

## Chandra Krintz

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### Vita:

Birth date: May 23, 1970  
Birthplace: Monticello, Indiana  
Gender: Female  
Citizenship: United States

### Research Interests:

My research focus centers in compilation, dynamically compiled languages (Java/CIL), and efficient, adaptive, execution using distributed and resource-constrained resources. My recent research builds upon and extends these techniques to enable Vertically Integrated VirtualizAtion (VIVA): set of techniques and methodologies that enable full-system performance specialization and optimization by exploiting emerging virtualization technologies. My other interests include projects and programs that mentor, support, and encourage young people from underrepresented groups (especially women!) to consider and pursue computer science.

### Education:

**University of California** **San Diego, CA**  
Doctor of Philosophy degree in Computer Science, May 2001  
Dissertation Title: Reducing Load Delay to Improve Performance of Internet-Computing Programs  
Available as UCSD Technical Report CS2001-0672  
Adviser: Brad Calder

**University of California** **San Diego, CA**  
Master of Science degree in Computer Science, June 1998

**California State University** **Northridge, CA**  
Bachelor of Science degree in Computer Science, December 1995  
Honors: School of Engineering Outstanding Undergraduate Award

### Professional Experience:

**University of California,** **Santa Barbara, CA**  
Associate Professor. (July 2007 - Present)

**University of California,** **Santa Barbara, CA**  
Assistant Professor. (July 2001 - June 2007)

### Peer-Reviewed Conference & Workshop Publications:

1. S. Soman and C. Krintz and L. Daynes, *MTM<sup>2</sup>: Scalable Memory Management for Multi-Tasking Managed Runtime Environments*, The European Conference on Object-Oriented Programming (ECOOP), July, 2008 (to appear)
2. M. Wegiel and C. Krintz, *XMem: Type-Safe, Transparent, Shared Memory for Cross-Runtime Communication and Coordination*, *Programming Language Design and Implementation (PLDI08)*, Jun, 2008 (to appear)
3. R. Wolski, S. Gurun, C. Krintz, and D. Nurmi, *Using Bandwidth Data to Make Computation Offloading Decisions*, High-Performance Grid Computing Workshop (HPGC'08) – **invited and peer reviewed**, as part of the International Conference on Parallel and Distributed Processing, Apr, 2008

