

Sam (Likun) Xi

GENERAL	Software Engineer at Google Inc. 1600 Amphitheatre Parkway Mountain View, CA 94043	<i>Website:</i> www.samxi.org <i>E-mail:</i> xyzsam@google.com
RESEARCH INTERESTS	Computer architecture , datacenter workloads, performance optimization, machine learning, hardware accelerators, SoC design, power/performance modeling.	
EDUCATION	Harvard University, Cambridge, MA 02138 S.M., Ph.D., <i>Computer Science</i> , August 2013 - November 2018 Advised by David Brooks and Gu-Yeon Wei Duke University, Durham, NC 27708 B.S.E, <i>Electrical and Computer Engineering</i> , 2009-2013 B.S., <i>Physics</i> , 2009-2013 · <i>Summa Cum Laude</i> , with Departmental Distinction. Final GPA: 3.937	
CONFERENCE PUBLICATIONS	Bruceek Khailany, Evgeni Krimer, Rangharajan Venkatesan, Jason Clemons, Joel S. Emer, Matthew Fojtik, Alicia Klinefelter, Michael Pellauer, Nathaniel Pinckney, Yakun Sophia Shao, Shree-sha Srinath, Christopher Torng, Sam (Likun) Xi, Yanqing Zhang, and Brian Zimmer. “A Modular Digital VLSI Flow for High-Productivity SoC Design”, <i>Design Automation Conference</i> , June 2018. Svilen Kanev, Sam (Likun) Xi, Gu-Yeon Wei, and David Brooks. “Mallacc: Accelerating Memory Allocation”, <i>Proc. International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)</i> , April 2017. Best Paper Candidate. Yakun Sophia Shao, Sam (Likun) Xi, Viji Srinivasan, Gu-Yeon Wei, and David Brooks. “Co-Designing Accelerators and SoC Interfaces Using gem5-Aladdin”, <i>Proc. International Symposium on Microarchitecture (MICRO)</i> , October 2016. Sam (Likun) Xi, Oreoluwa Babarinsa, Manos Athanassoulis, and Stratos Idreos. “Beyond the Wall: Near-Data Processing for Databases”, <i>SIGMOD Workshop on Data Management on New Hardware (DaMoN)</i> , June 2015. Sam (Likun) Xi, Hans Jacobson, Pradip Bose, Gu-Yeon Wei, and David Brooks. “Quantifying Sources of Error in McPAT and Potential Impacts on Architectural Studies”, <i>Proc. International Symposium on High Performance Computer Architecture (HPCA)</i> , February 2015. Yakun Sophia Shao, Sam Xi, Viji Srinivasan, Gu-Yeon Wei, and David Brooks. “Towards Cache-Friendly Hardware Accelerators”, <i>In Sensors and Cloud Architectures Workshop, High Performance Computer Architecture (HPCA)</i> , February 2015. Sam Xi, Marisabel Guevara, Jared Nelson, Patrick Pensabene, and Benjamin C. Lee. “Understanding the Critical Path in Power State Transition Latencies”, <i>Proc. International Symposium on Low Power Electronics and Design (ISLPED)</i> , September 2013.	
THESES	Likun (Sam) Xi. <i>Advancing System-Level Analysis and Design of Specialized Architectures.</i> Ph.D Dissertation. Harvard University, School of Engineering and Applied Sciences, 2018.	

PROFESSIONAL
EXPERIENCE

NVIDIA Corporation, Architecture Research Group

Research Intern

May 2017 to August 2017

- Supervisor: Joel Emer, Steve Keckler
- Evaluated the tradeoffs of building flexible machine learning hardware accelerators.
- Implemented sparse convolution on a prototype DNN accelerator in synthesizable SystemC to evaluate its performance on a new workload.
- Implemented various dense convolutional dataflows on this prototype to compare its performance against fixed-function accelerators.

NVIDIA Corporation, ASIC/VLSI Research Group

Research Intern

May 2015 to August 2015

- Supervisor: Bruce Khailany
- Investigated using high-level synthesis tools to supplant hand-written RTL for hardware prototyping and design in a commercial setting.
- Implemented various parameterizable floating-point units in C++ using HLS tools.
- Implemented the texture filtering stage from Pascal GPU using HLS and obtained comparable quality-of-result compared to hand-written RTL.
- Implemented synthesizable cache simulator in SystemC for use in rapid prototyping of new hardware designs.

AWARDS

Harvard University

- Gordon McKay Graduate Research Fellowship, 2013.
- James Mills Peirce Fellowship, 2013

National Science Foundation

- Graduate Research Fellowship, 2013 - 2016.

Duke University

- Charles Ernest Seager Memorial Award, 2013
- ECE Department, Best Poster Award, 2013.
- Top 5% of 2013 Engineering Class.
- Dean's List with Distinction 2009-2013.

Honors Societies

- Phi Beta Kappa Honors Society.
- Sigma Pi Sigma Physics Society.
- Tau Beta Pi Engineering Society.

SKILLS

Programming

- Languages: C++, C, Python, Java, SystemC
- OS: Experience with the Linux kernel on both x86 and ARM
- CAD tools: Catapult HLS, Vivado Design Suite

I am the primary maintainer of:

- gem5-Aladdin, an SoC simulator
<https://github.com/harvard-acc/gem5-aladdin>
- Aladdin, an accelerator power/performance/area simulator
<https://github.com/ysshao/Aladdin>
- LLVM-Tracer, an LLVM optimization pass used by Aladdin
<https://github.com/ysshao/LLVM-Tracer>

REFERENCES

Dr. David Brooks (dbrooks@eecs.harvard.edu; (617) 495-3989)

- Haley Family Professor of Computer Science
- School of Engineering and Applied Sciences, Harvard University.

Dr. Gu-Yeon Wei (guyeon@eecs.harvard.edu; (617) 495-3989)

- Gordon McKay Professor of Electrical Engineering
- School of Engineering and Applied Sciences, Harvard University.

Dr. Michael Pellauer (mpellauer@nvidia.com)

- Senior Research Scientist.
- Architecture Research Group, NVIDIA.