

Joseph E. McMahan

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EDUCATION

University of California, Santa Barbara, Santa Barbara, CA June 2019
Ph.D.
Department of Electrical and Computer Engineering
Emphasis: **Computer Architecture**
Thesis Title: “The Zarf Architecture for Recursive Functions”

Princeton University, Princeton, NJ June 2013
Bachelor of Arts
Major: **Physics**
Certificate: **Applications of Computing**

PUBLICATIONS

LastLayer: Towards Hardware and Software Continuous Integration
Luis Vega, Jared Roesch, **Joseph McMahan**, Luis Ceze. *IEEE Micro* (Special Issue on Agile and Open-Source Hardware). May 2020.

Trace Wringing for Program Trace Privacy
Deeksha Dangawl, Weilong Cui, **Joseph McMahan**, and Timothy Sherwood. *IEEE Micro: Micro’s Top Picks from Computer Architecture Conferences* (IEEE Micro - top pick), May-June 2020.

Bouncer: Static Program Analysis in Hardware
Joseph McMahan, Michael Christensen, Kyle Dewey, Ben Hardekopf, and Timothy Sherwood. *International Symposium on Computer Architecture* (ISCA), June 2019. Phoenix, AZ.

Safer Program Behavior Sharing Through Trace Wringing
Deeksha Dangawl, Weilong Cui, **Joseph McMahan**, and Timothy Sherwood. *Proceedings of the 24th International Conference on Architectural Support for Programming Languages and Operating Systems* (ASPLOS), April 2019. Providence, RI.

Information Leakage in Arbiter Protocols
Nestan Tsiskaridze, Lucas Bang, **Joseph McMahan**, Tefvik Bultan, and Timothy Sherwood. *International Symposium for Verification and Analysis* (ATVA), October 2018. Los Angeles, CA.

Hiding Intermitten Information Leakage with Architectural Support for Blinking
Alric Althoff, **Joseph McMahan**, Luis Vega, Scott Davidson, Timothy Sherwood, Michael Taylor, and Ryan Kastner. *International Symposium on Computer Architecture* (ISCA), June 2018. Los Angeles, CA.

Charm: A Language for Closed-form High-level Architecture Modeling
Weilong Cui, Yongshan Ding, Deeksha Dangawl, Adam Holmes, **Joseph McMahan**, Ali Javadi-Abhari, Geroge Tzimpragos, Frederic Chong, Timothy Sherwood. *International Symposium on Computer Architecture* (ISCA), June 2018. Los Angeles, CA.

An Architecture for Analysis
Joseph McMahan, Michael Christensen, Lawton Nichols, Jared Roesch, Sung-Yee Guo, Ben Hardekopf, and Timothy Sherwood. *IEEE Micro: Micro’s Top Picks from Computer Architecture Conferences* (IEEE Micro - top pick), May-June 2018.

A Pythonic Approach for Rapid Hardware Prototyping and Instrumentation

John Clow, Georgios Tzimpragos, Deeksha Dangwal, Sammy Guo, **Joseph McMahan**, and Timothy Sherwood. *Proceedings of the International Conference on Field-Programmable Logic and Applications (FPL)*, September 2017. Ghent, Belgium.

Challenging On-Chip SRAM Security with Boot-State Statistics

Joseph McMahan, Weilong Cui, Liang Xia, Jeff Heckey, Frederic T. Chong, and Timothy Sherwood. *IEEE International Symposium on Hardware Oriented Security and Trust (HOST)*, May 2017. McLean, VA.

An Architecture Supporting Formal and Compositional Binary Analysis

Joseph McMahan, Michael Christensen, Lawton Nichols, Jared Roesch, Sung-Yee Guo, Ben Hardekopf, and Timothy Sherwood. *Proceedings of the 22th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, April 2017. Xi'an, China.

HONORS

ACM SIGARCH/IEEE CS TCCA Outstanding Dissertation Award 2020

Honorable Mention

“The ZARF Architecture for Recursive Functions”

IEEE Micro Top Pick 2020

“Trace Wringing for Program Trace Privacy”

IEEE Micro Top Pick 2018

“An Architecture for Analysis”

Distinguished Graduate Student Presentation Award 2017

1st Annual UCSB Summit.cs

Talk Title: “Software Like a Bridge”

National Science Foundation 2015

Graduate Research Fellowship Honorable Mention

Teaching 2014-2015

- Nominated: Academic Senate Outstanding Teaching Assistant Award
- Nominated: Graduate Student Association Excellence in Teaching Award

WORK EXPERIENCE

Postdoctoral Research Scientist University of Washington August 2019 - Present

- DARPA Real-Time Machine Learning Project

Co-op Research Intern AMD Research, Bellevue, Washington June 2015 - January 2016

- Creating analytic modeling framework for exascale computing

Teaching Assistant ECE Department, UC Santa Barbara September 2013 – May 2015

- CS 160: Translation of Programming Languages (Winter 2015)
- ECE 154A: Introduction to Computer Architecture (Fall 2013)
- ECE 152A: Digital Design Principles (Winter 2014, Spring 2014)

GRE Instructor Kaplan Test Prep, Santa Barbara, CA October 2013 – November 2014

- Teaching a formal class preparing students for the GRE (Graduate Record Examination).

Student Technician Office of Information Technology, Princeton University Fall 2011 – June 2013

- Walk-in technical help for student and faculty computer problems at the OIT Solutions Center.
- Experience troubleshooting and solving advanced problems with operating systems, applications, and hardware.

Residential Computing Consultant Office of Inf. Tech., Princeton University Fall 2010 – June 2013

- Offering on-call technical support for students in campus dormitories.
- Solving problems relating to network access, printing, and handheld devices.

Level 4 Associate In-N-Out Burger, Petaluma, CA June 2008 – August 2009

- Serving quality fast food in a clean environment with superior customer service.

MEMBERSHIPS

IEEE - Institute of Electrical and Electronics Engineers 2017 – Present
TCCA (Technical Committee on Computer Architecture)

ACM - Association for Computing Machinery 2015 – Present
SIGARCH (Special Interest Group on Computer Architecture)

REVIEWS

ASPLOS Architectural Support for Programming Languages and Operating Systems 2020-21

ASPLOS Artifact Evaluation 2020

ACM TECS Transactions on Embedded Computing Systems 2019

ACM TACO Transaction on Architecture and Code Optimization 2015