4. M. Wegiel and C. Krintz, The Mapping Collector: Virtual Memory Support for Generational, Parallel, and Concurrent Compaction, *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, Mar, 2008
5. L. Zhang, C. Krintz, and P. Nagpurkar, Supporting Exception Handling for Futures in Java, *The International Conference on the Principles and Practice on Programming in Java (PPPJ)*, Sep, 2007
6. L. Zhang, C. Krintz, and P. Nagpurkar, Language and Virtual Machine Support for Efficient Fine-Grained Futures in Java, *The International Conference on Parallel Architectures and Compilation Techniques (PACT)*, Sep, 2007
7. P. Nagpurkar, H. Cain, M. Serrano, J. Choi, and C. Krintz, Call-chain Software Instruction Prefetching in J2EE Server Applications, *The International Conference on Parallel Architectures and Compilation Techniques (PACT)*, Sep, 2007
8. C. Grzegorzcyk, S. Soman, R. Wolski, and C. Krintz, Isla Vista Heap Sizing: Using Feedback to Avoid Paging, *International Symposium on Code Generation and Optimization (CGO)*, Mar, 2007
9. H. Mousa, C. Krintz, L. Youseff, and R. Wolski, VIProf: Vertically Integrated Full-System Performance Profiler, *Workshop on Next-Generation Software*, Mar, 2007
10. L. Youseff, R. Wolski, B. Gorda, and C. Krintz, Paravirtualization for HPC Systems, *XHPC: Workshop on XEN in High-Performance Cluster and Grid Computing*, Dec, 2006, **Won (Co-) Best Paper Award!**
11. L. Zhang, C. Krintz, and S. Soman, Efficient Support of Fine-grained Futures in Java, *International Conference on Parallel and Distributed Computing and Systems (PDCS)*, Nov, 2006
12. L. Youseff, R. Wolski, B. Gorda, and C. Krintz, Evaluating the Performance Impact of Xen on MPI and Process Execution For HPC Systems, *International Workshop on Virtualization Technologies in Distributed Computing (VTDC)*, Nov, 2006
13. S. Gurun and C. Krintz, A Run-Time, Feedback-Based Energy Estimation Model For Embedded Devices, *International Conference on Hardware-Software Codesign and System Synthesis (CODES+ISSS)*, Oct, 2006
14. Y. Wen, S. Gurun, N. Chohan, R. Wolski, and C. Krintz, SimGate: Full-System, Cycle-Close Simulation of the Stargate Sensor Network Intermediate Node, *International Conference on Embedded Computer Systems: Architectures, Modeling, and Simulation (IC-SAMOS)*, Jul, 2006
15. S. Soman, L. Daynes, C. Krintz, Task-Aware Garbage Collection in a Multi-Tasking Virtual Machine, *ACM International Symposium for Memory Management (ISMM)*, Jun, 2006
16. S. Soman and C. Krintz, Efficient and General On-Stack Replacement for Aggressive Program Specialization, *International Conference on Programming Languages and Compilers (PLC)*, Jun, 2006
17. P. Nagpurkar, C. Krintz, M. Hind, P. Sweeney, and V.T. Rajan, Online Phase Detection Algorithms, *ACM International Symposium on Code Generation and Optimization (CGO)*, Mar, 2006
18. C. Krintz and S. Gurun, Remote Performance Monitoring, *Dagstuhl Seminar Proceedings – Schloss Dagstuhl Workshop on Automatic Performance Analysis*, Apr, 2005
19. S. Gurun and C. Krintz, AutoDVS: An Automatic, General-Purpose, Dynamic Clock Scheduling System for Hand-Held Devices, *ACM SIGBED International Conference on Embedded Systems Software (EMSOFT)*, Sep, 2005
20. H. Mousa and C. Krintz, HPS: Hybrid Profiling Support, *ACM SIGARCH International Conference on Parallel Architectures and Compilation Techniques (PACT)*, Sep, 2005

