

# Jing Liu

Senior Researcher  
Systems Research Group  
Microsoft Research Asia

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## RESEARCH INTERESTS

I am a computer systems researcher specializing in operating systems, storage systems, and distributed systems. My work builds an *instance-customizable operating system* – an OS that adapts at runtime to hardware, workloads, and failure context without breaking compatibility. I aim to advance the foundation for cloud- and AI-era systems, where each application-hardware instance can achieve instance-optimal performance and reliability, enabled by a fundamentally customizable OS.

## EDUCATION

### Department of Computer Sciences, University of Wisconsin – Madison

Ph.D. in Computer Sciences Aug. 2024  
M.S. in Computer Sciences May 2022  
Advisors: Prof. Andrea Arpaci-Dusseau & Prof. Remzi Arpaci-Dusseau  
Thesis: *Scale, Performance, and Fault Tolerance in a Filesystem Semi-Microkernel*

### Software Institute, Nanjing University

B.E. in Software Engineering Rank: 1/238 May 2016  
Thesis: *Depth-aware layered edge for elastic RGB-D object proposal*

## PROFESSIONAL EXPERIENCE

### Microsoft Research Asia

Senior Researcher. Oct. 2024 – Present

### Google, Madison, WI

Software Engineering Intern. Mentor: Dr. Marc De Kruijf Summer 2019

### Microsoft Research, Redmond, WA

Research Intern. Mentor: Dr. Irene Zhang Summer 2018

## HONORS AND AWARDS

Erik Riedel Best Paper Award (FAST '25)	2025
Meta PhD Research Fellowship, Meta Inc.	2022 – 2024
Student Travel Grant (SOSP '17, OSDI '18, and OSDI '22)	2017, 2018, & 2022
CS Department Golden Brick Award, CS@UW-Madison	2022
CS Summer Research Award, UW-Madison	2017
Graduate Research Fellowship, UW-Madison	2016 – 2017
Departmental Best Undergraduate Thesis, University Highest Honor, Provincial Award	2016
Outstanding National Undergraduate Innovation Project (Role: Lead)	2016
National Encouraging Scholarship, Ministry of Education of China	2014, 2015
National Scholarship, Ministry of Education of China	2013

## REFEREED CONFERENCE PUBLICATIONS

<sup>†</sup> Student mentored by me.

