

YATIN AVDHUT MANERKAR

PhD Student, Princeton University

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RESEARCH INTERESTS

- Memory consistency models and verification of their enforcement
- Cache coherence protocols, dark silicon, and heterogeneous multicores

EDUCATION

PhD, Computer Science (September 2014 – Present)

Princeton University, Princeton NJ, USA

- Advised by Prof. Margaret Martonosi
- Researching techniques to statically verify that a microarchitecture correctly enforces all the orderings required by its consistency model.
- **Other Projects**
 - Compressing Cached Rules in SDN – Researched compression algorithms to increase cache hit rates for large frequently-changing rule sets in software-defined networks.
 - Distributed Cache Prefetching – Part of a team that researched techniques to communicate prefetching data between cores to expedite the learning process of prefetchers in a multicore system.

Master of Science (Cumulative GPA: 8.5/9.0)

Computer Science and Eng., University of Michigan, Ann Arbor MI, USA (Sept. 2011 – May 2013)

- **Computational Sprinting Project:** Researched the thermal limits and sprinting potential of consumer-level mobile phones over two semesters
- TA for Programming and Introductory Data Structures course for 4 semesters
- **Other Projects**
 - Scheduling on Heterogeneous Multicores – Researched the use of various hardware-based metrics to make scheduling decisions on ARM big.LITTLE-like heterogenous multicores.
 - Out-of-order Processor in Verilog – As part of a group of 4, coded an out-of-order processor in Verilog, including design, development, and verification of proper operation.
 - Compiler for Loadless Architecture – Programmed part of a basic compiler for an architecture without regular load instructions using the LLVM compiler infrastructure.

Bachelor of Applied Sciences (Cumulative Avg.: 94.65/100)

Honours Computer Eng. (Co-op), University of Waterloo, Waterloo ON, Canada (Sept. 2006 - June 2011)

- Graduated with two years work experience as part of the university's co-op education system
- **Relevant Projects**
 - Fourth Year Design Project – Part of a group which designed and implemented DataDen, a redundant storage solution that offers configurable redundancy levels and can handle drives of various sizes in a single array.
 - Undergraduate Research Project - Expanded the design of a hard real-time architecture with VLIW and compiler mechanisms to improve performance while maintaining predictability.

PUBLICATIONS

- **Yatin A. Manerkar**, Daniel Lustig, Margaret Martonosi, and Michael Pellauer. RTLCheck: Verifying the Memory Consistency of RTL Designs. The 50th Annual IEEE/ACM International Symposium on Microarchitecture (MICRO), October 2017.

- Caroline Trippel, **Yatin A. Manerkar**, Daniel Lustig, Michael Pellauer, and Margaret Martonosi. TriCheck: Memory Model Verification at the Trisection of Software, Hardware, and ISA. The 22nd International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), April 2017.
- **Yatin A. Manerkar**, Daniel Lustig, Michael Pellauer, and Margaret Martonosi. CCICheck: Using μ hb Graphs to Verify the Coherence-Consistency Interface. The 48th Annual IEEE/ACM International Symposium on Microarchitecture (MICRO), Dec 2015. **Nominated for Best Paper.**

RECENT WORK EXPERIENCE

Co-op Engineer, AMD Research, Bellevue, WA, June 2015 – October 2015

- Explored the scalability and efficiency of AMD's remote-scope-promotion technology

Engineer, Qualcomm Incorporated, San Diego, CA, July 2013 – July 2014

- Wrote firmware and kernel-level code for embedded platform used in LTE research

Interim Engineering Intern, Qualcomm Innovation Center, San Diego, CA, May 2012 – August 2012

- Worked on the Linux kernel team
- Migrated an API for inter-processor communication on Snapdragon chips to use the Linux device model for event handling and `virtio` for data transfer while maintaining legacy API support

Software Development Engineer Intern, Amazon.com, Seattle, WA, September 2010 – December 2010

- Worked on the Amazon Web Services Billing Team
- Designed and developed two persistent storage implementations (BerkeleyDB and MySQL) of an in-memory object structure and integrated these implementations with a larger system

Browser Developer Co-op, Research in Motion (BlackBerry), Waterloo, ON, Canada

January 2009 – May 2009 and September 2009 – December 2009

- Found and fixed bugs (sometimes complicated ones) in the BlackBerry Browser's JavaScript, DOM, and layout implementation
- Worked on optimizing parts of the browser to improve performance
- Modified parts of the browser to comply with the HTML 5 specification

AWARDS AND SCHOLARSHIPS

- 2016 – Awarded 3rd place (tied) for demo (team project) at the C-FAR Annual Review
- 2010, 2011 – Awarded (2) Upper Year Scholarships by University of Waterloo Engineering
- 2010 – Awarded President's International Experience Award by University of Waterloo
- 2010 – Awarded President's Research Award by University of Waterloo
- 2006-2011 – Term Dean's Honours List in all 8 academic terms at University of Waterloo
- 2006 – Awarded President's Scholarship of Distinction and Nortel Networks Undergraduate Scholarship by the University of Waterloo

SKILLS SUMMARY

- Knowledge of C/C++, Java (SE/ME/EE), Coq, HTML, JavaScript, CSS, C#, databases (SQL Server, BerkeleyDB, MySQL) and some Verilog, OCaml, R, PHP, AJAX, and gem5 (simulator)
- Over three years work experience in software development, including desktop & web applications, large codebases, and high-visibility products (Linux Kernel, Amazon Web Services)
- Experience programming a variety of software, including operating systems, firmware, parsers, browser layout and JavaScript engines, user interfaces, and a subnet calculator in high school
- Knowledge of routers, switches, routing protocols, VLANs, OSI and TCP/IP models, and Cisco IOS. Held CCNA (Cisco Certified Network Associate) certification from 2005-2008

ACTIVITIES AND INTERESTS

- Enjoys chess, classical music, and reading historical fiction
- Ardent fan of J.R.R Tolkien, *Star Wars*, and Manchester United Football Club