21. C. Krintz and R. Wolski, Using Phase Behavior in Scientific Application to Guide Linux Operating System Customization, *Workshop on Next Generation Software at IPDPS*, Apr, 2005
22. P. Nagpurkar, C. Krintz, and T. Sherwood, Phase-Aware Remote Profiling, *2005 International Symposium on Code Generation and Optimization (CGO)*, Mar, 2005
23. S. Soman, C. Krintz, and D. Bacon, Dynamic Selection of Application-specific Garbage Collectors, *International Symposium for Memory Management (ISMM)*, Oct, 2004
24. C. Krintz, Y. Wen, and R. Wolski, Application-level Prediction of Battery Dissipation, *ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED)*, Aug, 2004
25. L. Zhang and C. Krintz, Adaptive Code Unloading for Resource-Constrained JVMs, *ACM SIGPLAN Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES)*, Jun, 2004
26. P. Nagpurkar and C. Krintz, Visualization and Analysis of Phased Behavior in Java Programs, *ACM International Conference on the Principles and Practice of Programming in Java (PPPJ)*, Jun, 2004
27. L. Zhang and C. Krintz, Profile-driven Code Unloading for Resource-Constrained JVMs, *ACM International Conference on the Principles and Practice of Programming in Java (PPPJ)*, Jun, 2004
28. S. Gurun, C. Krintz, and R. Wolski, NWSLite: A Light-Weight Prediction Utility for Mobile Devices, *International Conference on Mobile Systems, Applications, and Services (MobiSys)*, Jun, 2004
29. Y. Wen, R. Wolski, and C. Krintz, History-based, Online, Battery Lifetime Prediction for Embedded and Mobile Devices, *Workshop on Power-Aware Computer Systems (PACS)*, Dec, 2003
30. S. Soman, C. Krintz, and G. Vigna, Detecting Malicious Java Code Using Virtual Machine Auditing, *12th USENIX Security Symposium*, Aug, 2003
31. S. Sucu and C. Krintz, ACE: A Resource-Aware Adaptive Compression Environment, *International Conference on Information Technology: Coding and Computing (ITCC03)*, Apr, 2003
32. C. Krintz, Coupling On-Line and Off-Line Profile Information to Improve Program Performance, in the: *International Symposium on Code Generation and Optimization*, (CGO03), Mar, 2003
33. C. Krintz, Improving Mobile Program Performance Through the Use of a Hybrid Intermediate Representation, *Workshop on Intermediate Representation Engineering (IRE02)*, Jun, 2002
34. C. Krintz, Using Adaptive Optimization Techniques To Teach Mobile Java Computing, *Principles and Practice of Programming in Java (PPPJ02)*, Jun, 2002
35. C. Krintz and B. Calder, Dynamic Selection of Compression Formats to Reduce Transfer Delay, *High-Performance Distributed Computing (HPDC01)*, Aug, 2001
36. C. Krintz and B. Calder, Using Annotation to Reduce Dynamic Optimization Time, *Programming Language Design and Implementation (PLDI01)*, Jun, 2001
37. C. Krintz and R. Wolski, NwsAlarm: A Tool for Accurately Detecting Resource Performance Degradation, *IEEE/ACM Symposium on Cluster Computing and the Grid (CCGRID2001)*, May 2001
38. C. Krintz and R. Wolski, JavaNws: The Network Weather Service for the Desktop, *Java-Grande*, Oct, 2000
39. C. Krintz, B. Calder, and U. Hölzle, Reducing Transfer Delay Using Java Class File Splitting and Prefetching, *14th Annual ACM SIGPLAN Conference on Object-Oriented Programming Systems, Languages, and Applications (OOPSLA99)*, Nov, 1999

40. R. Wolski, J. Brevik, C. Krintz, G. Obertelli, N. Spring, and A. Su, Running EveryWare on the Computational Grid, *Supercomputing* (SC99), Oct, 1999
41. C. Krintz, B. Calder, H. B. Lee, and B. Zorn, Overlapping Execution with Transfer Using Non-Strict Execution for Mobile Programs, *International Conference on Architectural Support for Programming Languages and Operating Systems* (ASPLOS), Oct, 1998
42. B. Calder, C. Krintz, S. John, and T. Austin, Cache-Conscious Data Placement, *International Conference on Architectural Support for Programming Languages and Operating Systems* (ASPLOS), Oct, 1998
43. C. Krintz and S. Fitzgerald, AGAVE: A Visualization Tool for Parallel Programming, In Proceedings of *International Association of Science and Technology for Development Conference* (IASTED95), Oct, 1995

