Jianshen **Liu**

SOFTWARE ENGINEER · COMPUTATIONAL STORAGE, SMARTNIC, AND DISTRIBUTED SYSTEM EXPERT

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Skills

DevOps	AWS, Jupyter Notebook, Docker, Vagrant, Jenkins, Git, Mercurial, Maven, Gradle, VSCode, IntelliJ IDEA, CI/CD
Back-end	Linux Kernel, eBPF, DPDK, Ceph, Hadoop, MySQL, RocksDB, Ansible, FlameGraph, Apache Arrow, NVMe, Distributed Systems
Programming	C++, Python, Java, Bash, SQL, PHP, C#, Javascript, LaTeX, Vimscript
Languages	English, Cantonese, Mandarin
Others	Patience, Open-Mindedness, Active Listening, Easily Adaptable, Agile Methodologies

Work Experience

University of California, Santa Cruz
Santa Cruz, USA
GRADUATE STUDENT RESEARCHER — *Jan 2016 - Present*

- Conducting research on offloading distributed data management to computational storage devices
- Working with Sandia National Laboratories to improve network data flow management in HPC with SmartNICs
- Implemented the Bitar library to speed up compression with hardware accelerator by 8x
- Developed the no_fscache kernel model to solve page cache pollution before RWF_UNCACHED was introduced into the POSIX API

KIOXIA America, Inc.
San Jose, USA
STRATEGIC MARKETING ENGINEER INTERN — *Jun 2020 - Sep 2020*

- Quantified the performance benefit (>10x speedup) of offloading SQL query processing to SSDs using the TPC-H benchmark
- Reported monthly to the senior vice president
- Invited discussions on cross-team projects to identify performance issues
- Delivered a white paper to summarize the findings used by internal strategic planning

Samsung Semiconductor
San Jose, USA
PERFORMANCE ANALYSIS ENGINEER INTERN — *Jul 2019 - Sep 2019*

- Constructed a test framework to automate the performance evaluation for Samsung Network KV devices
- Created eBPF- and kprobe-based tools to enhance the performance observability of the device API
- Identified major system bottlenecks with the tools developed, resolving issues boosted the write performance by 60%

Wumii Technology
Shenzhen, China
ANDROID DEVELOPMENT TEAM LEAD — *Dec 2012 - Jun 2014*

- Led and engineered the first reading recommendation app (among the top 25 social apps) in China
- Implemented an energy-efficient and highly available Paho MQTT-based notification module that outperformed commercial solutions in terms of latency by 35%

SENIOR SOFTWARE ENGINEER — *Jun 2010 - Dec 2012*

- Worked as a core engineer to develop the first news recommendation system in China
- Drove the system design to handle distributed requests and key components for code obfuscation
- Established a framework for displaying article recommendations across different platforms, achieved 200 million monthly active users

Education

University of California, Santa Cruz
Santa Cruz, USA
DOCTOR OF PHILOSOPHY (PH.D.), COMPUTER SCIENCE AND ENGINEERING — *2016 - Present*
Grade: 3.95 / 4.00

South China Agricultural University
Guangzhou, China
BACHELOR OF SCIENCE (BS), INFORMATION AND COMPUTING SCIENCE — *2006 - 2010*
Grade: 3.45 / 4.00

Honors & Awards

Sep 2022	**Outstanding Student Paper**, IEEE High Performance Extreme Computing (HPEC) (top 5%)	*Virtual Conference*
Oct 2009	**National Encouragement Scholarship**, South China Agricultural University	*Guangzhou, China*
Oct 2009	**The Second Prize Scholarship**, South China Agricultural University (top 10%)	*Guangzhou, China*
Oct 2008	**State Grants**, South China Agricultural University	*Guangzhou, China*
Oct 2008	**The Second Prize Scholarship**, South China Agricultural University (top 10%)	*Guangzhou, China*

Publications

Processing Particle Data Flows with SmartNICs
Liu Jianshen, Maltzahn Carlos, Curry Matthew L. Ulmer Craig
26th Annual 2022 IEEE High Performance Extreme Computing (IEEE-HPEC 2022), 2022, Virtual Conference

Performance Characteristics of the BlueField-2 SmartNIC
Jianshen Liu, Carlos Maltzahn, Craig Ulmer, Matthew Leon Curry
arXiv preprint arXiv:2105.06619 (2021). 2021

Implementing a Kernel Module to Eliminating External Caching Effects
Jianshen Liu
The Center for Research in Open Source Software (CROSS), 2020

Scale-out Edge Storage Systems with Embedded Storage Nodes to Get Better Availability and {Cost-Efficiency} At the Same Time
Jianshen Liu, Matthew Leon Curry, Carlos Maltzahn, Philip Kufeldt
3rd USENIX Workshop on Hot Topics in Edge Computing (HotEdge'20), 2020

MBWU: Benefit Quantification for Data Access Function Offloading
Jianshen Liu, Philip Kufeldt, Carlos Maltzahn
International Conference on High Performance Computing (HPC-IODC 2019), 2019, Springer, Cham

Presentations & Posters

Experience of using the BlueField-2 DPU
Presented at Sandia National Laboratories, 2022

Processing Particle Data Flows with SmartNICs
Presented at UC Santa Cruz Open Source Symposium, 2022

Eusocial Storage Devices
Presented at KIOXIA America Inc., Seagate Technology, and Fujitsu America Inc. 2020

MBWU (MibeeWu): Quantifying benefits of offloading data management to storage devices
Poster Session at 17th USENIX Conference on File and Storage Technologies (FAST'19), 2019

Quantifying benefits of offloading data management to storage devices
Poster Session at 2019 OCP Global Summit Symposium, 2019

Certifications

Jan 2022	**Cruzhacks Mentor Certificate**, CruzHacks	*Santa Cruz, USA*
Dec 2020	**Graduate Student Professional Communication Certificate**, University of California, Santa Cruz	*Santa Cruz, USA*

Program Committees

CruzHacks — *Santa Cruz, USA*
TECH MENTOR — *Jan 2020, Jan 2021*
Mentored hackers to build web applications to solve real-world problems

Center for Research in Open Source Software (CROSS) — *Santa Cruz, USA*
WORKSHOP CHAIR — *Oct 2021, Oct 2020*
Chaired the SmartNICs and Eusocial Storage Devices workshop at the 5th and 6th CROSS Research Symposium at UC Santa Cruz