John D. Demme, Ph.D.

(908) 627-2812 jdd@cs.columbia.edu

Education

Columbia University Graduate School of Arts and Sciences, New York
Ph.D. Computer Science **January 2010 – February 2014**
"Overcoming the Intuition Wall: Measurement and Analysis in Computer Architecture"
Advisor: Prof. Simha Sethumadhavan

Columbia University Graduate School of Arts and Sciences, New York
M.Phil. Computer Science **January 2010 – May 2012**

Columbia University Fu Foundation School of Engineering & Applied Science, New York
M.S. Computer Science **August 2008 – February 2010**
"λSignatures: Function Profiling and Similarity Analysis for Reducing Compiler Design Effort"
Advisor: Prof. Simha Sethumadhavan

A. James Clark School of Engineering, University of Maryland, College Park
B.S. In Computer Engineering **August 2004 – December 2007**

Publications

- "*Side-Channel Vulnerability Metrics: SVF vs. CSV*"
  John Demme and Simha Sethumadhavan
  11th Annual Workshop on Duplicating, Deconstructing and Debunking, Minneapolis, MN, June 2014
- "*A Reconfigurable Fabric for Accelerating Large-Scale Datacenter Services*"
  Andrew Putnam, [long author list omitted], John Demme, […], Doug Burger
  41th International Symposium on Computer Architecture, Minneapolis, MN, June 2014
- "*On the Feasibility of Online Malware Detection with Performance Counters*"
  John Demme, Matthew Maycock, Jared Schmitz, Adrian Tang, Adam Waksman,
  Simha Sethumadhavan, and Salvatore Stolfo
  40th International Symposium on Computer Architecture, Tel-Aviv, Israel, June 2013
- "*A Quantitative, Experimental Approach to Measuring Side-Channel Security"*
  John Demme, Robert Martin, Adam Waksman, and Simha Sethumadhavan
  IEEE Micro, Top Picks Special Issue, May 2013
- "*Side-channel Vulnerability Factor: A Metric for Measuring Information Leakage*"
  John Demme, Robert Martin, Adam Waksman, and Simha Sethumadhavan
  39th International Symposium on Computer Architecture, Portland, Oregon, June 2012
- "*TimeWarp: Rethinking Timekeeping and Performance Monitoring Mechanisms to Mitigate Side-Channel Attacks*"
  Robert Martin, John Demme, and Simha Sethumadhavan
  39th International Symposium on Computer Architecture, Portland, Oregon, June 2012
- "*Approximate Graph Clustering for Program Characterization*"
  John Demme and Simha Sethumadhavan
  ACM Transactions on Architecture and Code Optimization, January 2012
- "*Rapid Identification of Architectural Bottlenecks via Precise Event Counting*"
  John Demme and Simha Sethumadhavan
  38th International Symposium on Computer Architecture, San Jose, CA, June 2011
- *"COMPASS: A Community-driven Parallelization Advisor for Sequential Software"*
  Simha Sethumadhavan, Nipun Arora, Ravindra Babu Ganapathi, John Demme and Gail E. Kaiser
  Second International Workshop on Multicore Software Engineering, Vancouver, BC, May 2009
- *"I, Robot, Architect"* (not peer reviewed)
  John Demme and Simha Sethumadhavan. Wild and Crazy Ideas VII, Washington, DC, March 2009

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Talks and Presentations

- "*Side-Channel Vulnerability Metrics: SVF vs. CSV*"
  John Demme and Simha Sethumadhavan, WDDD 2014, Minneapolis, Minnesota
- *"Hardware Malware Detectors",*
  John Demme, Matthew Maycock, Jared Schmitz, Adrian Tang, Adam Waksman, Simha Sethumadhavan, Salvatore Stolfo, ISCA 2013, Tel-Aviv
- *"Side-channel Vulnerability Factor: A Metric for Measuring Information Leakage"*
  John Demme, Robert Martin, Adam Waksman, and Simha Sethumadhavan, ISCA 2012, Portland, Oregon
- "*Approximate Graph Clustering for Program Characterization*",
  John Demme and Simha Sethumadhavan. HiPEAC 2012, Paris, France
- *"Rapid Identification of Architectural Bottlenecks via Precise Event Counting"*
  John Demme and Simha Sethumadhavan, ISCA 2011, San Jose, California
- "*I, Robot, Architect*",
  John Demme and Simha Sethumadhavan. Wild and Crazy Ideas 2009, Washington, DC