#### Peer-Reviewed Journal Publications:

1. S. Gurun, D. Nurmi, R. Wolski, and C. Krintz, On the Efficiency of Computation Offloading Decision Making Strategies, To Appear: *International Journal of High Performance Computing Applications*, 2008
2. S. Gurun and C. Krintz, NWSLite: A General-purpose, Non-parametric Prediction Utility for Embedded Systems, *ACM Transactions on Embedded Systems (TECS)*, Vol. 80, Issue 7, pp 1037-1056, April, 2008
3. Y. Wen, S. Gurun, N. Chohan, R. Wolski, and C. Krintz, Accurate and Scalable Simulation of Network of Heterogeneous Sensor Devices, *Journal of Signal Processing Systems*, Volume 50, Number 2, February, 2008
4. S. Soman and C. Krintz, Application-specific Garbage Collection, *Journal of Systems and Software* Volume 80, Issue 7, pp. 1037-1056, July, 2007
5. P. Nagpurkar, H. Mousa, C. Krintz, and T. Sherwood, Efficient Remote Profiling for Resource-Constrained Devices, *ACM Transactions on Architecture and Code Optimization (TACO)*, Vol. 3, Number 1, Mar, 2006, pp 1-32
6. P. Nagpurkar and C. Krintz, Phase-Based Visualization and Analysis of Java Programs, *Elsevier Science of Computer Programming – Special Issue on Principles Practices and Programming in Java*, Vol. 59, Number 1-2, Jan, 2006, pp 64-81
7. C. Krintz and S. Sucu, Adaptive On-The-Fly Compression, *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, Vol. 17, Number 1, Jan, 2006, pp 15-24
8. L. Zhang and C. Krintz, The Design, Implementation, and Evaluation of Adaptive Code Unloading for Resource-Constrained Devices, *ACM Transactions on Architecture and Code Optimization (TACO)*, Vol. 2, Number 2, Jun, 2005, pp 131-164
9. Y. Wen, R. Wolski, and C. Krintz, Online Prediction of Battery Lifetime for Embedded and Mobile Devices, *Special Issue on Embedded Systems: Lecture Notes in Computer Science (LNCS)*; Springer-Verlag, V3164/2004, Dec, 2004
10. C. Krintz, D. Grove, V. Sarkar, and B. Calder, Reducing the Overhead of Dynamic Compilation, *Journal of Software: Practice and Experience*, Volume 31, Issue 8, Dec, 2000, pp 717-738
11. C. Krintz and R. Wolski, Using JavaNws to Compare C and Java TCP-socket Performance, Special issue of the *Journal of Concurrency and Computation: Practice and Experience*, Volume 13, Issue 8-9, Jun, 2001, pp 815-859

#### Book Chapters:

1. C. Krintz, Improving Mobile Program Performance Through the Use of a Hybrid Intermediate Representation, *Recent Advances in Java Technology: Theory, Application, Implementation*, Chapter 26, Computer Science Press, Trinity College Dublin, J. Power and J. Waldron Eds., Nov, 2002, pp 224-232

2. C. Krantz, Using Adaptive Optimization Techniques To Teach Mobile Java Computing, *Recent Advances in Java Technology: Theory, Application, Implementation*, Chapter 7, Computer Science Press, Trinity College Dublin, J. Power and J. Waldron Eds., Nov, 2002 pp 63-69

#### **Invited Talks (Past 2 Years):**

- Efficient, Type-Safe Shared Memory for Cross-MRE Communication and Coordination; Colloquium at Boston University, April 4th, 2008
- **Diversity:** Balancing Work and Life/Time Management CRA-W Mentoring Workshop, Invited Speaker, June 2007, with FCRC
- **Diversity:** Information Technology and the Community (UCSB course for undergraduates on outreach to the community (local non-profits and high-schools). Introduce young people to computer science and to impact our local community through information technology support and education (<http://www.cs.ucsb.edu/~ckrantz/classes/cs193/>). Winter Quarter 2007 UCSB
- **Diversity:** On Being a Female Academic in Computer Science Pt. Loma University CS/IS Undergraduate Workshop, Invited Panelist, Apr, 2006.
- **Diversity:** Finding Balance in Computer Science Careers CRA-W Cohort Workshop, Invited Talk, Mar, 2006.

