, Yuanfang Cai and Lin Gu, First International Conference on Aspect-Oriented Software Development, 2002.
- [The Structure and Value of Modularity in Software Design](#), K.J. Sullivan, W.G. Griswold, Y. Cai and B. Hallen, Joint Proc. of the European Software Engineering/ACM SIGSOFT Foundations of Software Engineering Conference (ESEC/FSE), Vienna, 2001.

## Publication

- [An Architectural Aspect for the Emerging Computational Tapestry](#), K.J. Sullivan and A. Saxena, Inter. Conf. on Software Engineering, 2001.
- [Formal Semantics of Models for Computational Engineering: A Case Study on Dynamic Fault Trees](#), D. Coppit, K.J. Sullivan and J.B. Dugan, Inter. Symposium on Software Reliability Engineering, 2000
- [A benchmark for Quantitative Fault Tree Reliability Analysis](#), H. Zhu, S. Zhou, J.B. Dugan and K.J. Sullivan, Proc. of the Annual Reliability and Maintainability Symposium, 2001
- [COM Revisited: Tool-Assisted Modeling and Analysis of Complex Software Structures](#), D. Jackson and K.J. Sullivan, SIGSOFT 2000, ACM SIGSOFT International Symposium on the Foundations of Software Engineering.
- [Mass-Market Packages as Software Components](#), Coppit, D. and K.J. Sullivan, Proc. Inter. Conf. on Software Engineering, 2000.
- [Survivability Architectures](#), J.C. Knight, K.J. Sullivan, M. Elder, Proc. of DARPA Information Survivability Conference and Exposition (DISCEX), 2000

# Kevin Skadron



- Associate Professor (joined 1999)
- Ph.D.: Princeton University (1999)
- Research Interest:
  - Computer architecture,
  - Temperature-aware and power-aware computing, thermal modeling.
  - graphics architecture,
  - novel processor organizations and
  - simulation methodology

## Publication

- (multi-core architecture, power, thermal) [CMP Design Space Exploration Subject to Physical Constraints](#), Y. Li, B. C. Lee, D. Brooks, Z. Hu, and K. Skadron, Proc. of the IEEE Int'l Symposium on High Performance Computer Architecture, 2006.
- (thermal) [A Case for Thermal-Aware Floorplanning at the Microarchitectural Level](#), K. Sankaranarayanan, S. Velusamy, M.R. Stan, and K. Skadron, The Journal of Instruction-Level Parallelism, 2005.
- (thermal, reliability) [Temperature-Aware Microarchitecture: Modeling and Implementation](#), K. Skadron, K. Sankaranarayanan, S. Velusamy, D. Tarjan, W. Huang, and M. R. Stan. ACM Transactions on Architecture and Compiler Optimization, 2004.
- (branch-prediction) [Power-Aware Branch Prediction, Characterization and Design](#), D. Parikh, K. Skadron, Y. Zhang, and M. Stan, IEEE Transactions on Computers, 2004.
- (parameter variations, multicore, thermal, power, leakage) [The Impact of Systematic Process Variations on Symmetrical Performance in Chip Multi-processors](#), E. Humenay, D. Tarjan, and K. Skadron, In Proc. of the 2007 Conference on Design, Automation and Test in Europe (DATE).
- (reliability, thermal) [Interconnect Lifetime Prediction for Reliability-Aware Systems](#), Z. Lu, W. Huang, M. Stan, K. Skadron, and J. Lach, IEEE Transactions on VLSI Systems, 07
- (branch prediction, trace cache, power) [Evaluating Trace Cache Energy Efficiency](#), M. Co, D. A.B. Weikle, and K. Skadron, ACM Transactions on Architecture and Code Optimization (TACO), 06

## Publication

- (graphics architecture, reliability) [The Visual Vulnerability Spectrum: Characterizing Architectural Vulnerability for Graphics Hardware](#), J. W. Sheaffer, D. P. Luebke, and K. Skadron. In Proc. of Eurographics/ACM Graphics Hardware 2006.
- (power, branch prediction) [Using Branch Prediction Information for Near-Optimal I-Cache Leakage Reduction](#), S. W. Chung and K. Skadron, In Proc. of the 11th Asia-Pacific Systems Architecture Conference (ACSAC), 2006.
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- (thermal, graphics architecture) [Studying Thermal Management for Graphics-Processor Architectures](#), J. W. Sheaffer, K. Skadron, and D. P. Luebke. In Proceedings of the 2005 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS).
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# David Evans



