

Brian C. Schwedock

PH.D CANDIDATE

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Research Interests

My research interests lie in the intersection of hardware and software systems with a focus on caching. My projects involve optimizing caches to reduce data movement—a major source of latency, energy, and security vulnerabilities.

Research areas: computer architecture; computer systems; caching; near-data processing.

Education

Carnegie Mellon University

PH.D IN ELECTRICAL AND COMPUTER ENGINEERING

Advisor: NATHAN BECKMANN

Pittsburgh, PA

2017 - Present

Carnegie Mellon University

M.S. IN ELECTRICAL AND COMPUTER ENGINEERING

Pittsburgh, PA

2017 - 2019

University of Southern California

B.S. IN COMPUTER ENGINEERING AND COMPUTER SCIENCE (SUMMA CUM LAUDE)

MINOR IN MATHEMATICS

Los Angeles, CA

2013 - 2017

Awards

NSF Graduate Research Fellowship

2019 - 2022

CMU ECE Ann and Martin McGuinn Graduate Fellowship (x2)

2019 - 2021

CMU CIT Bertucci Fellowship

2017 - 2020

CMU CIT Dean's Fellowship

2017 - 2018

USC Computer Engineering and Computer Science Outstanding Student Award

2017

USC Boeing Scholarship (x2)

2015 - 2017

USC Rose Hills Foundation Scholarship (x2)

2015 - 2017

JFS-David Rubenstein Memorial Scholarship (x4)

2013 - 2017

USC Moore Scholarship

2014 - 2015

Professional Experience

Carnegie Mellon University

GRADUATE RESEARCH ASSISTANT

- Researching in computer architecture and computer systems.

Pittsburgh, PA

Aug 2017 - Present

Google

STUDENT RESEARCHER

- Extended internship researching in-memory caching with the Cloud Storage team.

Pittsburgh, PA

Sep 2019 - Jan 2020

Google

SOFTWARE ENGINEERING RESEARCH INTERN

- Member of the Cloud Storage team.
- Built a cache simulation infrastructure for an in-memory read-only cache: production cache tracing, simulator, and graph scripts.
- Validated simulation accurately duplicates results from production.
- Implemented multiple online and offline replacement policies to optimize miss ratio.
- Developed multiple online admission policies to optimize I/O cost.
- Investigated potential benefits of integrating a victim cache in SSD.

New York, NY

May - Aug, 2018 & 2019

General Atomics Aeronautical Systems Inc.

SOFTWARE ENGINEERING INTERN

- Member of the Software Flight Controls group.
- Developed post-processing test scripts for UAV flight controls testing.
- Contributed to the testing framework for UAV flight controls testing.

San Diego, CA

June - Aug 2017

USC Teamcore Research Group

UNDERGRADUATE RESEARCH ASSISTANT

- Developed and implemented a linear program for PAWS, a program deployed in Malaysia which solves a Stackelberg Security Game to combat poaching.
- Performed statistical analysis on crime data in Los Angeles.

Los Angeles, CA

Sep 2015 - May 2017

Sami Shamoon College of Engineering

SOFTWARE ENGINEERING RESEARCH INTERN

- Developed image processing enhancements in support of a Civil Engineering research project.
- Researched improvements for methodologies of unit testing.

Be'er Sheva, Israel

June - Aug 2016

ViaSat

SOFTWARE ENGINEERING INTERN

- Designed and built a testing infrastructure easily deployable in the cloud to test any software system through inconvenient testing.

Carlsbad, CA

May - Aug 2015

Publications

Jumanji: The Case for Dynamic NUCA in the Datacenter

Brian C. Schwedock, Nathan Beckmann

MICRO 2020

Acceptance rate: 19%

PAWS - A Deployed Game-Theoretic Application to Combat Poaching

Fei Fang, Thanh H. Nguyen, Rob Pickles, Wai Y. Lam, Gopalasamy R. Clements, Bo An, Amandeep Singh,
Brian C. Schwedock, Milind Tambe, Andrew Lemieux

AI Magazine 2017

Talks

Jumanji: The Case for Dynamic NUCA in the Datacenter

MICRO, Virtual, 20 Oct 2020

Teaching

18-746 Storage Systems

TEACHING ASSISTANT

CMU

Fall, 2020 & 2021

ITP-435 Professional C++

TEACHING ASSISTANT

USC

Spring 2017

EE-355 Software Design for Electrical Engineers

TEACHING ASSISTANT

USC

Spring, 2015 & 2016

Mentoring

Bas Yoovidhya (B.S.)

Winter 2020 - Present

Jennifer Seibert (B.S.)

Summer 2021

Hanchen Yang (M.S.)

Fall 2019 - Spring 2020

Amolak Nagi (B.S.)

Fall 2017 - Spring 2018