

Brian C. Schwedock

SoC ARCHITECT

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Education

Carnegie Mellon University

PH.D IN ELECTRICAL AND COMPUTER ENGINEERING

Thesis: OPTIMIZING DATA MOVEMENT THROUGH SOFTWARE CONTROL OF GENERAL-PURPOSE HARDWARE CACHES

Advisor: NATHAN BECKMANN

Pittsburgh, PA

2017 - 2023

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

Best Paper nominee at ISCA

2022

NSF Graduate Research Fellowship

2019 - 2022

CMU ECE Ann and Martin McGuinn Graduate Fellowship (x2)

2019 - 2021

CMU CIT Bertucci Fellowship

2017 - 2020

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

Samsung

SoC ARCHITECT

- Research and development for the architecture of Exynos mobile SoCs.

San Jose, CA

Sep 2023 - Present

Carnegie Mellon University

GRADUATE RESEARCH ASSISTANT

- Researching in computer architecture and computer systems.

Pittsburgh, PA

Aug 2017 - July 2023

Google

STUDENT RESEARCHER

- Cloud Storage team. Extended internship optimizing in-memory caches.

Pittsburgh, PA

Sep 2019 - Jan 2020

Google

SOFTWARE ENGINEERING RESEARCH INTERN

- Cloud Storage team. Built simulator for in-memory database cache. Optimized cache performance.

New York, NY

May - Aug, 2018 & 2019

General Atomics Aeronautical Systems Inc.

SOFTWARE ENGINEERING INTERN

- Software Flight Controls group. Developed test scripts for UAV flight controls testing.

San Diego, CA

June - Aug 2017

USC Teamcore Research Group

UNDERGRADUATE RESEARCH ASSISTANT

- Developed a linear program for PAWS, an app 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

- Built a testing infrastructure deployable in the cloud to test software systems through inconvenient testing.

Carlsbad, CA

May - Aug 2015

Refereed Conference Publications

The Tyr Dataflow Architecture: Improving Locality by Taming Parallelism

Nikhil Agarwal, Mitchell Fream, Souradip Ghosh, *Brian C. Schwedock*, Nathan Beckmann

MICRO 2024

Acceptance rate: 23%

Leviathan: A Unified System for General-Purpose Near-Data Computing

Brian C. Schwedock, Nathan Beckmann

MICRO 2024

Acceptance rate: 23%

täkō: A Polymorphic Cache Hierarchy for General-Purpose Optimization of Data Movement

Brian C. Schwedock, Piratach Yoovidhya, Jennifer Seibert, Nathan Beckmann

ISCA 2022 (Best Paper nominee)

Acceptance rate: 17%

Jumanji: The Case for Dynamic NUCA in the Datacenter

Brian C. Schwedock, Nathan Beckmann

MICRO 2020

Acceptance rate: 19%

Refereed Journal Publications

UDIR: Towards a Unified Compiler Framework for Reconfigurable Dataflow Architectures

Nikhil Agarwal, Mitchell Fream, Souradip Ghosh, *Brian C. Schwedock*, Nathan Beckmann

IEEE CAL 2024

Kobold: Simplified Cache Coherence for Cache-Attached Accelerators

Jennifer Brana, *Brian C. Schwedock*, Yatin A. Manerkar, Nathan Beckmann

IEEE CAL 2023

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

Refereed Workshop Publications

UDIR: Towards a Unified Compiler Framework for Reconfigurable Dataflow Architectures

Nikhil Agarwal, Mitchell Fream, Souradip Ghosh, *Brian C. Schwedock*, Nathan Beckmann

WDDSA @ MICRO 2023

Kobold: Simplified Cache Coherence for Cache-Attached Accelerators

Jennifer Brana, *Brian C. Schwedock*, Yatin A. Manerkar, Nathan Beckmann

WDDSA @ MICRO 2022

Talks

Optimizing Data Movement through Software Control of General-Purpose CPU Caches

Qualcomm, 3 Jan 2023

täkō: A Polymorphic Cache Hierarchy for General-Purpose Optimization of Data Movement

PDL Retreat, Pittsburgh,

8 Nov 2022

täkō: A Polymorphic Cache Hierarchy for General-Purpose Optimization of Data Movement

ISCA, 20 June 2022

Jumanji: The Case for Dynamic NUCA in the Datacenter

MICRO, 20 Oct 2020

Teaching

18-746 Storage Systems

TEACHING ASSISTANT

CMU

Fall 2021

18-746 Storage Systems

TEACHING ASSISTANT

CMU

Fall 2020

ITP-435 Professional C++

TEACHING ASSISTANT

USC

Spring 2017

EE-355 Software Design for Electrical Engineers

TEACHING ASSISTANT

USC

Spring 2016

EE-355 Software Design for Electrical Engineers

TEACHING ASSISTANT

USC

Spring 2015

Mentoring

Jennifer Brana (B.S.)

Summer 2022 - Summer 2023

Piratach Yoovidhya (B.S.)

Fall 2020 - Spring 2022

Jennifer Seibert (B.S.)

Summer 2021

Hanchen Yang (M.S.)

Fall 2019 - Spring 2020

Amolak Nagi (B.S.)

Fall 2017 - Spring 2018