Zikai Liu

zikai.liu@outlook.com
+41 76 546 78 72
zikailiu.com/about
zikai-liu
STF H 326, Stampfenbachstrasse 114, 8006 Zürich, Switzerland

Education

2023–Present **ETH Zurich,** PhD Student in Computer Science

- Supervised by Prof. Timothy Roscoe. Systems Group. Anticipated graduation date: 11/2027.

2021–2023 **ETH Zurich,** MSc in Computer Science

- Major in Data Management Systems. GPA 5.67/6.00.
- Thesis: Generating Trustworthy I²C Stacks Across Software and Hardware.

2017–2021 **University of Illinois at Urbana-Champaign,** BSc in Computer Engineering

Zhejiang University, BEng in Electronics and Computer Engineering

- Dual Bachelor's degrees. GPA 3.93/4.00. Highest Honor.
- Thesis: Using Concolic Execution to Provide Automatic Feedback on LC-3 Programs.

Focus Areas Operating Systems, Computer architecture, Compiler, Software Testing, Cloud Computing.

Experience

2018–2021 **ZJU-UIUC Robotics Team,** Control/Vision Group Lead and Project Manager

- Led the development of embedded control programs and a vision system for robots.
- Managed the development process for 30+ team members as the Project Manager.

Summer 2020 **NetEase Games,** Platform Engineer Intern

- Developed a driver module with GUI to manage various joysticks through a unified interface, providing plug-and-play user experience on the NetEase android emulator.

Projects

Present **The Enzian Project**

- Enzian: a research computer built at the ETH Systems Group with a cache coherence interconnect (similar to CXL) between a server-class CPU and an FPGA.
- Investigating accelerating applications by exploiting coherence protocols at the message level.

Present **The Trustworthy Board Management Controller (BMC) Project**

- BMCs: exist in every modern computer to manage critical low-level functionalities.
- Worked on securing BMCs by adopting a formally verified OS kernel and generating hybrid software/hardware drivers using model checking, code generation, and high-level synthesis.

Present **The Sockeye Project**

- The project: formally models increasingly complicated hardware to build better OS.
- Worked on integrating seL4 microkernel as one of the CPU drivers.

Fall 2022 **In-Hand 3D Scanning System on a Mixed Reality Headset**

- Developed a system for near-real-time 3D scanning and reconstruction of irregular geometries, using the depth camera on Microsoft HoloLens 2.

2018–2021 **KLC3 Symbolic Execution Engine**

- A symbolic execution engine for LC-3 (an educational assembly) based on KLEE for automatic bug detection and test case generation, written in C/C++.
- Used to provide automatic end-to-end feedback to 100+ sophomore students for their LC-3 assignments in Fall 2020. Got uniformly positive survey responses.

Spring 2021 **Wireless Charging Desk with Vision-Assisted Automatic Alignment**

- Designed and implemented a desk that automatically aligns wireless charging coils with devices using a mechanical system and computer vision.
- Senior design team project. We got the Most Interdisciplinary Project Award.

Fall 2020 **Pipelined RISC-V Processor Design Project**

- Designed and simulated a 5-stage pipelined RV32I processor with parameterized caches, tournament branch predictions, and a prefetcher, written in SystemVerilog.

More on my website 🌐 zikailiu.com/projects

Publications

*Equal contributors

Mainframe-Style Channel Controllers for Modern Disaggregated Memory Systems. **Zikai Liu**, Jasmin Schult, Pengcheng Xu, Timothy Roscoe. *16th ACM SIGOPS Asia-Pacific Workshop on Systems (APSys'25)*, October 2025 (to appear).

Efeu: generating efficient, verified, hybrid hardware/software drivers for I2C devices. Daniel Schwyn*, **Zikai Liu***, Timothy Roscoe. *20th European Conference on Computer Systems (EuroSys'25)*, March–April 2025.

Verified fault handling for modern board management controllers. Ben Fiedler, **Zikai Liu**, David Cock, Timothy Roscoe. *20th Formal Aspects of Component Software (FACS'24)*, September 2024.

End-to-End Automation of Feedback on Student Assembly Programs. **Zikai Liu**, Tingkai Liu, Qi Li, Wenqing Luo, Steven S. Lumetta. *36th ACM/IEEE International Conference on Automated Software Engineering (ASE'21),* November 2021.

Skills

Programming	C/C++, Python, SystemVerilog/VHDL, OCaml, C#, JavaScript, HTML/CSS, SQL, Rust, assembly.
Operating Systems	Unix/Linux commands, shell scripts, kernel development; Windows drivers.
Tools and Frameworks	Build systems (e.g. CMake), version controls (e.g. Git), compiler frameworks (e.g. LLVM), FPGA toolchains (e.g. Vivado), debuggers and profilers (e.g. GDB), GUI frameworks (e.g. Qt).
Miscellaneous	Adobe Photoshop/Illustrator/Lightroom, photography, Unity engine.