

# Yifei Liu

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## Education

### Stony Brook University

- Ph.D. in Computer Science (Advisor: Erez Zadok)
- M.S. in Computer Science (earned en route to Ph.D. program)
- GPA: 3.93 / 4.0

Stony Brook, NY

08/2019 – 08/2025

08/2019 – 12/2021

### Huazhong University of Science and Technology

- M.Eng. in Computer System Architecture (Advisor: Ke Zhou)

Wuhan, China

09/2016 – 06/2019

### Huazhong Agricultural University

- B.Eng. in Computer Science and Technology

Wuhan, China

09/2012 – 06/2016

## Experience

### Google LLC

*Software Engineer*

Kirkland, WA

08/2025 – Present

- Work on Google Compute Engine (GCE) and AI/ML infrastructure in Google Cloud

### File systems and Storage Lab (FSL), Stony Brook University

*Research Assistant (C/C++, File Systems, Formal Verification)*

Stony Brook, NY

05/2020 – 08/2025

- Developed a model-checking framework that found 15+ Linux file-system bugs
- Built RefFS, a user-space file system with state save/restore, 3–28× faster than others

### Samsung Semiconductor, Inc.

*Storage Systems Architect Intern (C++, Databases, Storage)*

San Jose, CA

05/2022 – 08/2022

- Offloaded aggregates to SmartSSD via custom PostgreSQL paths, boosting query performance

### Wuhan National Laboratory for Optoelectronics

*Research Assistant (Python, Deep Learning, Cloud Storage)*

Wuhan, China

09/2016 – 06/2019

- Built a storage system with DL hashing and a graph DB, cutting query latency by 82–94%

### Tencent Cloud

*Backend Developer Intern (C++, Machine Learning, Storage)*

Shenzhen, China

12/2015 – 08/2016

- Built infra for long-term disk data on 10K+ servers, predicting failures with 90%+ precision

## Selected Publications

**Summary:** 4 journal articles, 10 conference/workshop papers, 2 posters, and 2 granted patents

**Google Scholar (full list):** [scholar.google.com/citations?user=WNu87vQAAAAJ](https://scholar.google.com/citations?user=WNu87vQAAAAJ)

### Journal Articles

- [1] M. Antunes, T. Estro, P. Bhandari, A. Gandhi, G. Kuenning, Y. Liu, et al. “Kneeliverse: A universal knee-detection library for performance curves.” *SoftwareX*, 2025.
- [2] T. Estro, M. Antunes, P. Bhandari, A. Gandhi, G. Kuenning, Y. Liu, et al. “Accelerating Multi-Tier Storage Cache Simulations Using Knee Detection.” *Performance Evaluation*, 2024.
- [3] Y. Liu, Y. Wang, K. Zhou, Y. Yang, and Y. Liu. “Semantic-aware Data Quality Assessment for Image Big Data.” *Future Generation Computer Systems*, 2020.

### Conference and Workshop Papers

- [1] Y. Liu, et al. “Enhanced File System Testing through Input and Output Coverage.” In *the 18th ACM International Systems and Storage Conference (SYSTOR)*, 2025.
- [2] Y. Liu, et al. “Metis: File System Model Checking via Versatile Input and State Exploration.” In *the 22nd USENIX Conference on File and Storage Technologies (FAST)*, 2024.
- [3] T. Estro, M. Antunes, P. Bhandari, A. Gandhi, G. Kuenning, Y. Liu, et al. “Guiding Simulations of Multi-Tier Storage Caches Using Knee Detection.” In *the 31st International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS)*, 2023.

- [4] **Y. Liu**, et al. “Input and Output Coverage Needed in File System Testing.” In *the 15th ACM Workshop on Hot Topics in Storage and File Systems (HotStorage)*, 2023.
- [5] W. Su, **Y. Liu**, et al. “Model-Checking Support for File System Development.” In *the 13th ACM Workshop on Hot Topics in Storage and File Systems (HotStorage)*, 2021.
- [6] Y. Liu, H. Jiang, Y. Wang, K. Zhou, **Y. Liu**, et al. “Content Sifting Storage: Achieving Fast Read for Large-scale Image Dataset Analysis.” In *the 57th Design Automation Conference (DAC)*, 2020.
- [7] Y. Liu, Y. Wang, K. Zhou, Y. Yang, **Y. Liu**, et al. “A Framework for Image Dark Data Assessment.” In *the 3rd APWeb-WAIM joint conference on Web and Big Data (APWeb-WAIM)*, 2019. **(Best Paper Runner-Up)**

#### Patents

- [1] K. Zhou, Y. Liu, Y. Yang, H. Wang, C. Li, Y. Wang, **Y. Liu**. Method for valuation of image dark data based on similarity hashing. U.S. Patent US11,138,479B2, Granted: 10/05/2021.
- [2] K. Zhou, **Y. Liu**, Y. Liu, Y. Wang, Y. Yang. Image query method and system based on content semantic metadata. Chinese Patent CN110413807B, Granted: 04/20/2021.

## Skills





### Programming Languages

- **Fluent ( $\geq 10,000$  LoC):** C, C++, Python, Bash
- **Intermediate ( $\geq 2,000$  LoC):** SQL, Java, MATLAB, Cypher, JavaScript, Promela, Prolog

### Technologies

- **Databases:** MySQL, Neo4j, PostgreSQL, HBase, Db2
- **File and Storage:** Linux VFS and kernel file systems, NFS, OpenStack Swift, HDFS
- **Virtualization:** Docker, Kubernetes, QEMU, KVM, VMware ESXi
- **Tools:** CMake, GDB, Git, Hadoop, Spark, TensorFlow, Elasticsearch, bpftool, LTTng

## Projects

<b>Metis</b> 	a versatile framework for file system model checking (C/C++)	2020 – 2024
<b>RefFS</b> 	a fast and reliable file system for checking reference (C++)	2020 – 2024
<b>IOCov</b> 	input and output coverage for file system testing (Python)	2022 – 2025
<b>CM-IOCov</b> 	improving input coverage in file system crash testing (C/C++)	2024 – 2025

## Talks

- **Enhanced File System Testing through Input and Output Coverage**  
- ACM SYSTOR 2025
- **Metis: File System Model Checking via Versatile Input and State Exploration**  
- USENIX FAST 2024, Graduate Research Day 2024
- **Input and Output Coverage Needed in File System Testing**  
- ACM HotStorage 2023
- **Model-Checking Support for File System Development**  
- ACM HotStorage 2021, Dutch Model Checking Day 2022

## Service

### Journal Reviewer

- ACM Transactions on Architecture and Code Optimization (TACO)
- IEEE Access

### Artifact Evaluation Committee

- USENIX OSDI '23, USENIX ATC '23

## Teaching

Teaching Assistant for CSE376 Advanced Systems Programming in Unix/C	S '20, S '21
Teaching Assistant for CSE306 Operating Systems	F '19

## Contest Awards

- Finalist, Interdisciplinary Contest in Modeling (MCM/ICM), USA, 2015.
- First Prize, National Postgraduate Mathematic Contest in Modeling, China, 2014.
- First Prize, Contemporary Undergraduate Mathematical Contest in Modeling, China, 2014.