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 2019*
- Cloud Storage team. In-memory database-cache optimization for I/O. Replacement policy exploration.

Google — *New York, NY*
Software Engineering Research Intern — *May - Aug 2018*
- 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

Leviathan: A Unified System for General-Purpose Near-Data Computing — *MICRO, 5 Nov 2024*

Architectures and Programming Models for General-Purpose Near-Data Computing — *PIM @ MICRO, 2 Nov 2024*

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, CMU, 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*
Teaching Assistant *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*