Brian C. Schwedock

SoC Architect

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Education

Carnegie Mellon University   *Pittsburgh, PA*

Ph.D in Electrical and Computer Engineering   *2017 - 2023*

Thesis: Optimizing Data Movement Through Software Control of General-Purpose Hardware Caches

Advisor: Nathan Beckmann

Carnegie Mellon University   *Pittsburgh, PA*

M.S. in Electrical and Computer Engineering   *2017 - 2019*

University of Southern California   *Los Angeles, CA*

B.S. in Computer Engineering and Computer Science (summa cum laude)   *2013 - 2017*

Minor in Mathematics

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   *San Jose, CA*

SoC Architect   *Sep 2023 - Present*

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

Carnegie Mellon University   *Pittsburgh, PA*

Graduate Research Assistant   *Aug 2017 - July 2023*

- Researching in computer architecture and computer systems.

Google   *Pittsburgh, PA*

Student Researcher   *Sep 2019 - Jan 2020*

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

Google   *New York, NY*

Software Engineering Research Intern   *May - Aug, 2018 & 2019*

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

General Atomics Aeronautical Systems Inc.   *San Diego, CA*

Software Engineering Intern   *June - Aug 2017*

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

USC Teamcore Research Group   *Los Angeles, CA*

Undergraduate Research Assistant   *Sep 2015 - May 2017*

- 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.

Sami Shamoon College of Engineering   *Be'er Sheva, Israel*

Software Engineering Research Intern   *June - Aug 2016*

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

ViaSat *Carlsbad, CA*
Software Engineering Intern *May - Aug 2015*
- Built a testing infrastructure deployable in the cloud to test software systems through inconvenient testing.

Refereed Conference Publications

The Tyr Dataflow Architecture: Improving Locality by Taming Parallelism *MICRO 2024*
Nikhil Agarwal, Mitchell Fream, Souradip Ghosh, *Brian C. Schwedock*, Nathan Beckmann *Acceptance rate: 23%*

Leviathan: A Unified System for General-Purpose Near-Data Computing *MICRO 2024*
Brian C. Schwedock, Nathan Beckmann *Acceptance rate: 23%*

täkō: A Polymorphic Cache Hierarchy for General-Purpose Optimization of Data Movement *ISCA 2022 (Best Paper nominee)*
Brian C. Schwedock, Piratach Yoovidhya, Jennifer Seibert, Nathan Beckmann *Acceptance rate: 17%*

Jumanji: The Case for Dynamic NUCA in the Datacenter *MICRO 2020*
Brian C. Schwedock, Nathan Beckmann *Acceptance rate: 19%*

Refereed Journal Publications

UDIR: Towards a Unified Compiler Framework for Reconfigurable Dataflow Architectures *IEEE CAL 2024*
Nikhil Agarwal, Mitchell Fream, Souradip Ghosh, *Brian C. Schwedock*, Nathan Beckmann

Kobold: Simplified Cache Coherence for Cache-Attached Accelerators *IEEE CAL 2023*
Jennifer Brana, *Brian C. Schwedock*, Yatin A. Manerkar, Nathan Beckmann

PAWS – A Deployed Game-Theoretic Application to Combat Poaching *AI Magazine 2017*
Fei Fang, Thanh H. Nguyen, Rob Pickles, Wai Y. Lam, Gopalasamy R. Clements, Bo An, Amandeep Singh, *Brian C. Schwedock*, Milind Tambe, Andrew Lemieux

Refereed Workshop Publications

UDIR: Towards a Unified Compiler Framework for Reconfigurable Dataflow Architectures *WDDSA @ MICRO 2023*
Nikhil Agarwal, Mitchell Fream, Souradip Ghosh, *Brian C. Schwedock*, Nathan Beckmann

Kobold: Simplified Cache Coherence for Cache-Attached Accelerators *WDDSA @ MICRO 2022*
Jennifer Brana, *Brian C. Schwedock*, Yatin A. Manerkar, Nathan Beckmann

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 *CMU*
Teaching Assistant *Fall 2021*
18-746 Storage Systems *CMU*
Teaching Assistant *Fall 2020*
ITP-435 Professional C++ *USC*
Teaching Assistant *Spring 2017*

EE-355 Software Design for Electrical Engineers   *USC*

Spring 2016

EE-355 Software Design for Electrical Engineers   *USC*

TEACHING ASSISTANT   *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*