- [1] Zhongjie Chen<sup>†</sup>, Wentao Zhang, Yulong Tang<sup>†</sup>, Ran Shu, Fengyuan Ren, Tianyin Xu, and **Jing Liu**. *Principled Performance Tunability in Operating System Kernels*. (arXiv Preprint, Submitted)
- [2] Yaoqi Chen, Jinkai Zhang, Baotong Lu, Qianxi Zhang, Chengruidong Zhang, **Jing Liu**, Jingjia Luo, Di Liu, Huiqiang Jiang, Qi Chen, Bailu Ding, Xiao Yan, Jiawei Jiang, Chen Chen, Mingxing Zhang, Yuqing Yang, Fan Yang, and Mao Yang. *RetroInfer: A Vector-Storage Approach for Scalable Long-Context LLM Inference*. (Under One-shot Revision for VLDB)
- [3] Chuandong Li, Ran Yi, Zonghao Zhang, **Jing Liu**, Changwoo Min, Jie Zhang, Yingwei Luo, Xiaolin Wang, Zhenlin Wang, Diyu Zhou. *Aeolia: A Fast and Secure Userspace Interrupt-Based Storage Stack*. In Proceedings of the 31st Symposium on Operating Systems Principles (SOSP '25), Seoul, South Korea, 2025.
- [4] Shawn Zhong<sup>†</sup>, **Jing Liu**, Andrea Arpaci-Dusseau, and Remzi Arpaci-Dusseau. *Revealing the Unstable Foundations of eBPF-Based Kernel Extensions*. In Proceedings of the 20th European Conference on Computer Systems (EuroSys '25), Rotterdam, Netherlands, 2025
- [5] **Jing Liu**, Yifan Dai, Andrea C. Arpaci-Dusseau, and Remzi H. Arpaci-Dusseau. *Fast, Transparent Filesystem Microkernel Recovery with Ananke*. In Proceedings of the 23rd USENIX Conference on File and Storage Technologies (FAST '25), Santa Clara, CA, 2025. (**Erik Riedel Best Paper Award**)
- [6] Yifan Dai, **Jing Liu**, Andrea C. Arpaci-Dusseau, and Remzi H. Arpaci-Dusseau. *Symbiosis: The Art of Application and Kernel Cache Cooperation*. In Proceedings of the 22nd USENIX Conference on File and Storage Technologies (FAST '24), Santa Clara, 2024.
- [7] **Jing Liu**, Anthony Rebello, Yifan Dai, Chenhao Ye, Sudarsun Kannan, Andrea C. Arpaci-Dusseau, and Remzi H. Arpaci-Dusseau. *Scale and Performance in a Filesystem Semi-Microkernel*. In Proceedings of the 28th ACM Symposium on Operating Systems Principles (SOSP '21), Virtual Event, Germany, 2021.
- [8] Irene Zhang, Amanda Raybuck, Pratyush Patel, Kirk Olynyk, Jacob Nelson, Omar S. Navarro Leija, Ashlie Martinez, **Jing Liu**, Anna Kornfeld Simpson, Sujay Jayakar, Pedro Henrique Penna, Max Demoulin, Piali Choudhury, and Anirudh Badam. *The Demikernel Library OS Architecture for Microsecond, Kernel-Bypass Datacenter Systems*. In Proceedings of the 28th ACM Symposium on Operating Systems Principles (SOSP '21), Virtual Event, Germany, 2021.
- [9] Suli Yang, **Jing Liu**, Andrea C. Arpaci-Dusseau, and Remzi H. Arpaci-Dusseau. *Principled Schedulability Analysis for Distributed Storage Systems using Thread Architecture Models*. In Proceedings of the 13th Symposium on Operating System and Design Implementation (OSDI '18), CA, USA, 2018.
- [10] Ramnatthan Alagappan, Aishwarya Ganesan, **Jing Liu**, Andrea Arpaci-Dusseau, and Remzi Arpaci-Dusseau. *Fault-Tolerance, Fast and Slow: Exploiting Failure Asynchrony in Distributed Systems*. In Proceedings of the 13th Symposium on Operating System and Design Implementation (OSDI '18), CA, USA, 2018.
- [11] **Jing Liu**, Tongwei Ren, Bingkun Bao and Jia Bei. *Depth-aware Layered Edge for Object Proposal*. In Proceedings of IEEE International Conference on Multimedia and Expo (ICME '16), Seattle, USA, 2016.
- [12] **Jing Liu**, Tongwei Ren and Jia Bei. *Elastic Edge Boxes for Object Proposal on RGB-D images*. In Proceedings of International Conference on Multimedia Modeling (MMM '16), Miami, USA, 2016.

## JOURNALS AND WORKSHOPS

- [1] Inho Choi, Anand Bonde, **Jing Liu**, Joshua Fried, Irene Zhang, and Jialin Li. *ML-native Dataplane Operating Systems*. In ACM SIGOPS Asia-Pacific Workshop on Systems (APSys '25), South Korea, 2025.
- [2] **Jing Liu**, Xiangpeng Hao, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, and Tej Cheped. *Shadow Filesystems: Recovering from Filesystem Runtime Errors via Robust Alternative Execution*. In Proceedings of the 16th ACM Workshop on Hot Topics in Storage and File Systems (HotStorage '24), Santa Clara, CA, 2024.
- [3] Suli Yang, **Jing Liu**, Andrea C. Arpaci-Dusseau, and Remzi H. Arpaci-Dusseau. *Principled Schedulability Analysis for Distributed Storage Systems using Thread Architecture Models*. In ACM Transactions on Storage (TOS), March, 2023.

[4] **Jing Liu**, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, and Sudarsun Kannan. *File Systems as Processes*. In 11th USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage '19), Renton, WA, 2019.

[5] Irene Zhang, **Jing Liu**, Amanda Austin, Michael Lowell Roberts, and Anirudh Badam. *I'm Not Dead Yet! The Role of the Operating System in a Kernel-Bypass Era*. In Workshop on Hot Topics in Operating Systems (HotOS '19), Bertinoro, Italy, 2019.

