

CONTACT

227 Coordinated Science Lab
1308 West Main Street
Urbana, IL 61801

Email: gaohany2@illinois.edu
Website: elijah-ye.github.io
Phone: (510) 520-7207
LinkedIn: linkedin.com/in/elijahye

TECHNICAL SKILLS

Programming: SystemVerilog (Advanced), C/C++ (Advanced), UVM/OVM, Python, CUDA, Assembly (x86, RISC-V)
Hardware Design: RTL Design, CPU Architecture, RISC-V, x86, CXL/PCIe, Cache Design, Pipeline Optimization
Hardware Verification: Design Verification, UVM/OVM, Functional Coverage, System-Level Testing, FuSa Testing
Technologies/Tools: Verdi, VCS, Git, Linux, Intel Extension for PyTorch, Performance Analysis, Intel MLC

WORK EXPERIENCE

Rivian Automotive

May 2025 – Aug 2025

Design Verification Intern, Special Project

Champaign, IL

- Increased design verification coverage to over 90% via a new, more efficient coverage generation flow
- Enhanced an existing integration test suite, reducing the failure rate from over 40% to less than 5%
- Developed a new system-level test to validate memory access, creating a baseline for future verification tests
- Authored new FuSa tests to validate error injection and interrupt mechanisms for critical components

University of Illinois at Urbana-Champaign

Jan 2025 – Current

Teaching Assistant for Digital Systems Laboratory, ECE 385

Champaign, IL

- Evaluated SystemVerilog/FPGA projects and microprocessor system implementations
- Conducted technical demonstrations and assessments of digital circuits, state machines, and SoC designs
- Graded lab reports covering combinational/sequential logic, timing analysis, and hardware-software co-design

Rivian Automotive

Apr 2024 – Aug 2024

Design Verification Intern, Special Project

Champaign, IL

- Created a performance monitor to track AXI transaction signals to test read and write operation performance
- Increased toggle coverage of chip blocks by creating and implementing new targeted tests
- Conducted system-level verification for the DUT using a custom UVM testbench
- Developed and executed detailed test plans, identifying bugs and successfully debugging and resolving issues

University of Illinois at Urbana-Champaign

Jan 2023 – Dec 2024

Teaching Assistant for Computer System Engineering, ECE 391

Champaign, IL

- Led weekly lab and discussion sessions, teaching students about operating system concepts, including process scheduling, virtual memory, file systems, and system call implementation
- Offered comprehensive support to students, addressing inquiries regarding x86, virtual memory, scheduling, file systems, and course materials

- Graded over 300 student assignments and conducted demos of their custom operating systems
- Collaborated with professors in the grading process for midterms and final exams

Headline (a Venture Capital Company based in San Francisco) May 2022 – Aug 2022
Frontend Developer Intern Remote

- Added display features and security auditing in a custom integration with Gmail that exposes several million highly sensitive emails across the organization by relying on Rails backend and React front end
- Implemented internal management tool with React.js; restructured API calls to improve page latency by 30%
- Improved performance of Streak CRM and Gmail integrations by fixing timeout bugs

PUBLICATIONS & RESEARCH

“CXL Memory Device Characterization” **2025 (In Progress)**
Advisor: *Nam Sung Kim* Dec 2024 – Present

- Conducted silicon validation of Samsung CMM-H CXL 2.0 memory prototype in server lab environment
- Configured system HW/SW across multiple server platforms: analyzed motherboard specs, modified BIOS settings, optimized grub/kernel parameters, and validated device enumeration using lspci and numactl
- Performed latency and bandwidth characterization using industry-standard Intel MLC benchmarking suite
- Compared performance metrics against internal lab CXL SSD implementations

“Exploiting Intel Advanced Matrix Extensions (AMX) for LLM Inference” **2024**
IEEE Computer Architecture Letters (CAL), 2024, IEEE Best Paper Award

Advisor: *Nam Sung Kim* Dec 2023 – Apr 2024

- Contributed to research on Intel Extension for PyTorch utilizing Intel Sapphire Rapids CPU with AMX
- Developed CPU-GPU heterogeneous computing techniques to accelerate Large Language Model inference
- Collaborated with Prof. Nam Sung Kim's research group to advance computational efficiency and speed

RELEVANT PROJECTS

Multi-stage RISC-V Processor | *SystemVerilog, RISC-V* Sept 2023 – Dec 2023
Course Participant Champaign, IL

- Designed and implemented RV32I processor in SystemVerilog with data & branch hazard detection as team
- Achieved 28.6% frequency increase and 47% cache stall reduction, securing 3rd place among 30 groups
- Applied timing analysis and logic optimization principles for hardware-software co-design

Linux Kernel | *C, x86* Oct 2022 – Dec 2022
Course Participant Champaign, IL

- Created a Linux Kernel featuring 3 terminals and 6 processes
- Implemented read-only File System, Round-Robin Scheduling, 4kB and 4mB Paging
- Successfully handled interrupts, exceptions, and system calls from user programs

FPGA Flappy Bird Game | *SystemVerilog, Python, C* Jan 2022 – May 2022
Course Participant Champaign, IL

- Programmed an FPGA to output a VGA signal to draw game visuals to a monitor

- Enabled keyboard-FPGA communication via SPI to run C-based keyboard drivers on SoC
- Wrote Python scripts to compress PNG format into MIF format to instantiate onto the FPGA on-chip memory
- Implemented state machine in SystemVerilog to animate a walking character depending on keyboard inputs
- Detected collisions between the map and the player with state machine-controlled memory address into ROMs

EDUCATION	University of Illinois Urbana-Champaign Master of Science, Electrical and Computer Engineering	Aug 2024 – May 2026 GPA: 3.83/4.00
	University of Illinois Urbana-Champaign Bachelor of Science, Computer Engineering	Aug 2020 – Dec 2023 GPA: 3.96/4.00
Relevant Coursework		
Computer Architecture, SoC/Hardware Design, VLSI System Design (Spring 2026), Network Protocol, Operating System, Data Structure, Algorithm		
AWARDS AND DISTINCTIONS	IEEE Best Paper Award	2024
	A.R. "Buck" Knight Scholarship, ECE Department	Aug 2023
	Oakley Award in Electrical and Computer Engineering	Mar 2023
	Bradley A. Simmons Memorial Scholarship, ECE Department	Sep 2022