#### **Service & Professional Activities (Past 2 Years):**

- **Diversity:** 2007-08 Academic Year: Microsoft+UCSB – using Boku to introduce Girls Inc. (<http://www.girlsincsb.org/>) students to programming and computer science. Lead w/ 12 undergraduate students (Boku advocates).
- Elected Member: ACM Special Interest Group on Programming Languages (SIGPLAN) Executive Committee - Vice Chair 2007-2009 (With position: Steering committee member: PLDI, POPL, OOPSLA, ICFP, AOSD)
- CRA-W Mentoring Workshop 2007 Invited Speaker (June 2007, San Diego with FCRC 2007)
- General Chair for the 2007 ACM International Conference on Virtual Execution Environments (VEE) at FCRC 2007
- CRA-W Cohort 2006 Workshop Speaker
- Program Chair for the 2006 Conference on Principles and Practices of Programming in Java (PPPJ)
- Elected Member: ACM Special Interest Group on Programming Languages (SIGPLAN) Executive Committee Member-At-Large 2005-2007
- ACM SIGPLAN Treasurer 2005-2007
- ACM SIGPLAN Professional Activities Committee Co-Chair (sponsoring graduate student travel to SIGPLAN events) 2005-2007
- Steering Committee Member for the 2006 International Workshop on Implementation, Compilation, Optimization of Object-Oriented Languages, Programs and Systems (ICOOOLPS)
- Member: Association for Computing Machinery (ACM); ACM Special Interest Group on Programming Languages (SIGPLAN);
- Membership in Computer Science Departmental Committees: Undergraduate Curriculum Affairs (Chair 07-08), Graduate Student Affairs, Graduate Admissions, Faculty Recruitment, Diversity, Computer Engineering, Computer Engineering Long-Range Planning Committee, and others.
- Publications Chair: ACM Conference on Code Generation and Optimization (CGO) 2005

- Program Committee Member: LCTES04, CGO04, VEE05, MSP05, PACT05, ISMM06, LCTES06, GraceHopper06, IC00OLPS06, HiPEAC07, CGO07, ISMM07, ASPLOS08, CGO08, PPOPP09, PLDI09, ASPLOS09

**Grants:**

- Defense University Research Instrumentation Program (DURIP): Large-Scale Multimodal Wireless Sensor Network, Dept. of Defense, FY08-FY11, C. Krintz, Co-PI
- NETS/NOSS: SENSIMIDE: Integrated Software Development and Multi-Mode Simulation for Large-Scale Sensor Networks, NSF FY06-FY09, C. Krintz, Co-PI
- Microsoft Phoenix Award, Microsoft Research FY06-FY07, C. Krintz, PI
- CAREER: VIVA – Vertically Integrated VirtualizAtion: Automatic, Full System, Specialization for High-End Computing, NSF FY06-FY11, C. Krintz, PI
- Microsoft Phoenix Award, Microsoft Research FY05-FY06, C. Krintz, PI
- ST-HEC: Automatic Linux Customization and Optimization for High-Performance Scientific Applications, NSF FY04-FY07, C. Krintz, PI
- Wireless Sensor Network Laboratory Infrastructure, NSF FY04 - FY06, C. Krintz, Co-PI
- NGS: Developing a Resource-Aware Adaptive Compilation System for High-Performance Distributed Computing, NSF Next Generation Software, FY02 - FY03, C. Krintz, Co-PI
- Annotation-Based Optimizations for Java Virtual Machines, Intel Corporation / UC-MICRO, FY03-FY05, C. Krintz, PI
- ITR: Virtual Power for a Wireless Campus - A Vision of Ubiquitous Computing On Low-Cost Mobile Devices, NSF (CCR-0205712), FY02 - FY05, C. Krintz, Co-PI
- Empirical Evaluation of IPF Optimizations, Intel Corporation, FY02-FY04, C. Krintz, PI

**Awards:**

- 2008 CRA-W Anita Borg Early Career (BECA) Award for outstanding research and outreach contributions
- 2008 Outstanding Faculty in Computer Science (co-award) for teaching excellence
- Microsoft Phoenix Award, Microsoft Research FY06-FY07, C. Krintz, PI (also listed under grants above)
- CAREER: VIVA – Vertically Integrated VirtualizAtion: Automatic, Full System, Specialization for High-End Computing, NSF FY06-FY11, C. Krintz, PI (also listed under grants above)
- Microsoft Phoenix Award, Microsoft Research FY05-FY06, C. Krintz, PI (also listed under grants above)

**Number of PhD Advisees:** 5

**Number of Graduated PhD Advisees:** 4

**Number of Graduated MS Advisees:** 8

**Number of Graduated Undergraduate Advisees:** 4 (+2 BS/MS)

**Number of Undergraduate Advisees:** 13