- Associate Professor (joined 1999)
- Ph.D.: MIT (1999)
- Research Interest:
  - Inexpensive program analysis,
  - security
  - applied cryptography
- Project
  - LCLint: Annotation-Assisted Static Checking

# Publication

- [Statically Detecting Likely Buffer Overflow Vulnerabilities](#), David Larochelle and David Evans. In Proceedings of the 2001 USENIX Security Symposium.
- [Static Detection of Dynamic Memory Errors](#). David Evans. In SIGPLAN Conference on Programming Language Design and Implementation (PLDI '96)
- [LCLint: A Tool for Using Specifications to Check Code](#), David Evans, John Guttag, Jim Horning and Yang Meng Tan, IGSOFT Symposium on the Foundations of Software Engineering (FSE 94).
- [Policy-Directed Code Safety](#), David Evans and Andrew Twyman. In Proc. of the 1999 IEEE Symposium on Security and Privacy.
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- [Localization for Mobile Sensor Networks](#), Lingxuan Hu and David Evans. ACM MobiCom 2004.

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- [Security Issues and Requirements for Internet-Scale Publish-Subscribe Systems](#), Chenxi Wang, Antonio Carzaniga, David Evans, Alexander L. Wolf. In Hawaii Int'l Conf. on System Sciences.
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- [Where's the FEED?: The Effectiveness of Instruction Set Randomization](#), Ana Nora Sovarel, David Evans and Nathanael Paul, 14th USENIX Security Symposium, 05

# Kamin Whitehouse



- Assistant Professor
- Ph.D.: UC Berkley
- Research Interest:
  - Sensor networks focuses on programming interfaces to the user.

# Publication

- [Macro-calibration in Sensor/Actuator Networks](#). Mobile Networks and Applications Journal (MONET), 2003.
- [A Practical Evaluation of Radio Signal Strength for Ranging-based Localization](#). ACM Mobile Computing and Communications Review (MC2R), 2007.
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# Publication

- [Semantic Streams: a Framework for Composable Inference over Sensor Data](#). Kamin Whitehouse, Jie Liu, Feng Zhao. The Third European Workshop on Wireless Sensor Networks (EWSN), Switzerland. 2006
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# Westley Weimer



- Assistant Professor
- Ph.D.: UC Berkley (2005)
- Research Interest:
  - Software quality and reliability

# Publication

- [Patches as Better Bug Reports](#), Westley Weimer, In Proc. Inter. Conf. on Generative Programming and Component Engineering (GPCE '06).
- [Exception-Handling Bugs in Java and a Language Extension to Avoid Them](#), Westley Weimer, In C. Dony et al. (Eds.): Exception Handling, 2006.
- [Exceptional Situations and Program Reliability](#), Westley Weimer, PhD Thesis, University of California at Berkeley, Fall 2005.
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## Publication

- [Speeding Up Dataflow Analysis Using Flow-Insensitive Pointer Analysis](#), Stephen Adams, Thomas Ball, Manuvir Das, Sorin Lerner, Sriram K. Rajamani, Mark Seigle, Westley Weimer. Ninth Inter. Static Analysis Symposium (SAS '02).
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- [Cil: An Infrastructure for C Program Analysis and Transformation](#). George C. Necula, Scott McPeak, S. P. Rahul, Westley Weimer. Inter. Conf. on Compiler Construction (CC '02), France.
- [CCured: Type-Safe Retrofitting of Legacy Code](#). George C. Necula, Scott McPeak, Westley Weimer. In Proc. ACM Symposium on Principles of Programming Languages (POPL '02).
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## Sudhanva Gurumurthi



- Assistant Professor (joined 2005)
- Ph.D.: Pennsylvania State University (2005)
- Research Interest:
  - High-performance computer architectures,
  - Power management,
  - Storage systems

