Zikai Liu

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Education

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.
2021–Present	**ETH Zurich,** MSc in Computer Science • Major in Data Management Systems. Current GPA 5.61/6.00.
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 and Presentations

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," Senior Thesis, University of Illinois at Urbana-Champaign, June 2021.

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

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

Tingkai Liu, **Zikai Liu**, Richard W. Jones, "The Evolution of Air Pollution Monitoring and Modeling in Zhejiang Province," *14th IEEE Conference on Industrial Electronics and Applications (ICIEA)*, June 2019.

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.