Zikai Liu

STF H 326, Stampfenbachstrasse 114, 8092 Zürich, Switzerland
zikai.liu@inf.ethz.ch
https://zikailiu.com/about
+41 76 546 78 72

Education

2023–Present	**ETH Zürich,** PhD Student in Computer Science • Supervised by Prof. Timothy Roscoe. Systems Group.
2021–2023	**ETH Zürich,** MSc in Computer Science • Major in Data Management Systems. GPA 5.67/6.00.
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.
Selected Courses	Computer System Engineering, Microarchitecture, Operating Systems, Compiler, Automated Software Testing, Machine Learning, Cloud Computing Architecture.

Experience

2018–2021	**ZJU-UIUC Robotics Team,** Control Group Lead & Project Manager/Vision Group Lead • Led the development of embedded control programs, parameter tuning utilities, and a vision-assisted automatic aiming system for combat robots, in C/C++ and Python. • Scheduled development timeline and arranged meetings as the project manager.
Fall 2020	**ZJU-UIUC Joint Institute**, Teaching Assistant • Organized lab sessions and assignments, and deployed an automatic feedback system (KLC3 below) for sophomore students of the ECE220 Fall 2020 ZJUI session.
2020.6–2020.8	**NetEase Games,** Platform Engineer Intern • Developed a driver module and GUI to manage various joysticks through a unified interface, providing plug-and-play user experience on the NetEase android emulator.

Projects

Fall 2022	**End-to-End In-Hand 3D Scanning System on Mixed Reality Headsets** • Developed a system for near-real-time 3D scanning and reconstruction for irregular geometries, using the depth camera on Microsoft HoloLens 2.
Summer 2022	**Virtualize Linux on seL4 for Enzian System** • Developed Linux VM on seL4 (a formally verified microkernel) for Enzian, a research server-class CPU/FPGA computer developed at the ETH Systems Group.
2020–2021	**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.
Spring 2020	**BoxHead Video Game on FPGA**
	• Developed a game on FPGA combining hardware and software. Wrote VGA driver, SRAM controller, hardware graphic engine in SystemVerilog, and game logic in C.
Fall 2019	**x86 Operating System Development Project**
	• Designed and simulated an i386 OS with kernel functions, a scheduler with waitlists, SVGA driver with hardware acceleration, and GUI, written in C and assembly.
	• Our team got a prize at the UIUC ECE391 design competition :)
Fall 2019	**UWB Indoor Positioning System Project**
	• Designed and analyzed a high-accuracy (~20cm) indoor positioning system using Decawave UWB development boards. CS498IoT team project.

Publications

Zikai Liu, "Generating Trustworthy I2C Stacks Across Software and Hardware," Master Thesis, ETH Zürich, September 2023.

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

Zikai Liu, "Using Concolic Execution to Provide Automatic Feedback on LC-3 Programs," Bachelor Thesis, University of Illinois at Urbana-Champaign, June 2021.

Presentations

<u>**Zikai Liu**</u>, Steven S. Lumetta, "Caching Results from KLEE's Independent Solver," *2nd KLEE Workshop*, June 2021.

Zikai Liu, <u>Tingkai Liu</u>, Qi Li, Wenqing Luo, Steven S. Lumetta, "Timely Feedback on Assembly Assignments Using KLEE," *2nd KLEE Workshop*, June 2021.

Activities

2018–2019	**Campus New Media Center**, Vice Minister of Vision Department
	• Organized department recruitment, training and photography activities.
2019-2020	**Campus Art and Creative Studio**, Founding Member
	• Participated in designing, manufacturing and selling of art products.