SAMANTHA MILLER

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EDUCATION

University of Washington *September 2018 - Present*
Ph.D. Computer Science Overall GPA: 3.97/4.0
Master's of Computer Science *June 2020*
Advisor: Tom Anderson

University of Texas *August 2014 - May 2018*
Bachelor of Computer Science. Overall GPA: 3.98/4.0

RESEARCH INTERESTS

Operating Systems, Distributed Systems, Cloud Computing, Datacenter Systems

RESEARCH PROJECTS

High Velocity Linux Kernel Development with Bento

In this project, we seek to extend the ongoing push for high development velocity in production systems into the Linux kernel. In our published work, Bento enables developers to write file systems in safe Rust, improving safety without significant performance impact or development overhead, and allows file systems to be redeployed without disruption and debugged in userspace without changing code. We're currently working on extending this work to networking stacks and plan to extend it to other modules as future work.

Impact of Userspace Networking on MapReduce

In this work for my undergraduate thesis, I examined the performance impact of using userspace networking for MapReduce. As faster networking hardware has rapidly become available and Moore's law has slowed down, network processing in certain network-intensive jobs has become limited by the CPU. Userspace, kernel-bypass networking has the potential to improve performance in these cases by reducing network processing. This project found that userspace networking has the potential to significantly improve performance for MapReduce, but existing tools weren't mature enough for practical use.

PUBLICATIONS

Conference Papers

Samantha Miller, Kaiyuan Zhang, Mengqi Chen, Ryan Jennings, Ang Chen, Danyang Zhuo, Tom E. Anderson. *High Velocity Kernel File Systems with Bento.* The 19th USENIX Conference on File and Storage Technologies (FAST), 2021. `www.usenix.org/conference/fast21/presentation/miller`
Best Paper Award

Workshop Papers

Jialin Li, **Samantha Miller**, Danyang Zhuo, Ang Chen, Jon Howell, Thomas E. Anderson. *An Incremental Path Towards a Safe OS Kernel.* The 18th Workshop on Hot Topics in Operating Systems (HotOS), 2021. `https://sigops.org/s/conferences/hotos/2021/papers/hotos21-s09-li.pdf`

Samantha Miller, Kaiyuan Zhang, Danyang Zhuo, Shibin Xu, Arvind Krishnamurthy, Thomas E. Anderson. *Practical Safe Linux Kernel Extensibility.* The 17th Workshop on Hot Topics in Operating Systems (HotOS), 2019. `https://dl.acm.org/doi/10.1145/3317550.3321429`

Invited Articles

Samantha Miller, Kaiyuan Zhang, Mengqi Chen, Ryan Jennings, Ang Chen, Danyang Zhuo, Tom E. Anderson. *High Velocity Kernel File Systems with Bento.* USENIX ;login;, 2021. `https://www.usenix.org/publications/loginonline/high-velocity-kernel-file-systems-bento`

POSTERS

Samantha Miller, Kaiyuan Zhang, Danyang Zhuo, Thomas E. Anderson. *High Performance Safe Extensibility for Linux Kernel File Systems.* The 18th USENIX Conference on File and Storage Technologies (FAST), 2020.

TECHNICAL STRENGTHS

Programming (> 1000 lines)	Rust, C, C++, Python
Programming (Familiar)	JavaScript, Java, x86 Assembly

WORK EXPERIENCE

Google May-August 2018
Ph.D. Software Engineering Intern

· Improved code quality Chrome OS command line tool by converting to Rust.
· Increased security of the command line tool using a jail.
· Attended panels and talks at Google PhD Intern Research Conference.

Google May-August 2017
Software Engineering Intern

· Worked on virtualization for Google Compute Engine
· Implemented memory saving in KVM in Google's production kernel
· Attended We are GWE conference for Google Women Engineers

Google May-August 2016
Engineering Practicum Intern

· Worked on FlumeJava and Google Cloud Dataflow.
· Added features to visualization of large scale distributed systems for Google Cloud Dataflow.
· Participated in a distributed systems reading group.

Google May-August 2015
Engineering Practicum Intern

· Implemented traffic shaping for internal tools.
· Created analytical scripts for testing output.
· Attended We are GWE conference for Google Women Engineers

HONORS AND AWARDS

Best Paper Award - FAST 2021	February 2021
David Notkin Fellowship	September 2018
Dean's Scholars Student Council Member	August 2015 - May 2017
Turing Scholars Honor Program	August 2014 - May 2018
Dean's Scholars Honor Program	August 2014 - May 2018
Distinguished Presidential Achievement Scholarship	August 2014 - May 2018