[6] **Jing Liu**, Tongwei Ren, Yuantian Wang, Sheng-Hua Zhong, Jia Bei, and Shengchao Chen. *Object proposal on RGB-D images via elastic edge boxes*. In Neurocomputing (NEUCOM), 236:134-146, May, 2017.

## TEACHING EXPERIENCE

<b>Computer Sciences Department of UW-Madison, WI</b> <i>Instructor</i> Class: Introduction to Operating Systems.	Summer 2023
<b>Computer Sciences Department of UW-Madison, WI</b> <i>Teaching Assistant</i> Class: Distributed Systems. Instructor: Prof. Andrea Arpaci-Dusseau	Spring 2022, Spring 2023
<b>Computer Sciences Department of UW-Madison, WI</b> <i>Teaching Assistant</i> Class: Advanced Operating System. Instructor: Prof. Andrea Arpaci-Dusseau	Spring 2018
<b>Software Institute of Nanjing University</b> , Nanjing, China <i>Teaching Assistant, and Head Teaching Assistant</i> Class: Computer Operating System. Instructors: Prof. Bin Luo & Prof. Jidong Ge	Spring 2015, Spring 2016

## SERVICE

Shadow PC Co-chair, EuroSys '26	
Program Committee: SOSP '25, APSys '25, NSDI '26, OSDI '26, SOSP '26, FAST '27	
External Review Committee: ATC '24	
Artifact Evaluation Committee: ATC/OSDI '22	
Topic (OS & Emerging Hardware) Moderator, SOSP '21 Diversity Workshop	
President, W-ACM, UW Madison Chapter of ACM's Women in Computing	Aug. 2021 – Aug. 2022
External Reviewer: FAST '18	

## MENTORING

<i>A General Inference Engine for Sparse Attention</i>	
<b>Zihan Zhao</b> , University of Virginia, Ph.D. student	May 2025 – Present
<b>Shengjie Lin</b> , Georgia Tech University, Master student	Aug. 2025 – Present
<i>Efficiency of Agentic AI Systems</i>	
<b>Yi Chen</b> , University of Michigan, Ph.D. student	Jun. 2025 – Present
<b>Kaiming Wang</b> , Shanghai Jiao Tong University, Undergraduate	Oct. 2025 – Present
<i>Safe, Fast, and In-Situ Tuning of Performance-Critical Constants in OS Kernels</i>	
<b>Zhongjie Chen</b> , Tsinghua University, Ph.D. student	Apr. 2025 – Present
<b>Yulong Tang</b> , Renmin University of China, Master student	Sep. 2025 – Present
<i>Smart Caching in Vector Storage Systems</i>	
<b>Sukjoon Oh</b> , KAIST, Ph.D. student	Oct. 2024 – Present

*Unstable Foundations of eBPF Programs (EuroSys '25)*

**Shawn Zhong**, UW-Madison, Ph.D. student

Jun. 2024 – May 2025

*DiskANN Case Study for Application Reaction to Filesystem Failure*

**Luozhong Zhou**, UW-Madison, Undergraduate

May 2023 – Nov. 2023

## PRESENTATIONS AND INVITED TALKS

### **Systems Research: What We Build, Why We Build, and How We Do It?**

Invited talk at MSRA Interns Event, Beijing, China.

Aug. 2025

Invited talk at MSRA – PKU Open Day, Beijing, China.

Jul. 2025

Invited talk at MSRA Open Day to Students, Beijing, China.

Jun. 2025

### **Fast, Transparent Filesystem Microkernel Recovery with Ananke**

Talk at FAST '25, Santa Clara, CA.

Feb. 2025

### **Scale and Performance in a Filesystem Semi-Microkernel.**

Invited talk at UIUC, Champaign, IL.

Oct. 2022

Invited talk at ENS de Lyon – France, virtual.

Mar. 2022

Invited talk at Samsung MSL Tech Talk, virtual.

Jun. 2021

0.5emTalk at SOSP '21, virtual.

Oct. 2021

### **File Systems as Processes.**

Talk at HotStorage '19, Renton, WA.

Jul. 2019

### **Elastic Edge Boxes for Object Proposal on RGB-D Images.**

Talk at MMM '16, Miami, MI.

Jan. 2016