## Publication

- [Disk Drive Roadmap from the Thermal Perspective: A Case for Dynamic Thermal Management](#), S. Gurumurthi, A. Sivasubramaniam, and V. Natarajan, Proc. of the International Symposium on Computer Architecture (ISCA), June 2005
- [A Complexity-Effective Approach to ALU Bandwidth Enhancement for Instruction-Level Temporal Redundancy](#) A. Parashar, S. Gurumurthi and A. Sivasubramaniam, Proc. of the International Symposium on Computer Architecture (ISCA), 2004
- [DRPM: Dynamic Speed Control for Power Management of Server Class Disks](#), S. Gurumurthi, A. Sivasubramaniam, M. Kandemir and H. Franke, Proceedings of the International Symposium on Computer Architecture (ISCA), June 2003
- [Using Complete Machine Simulation for Software Power Estimation: The SoftWatt Approach](#), S. Gurumurthi, A. Sivasubramaniam, M.J. Irwin, N. Vijaykrishnan, M. Kandemir, T. Li and L.K. John, Proc. of the International Symposium on High Performance Computer Architecture (HPCA), 2002
- [Energy-Performance Trade-Offs for Spatial Access Methods on Memory Resident Data](#), N. An, S. Gurumurthi, A. Sivasubramaniam, N. Vijaykrishnan, M. Kandemir and M.J. Irwin, The VLDB Journal, 2002 (**Amongst 5 Best Papers of VLDB 2001**).

## Kim Hazelwood



- Assistant Professor (joined 2005)
- Ph.D.: Harvard University (2004)
- Research Interest:
  - Optimizing compilers
  - Computer architecture

## Publication

- [A Cross-Architectural Framework for Code Cache Manipulation](#), Kim Hazelwood and Robert Cohn, Int'l Symposium on Code Generation and Optimization (CGO-4),06
- [Improving Region Selection in Dynamic Optimization Systems](#), David Hiniker, Kim Hazelwood and Michael D. Smith, Int'l Symposium on Microarchitecture (MICRO-38),Spain,2005.
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- [SuperPin: Parallelizing Dynamic Instrumentation for Real-Time Performance](#), Steven Wallace and Kim Hazelwood. Int'l Symposium on Code Generation and Optimization (CGO), 07

## Publication

- [Heterogeneous Chip Multiprocessor Design for Virtual Machines](#), Dan Upton and Kim Hazelwood. Software Tools for Multicore Systems held in conjunction with the Int'l Symposium on Code Generation and Optimization, 2007.
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- [A Dynamic Binary Instrumentation Engine for the ARM Architecture](#), Kim Hazelwood and Artur Klauser, Int'l Conf. on Compilers, Architecture, and Synthesis for Embedded Systems (CASES), 2006
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- [Adaptive Online Context-Sensitive Inlining](#), Kim Hazelwood and David Grove, First Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO-03).
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## Marty Humphrey



- Assistant Professor (joined 1998)
- Ph.D.: U of Massachusetts, Amherst (1996)
- Research Interest:
  - Grid computing,
  - Security, real-time computation,
  - Operating systems
- Project
  - Legion: World-wide Virtual Computer

## Publication

- [Alternative Software Stacks for OGSA-based Grids](#), M. Humphrey, G. Wasson, Y. Kiryakov, S-M. Park, D. Del Vecchio, N. Beekwilder, and J. Gray, Proceedings of Supercomputing 2005.
- [Toward Seamless Grid Data Access: Design and Implementation of GridFTP on .NET](#), J. Feng, L. Cui, G. Wasson, and M. Humphrey, Proceedings of the 2005 Grid Workshop (Associated with Supercomputing 2005).
- [CredEx: User-Centric Credential Selection and Management for Grid and Web Services](#), D. Del Vecchio, J. Basney, N. Nagaratnam, and M. Humphrey, Proceedings of the 2005 IEEE International Conference on Web Services (ICWS 2005), 2005.
- [Security for Grids](#), M. Humphrey, M. Thompson, and K.R. Jackson, Proceedings of the IEEE (Special Issue on Grid Computing), 2005.
- [The University of Virginia Campus Grid: Integrating Grid Technologies with the Campus Information Infrastructure](#), M. Humphrey and G. Wasson, European Grid Conference (EGC 2005), Amsterdam, 2005.