

Computer and Information Science Department
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Research Interests

My broader research interests are in programming languages, compilers, computer architecture and software systems. My specialized interests include dynamic analysis and dynamic enforcement of memory safety properties, concurrency bug detection, and verified compilers.

Education

- 2012 **PhD in Computer Science (Expected)**
University of Pennsylvania, Philadelphia, PA
Dissertation: Comprehensive Memory Safety for C/C++ Programs
Advisor: Prof Milo M K Martin
- 2007 **Masters of Science & Engineering in Computer Science**
Indian Institute of Science, Bangalore, India
Thesis: Spill Code Minimization and Buffer and Code Size Aware Instruction
Scheduling Techniques
Advisor: Prof R Govindarajan
- 2005 **Bachelors of Engineering in Computer Science**
National Institute of Technology, Karnataka, Surathkal, India
GPA: 4.0 **University Gold Medalist**

Honors and Awards

- 2010 **IEEE MICRO Top Picks Award:**
iCFP: Tolerating All-Level Cache Misses in In-Order Processors
- 2005-2007 **Philips Research Fellowship** by Philips Research and IISc
- 2001-2005 **University Gold Medal**, NIT Karnataka Surathkal:
A gold medal is awarded to the academic topper from each major
- 2005 **Best “Outgoing Student”** of Computer Engineering, NIT Karnataka Surathkal

Positions Held

- 2007- **Graduate Research Assistant**
Computer and Information Science Department, University of Pennsylvania
- 2009 **Research Intern**
Software Reliability Research, Microsoft Research Redmond
- 2005-2007 **Graduate Research Assistant**
Computer Science Department, Indian Institute of Science

Refereed Journal Publications

Top Picks'10 *iCFP: Tolerating All Level Cache Misses in In-Order Processors.*
Andrew Hilton, **Santosh Nagarakatte** and Amir Roth
In IEEE Micro Top Picks of Architecture Conferences of 2009, January, 2010

Refereed Conference Publications

- PLDI 2012 *Multicore Acceleration of Priority-Based Schedulers for Concurrency Bug Detection.*
Santosh Nagarakatte, Sebastian Burckhardt, Milo M K Martin and Madanlal Musuvathi.
(To Appear) Proceedings of the 33rd ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI), 2012
- ISCA 2012 *Watchdog: Hardware Support for Safe and Secure Manual Memory Management.*
Santosh Nagarakatte, Milo M K Martin and Steve Zdancewic
(To Appear) Proceedings of the 39th International Symposium on Computer Architecture (ISCA), 2012.
- POPL 2012 *Formalizing the LLVM Intermediate Representation for Verified Program Transformations.*
Jianzhou Zhao, **Santosh Nagarakatte**, Milo M K Martin and Steve Zdancewic
Proceedings of the 39th ACM SIGACT-SIGPLAN Symposium on Principles of Programming Languages (POPL), 2012.
- ISMM 2010 *CETS: Compiler Enforced Temporal Memory Safety for C.*
Santosh Nagarakatte, Jianzhou Zhao, Milo M K Martin and Steve Zdancewic
Proceedings of the ACM SIGPLAN International Symposium on Memory Management (ISMM), 2010.
- ASPLOS 2010 *A Randomized Scheduler with Probabilistic Guarantees of Finding Bugs.*
Sebastian Burckhardt, Pravesh Kothari, Madanlal Musuvathi and **Santosh Nagarakatte**
Proceedings of the 15th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2010
- PLDI 2009 *SoftBound: Highly Compatible and Complete Spatial Memory Safety for C.*
Santosh Nagarakatte, Jianzhou Zhao, Milo M K Martin and Steve Zdancewic
Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI), 2009
- HPCA 2009 *iCFP: Tolerating All Level Cache Misses in In-Order Processors.*
Andrew Hilton, **Santosh Nagarakatte** and Amir Roth
Proceedings of the 15th International Conference on High Performance Computer Architecture (HPCA), 2009
- CC 2007 *Register Allocation and Optimal Spill Code Scheduling in Software Pipelined Loops using 0-1 Integer Linear Programming Formulation.*
Santosh Nagarakatte and R Govindarajan
Proceedings of the 16th International Conference on Compiler Construction (CC), 2007.

Conference Papers in Submission/Preparation

Nov 2011 *Mechanized Verification of SSA-Based Optimizations.*

Jianzhou Zhao, **Santosh Nagarakatte**, Milo M K Martin and Steve Zdancewic

In Submission.

Teaching Experience

Fall 2011	Guest Lecture at the University of Pennsylvania CIS 800 (Rigorous Internet Protocol Engineering) On Mace and Model Checking Protocols
Fall 2010	Guest Lecture at the University of Pennsylvania CIS 501 (Computer Architecture) On Superscalar Processors and Virtual Memory
Spring 2009	Teaching Assistant at the University of Pennsylvania CIS 371 (Digital Systems Organization and Design)
Fall 2008	Teaching Assistant at the University of Pennsylvania CIS 501 (Computer Architecture)

Patent Applications

- *Concurrency Software Testing with Probabilistic Bounds on Finding Bugs.* Sebastian Burckhardt, Pravesh Kothari, Madanlal Musuvathi and Santosh Ganapati Nagarakatte, Submitted to the USPTO, Filing Date: December 1, 2009, Application number: 12/628,223

Professional Activities and Service

- Reviewer for the conferences: MICRO-2011, ASPLOS-2011, ICS-2008, PACT-2006
- ACM Student Member since 2008
- Organized the Architecture and Compilers Reading Group from Spring 2010-present.
- Organized the Program Synthesis Reading Group from September 2010-December 2010.

Personal Information

- Indian Citizen, on a F-1 visa
- Born November 7, 1983, Ankola, Karnataka, India
- Avid squash player

References for Santosh Nagarakatte

1. Dr. Milo M K Martin
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2. Dr Steve Zdancewic
Associate Professor
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3. Dr Emery Berger
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University of Massachusetts, Amherst
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4. Dr Rajeev Alur
Zisman Family Professor
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Email: alur@cis.upenn.edu
5. Dr Madanlal Musuvathi
Senior Researcher
Microsoft Research
Email: madanm@microsoft.com