Professional Service

- Program Committee, IEEE International Symposium On High Performance Computer Architecture 2015
- External Reviewer, IEEE/ACM International Symposium on Microarchitecture, 2014
- External Reviewer, IEEE International Symposium On High Performance Computer Architecture 2014
- Reviewer, ACM Transactions on Architecture and Code Optimization 2013
- Reviewer, Springer Distributed and Parallel Databases 2013
- Reviewer, IEEE International Parallel and Distributed Processing Symposium 2010
- Reviewer, IEEE Micro Magazine 2010, 2011

Professional Skills

- Systems programming & design: C, C++, Linux kernel hacking, firmware
- Embedded systems design & programming: PCB design, electrical system design, embedded C
- Computer hardware design: Verilog, SystemVerilog, FPGA bitware design & programming
- Miscellaneous programming and software engineering skills: Python, Haskell, Machine Learning, etc.

Awards and Honors

- 2010 Andrew P. Kosoresow Memorial Award for Outstanding Performance in TA-ing and Service
- 2010 NSF Graduate Research Fellowship Honorable Mention

Technical Service

- Code contributor, *GNU GDB* — Symbol demangler for D language
- Code contributor, *Mango Project* — XML SAX, DOM, XML-RPC client/server and collections libraries
- Author, *LiMiT Project* — Lightweight performance counter access for Linux

Teaching Experience

- Teaching Assistant, Database Systems Implementation, Spring 2011
- Teaching Assistant, Parallel Computer Architecture, Spring 2011
- Private Tutor, Introductory Computer Programming, Fall 2002

Outreach

- President, *UM Linux Users Group* — **2005 – 2007**
- Member, *UM Linux Users Group* — **2004 – 2008**
- Member, *UMD ACM International Collegiate Programming Contest Team* — **2006 – 2007**
- Volunteer Emergency Medical Technician, *Montgomery EMS* — **2002 – 2005**
- Advisor, *Cougar Robotics—FIRST Robotics Team 1403* — **2003**

Research Experience

Associate Research Scientist **March 2014 – Current**
Computer Architecture and Security Technologies Lab, Columbia University
Research topics: hardware design methodologies, computer harware security

Graduate Research Assistant
Computer Architecture and Security Technologies Lab, Columbia University
Advisor: Dr. Simha Sethumadhavan, simha@cs.columbia.edu **January 2009 – February 2014**
Research topics: program analysis & characterization, computer hardware security.

Undergraduate Research Project, University of Maryland, College Park
Advisor: Dr. Amol Deshpande, amol@cs.umd.edu **Fall 2007**
Research topics: database systems

Professional Experience

Microsoft Research **2013**
Supervisor: Doug Burger, dburger@microsoft.com
Summer internship working in computer architecture group at Microsoft Research. Details of project are under NDA, though some can be found in our publication "A Reconfigurable Fabric for Accelerating Large-Scale Datacenter Services".

Putnam Engineering www.putnamengineering.com **2006 – 2012**
Contact: Charlie Putnam, cputnam@putnamengineering.com
Lead software and electrical engineer on machining automation product development team. Work included circuit and printed circuit board design, development of machining algorithms and routines, and software development for embedded processors using both assembly and C.

Techno-Sciences, Inc www.technosci.com **2008**
Contact: Bill English, englishw@technosci.com
Re-designed and re-factored prototype code used in production systems currently deployed in Southeast Asia. Integrated various maritime monitoring and communication systems including optical, radar, satellite communications and long-range radio. Responsibilities included travel to Jakarta, Indonesia to assist system installs.

AdaptiveBlue www.adaptiveblue.com **2006**
Contact: Alex Iskold, alex.iskold@adaptiveblue.com
Worked on Firefox plugin "BlueOrganizer". Wrote parsers to extract semantic information from websites. Implemented interfacing and storage software using Amazon S3 as early adopter of cloud computing technologies. Participated in overall product design.

CADCode Systems www.cadcode.com **2002 – 2007**
Contact: Ned Brown, President, ned@cadcode.com
Installed and maintained IT infrastructure. Developed custom customer relations management solution and web-based software licensing system. Moved large amounts of server software to Linux and F/OSS.

Freelance Software Development **2000 – 2005**
Designed and implemented web sites and custom software for clients. Implementations included custom content management system and plug-in for hardware interfacing.