

ETHAN CHENG

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EDUCATION

Johns Hopkins University, Baltimore, MD
M.S. Electrical Engineering

Expected May 2028

University of California, Los Angeles, CA
B.S. Electrical Engineering

March 2026

EXPERIENCE

California NanoSystems Institute (CNSI) (<https://cnsi.ucla.edu/>)
Lab TA for Technology Training Program

Los Angeles, CA
Fall 2025 — Spring 2026

- Supported a class of 10 students training in a Class 100/1000 cleanroom environment, emphasizing safe tool operation and process discipline.
- Provided hands-on guidance across core fabrication modules including photolithography, thin-film deposition, dry/wet etching, metrology, process control, and CAD.
- Explained underlying physical and chemical principles behind each process step to bridge lecture concepts with real fabrication workflows.
- Assisted students in debugging process issues, interpreting metrology data, and understanding sources of variation and yield loss.

ECE 121DA Semiconductor Processing and Device Design (UCLA)
Student

Los Angeles, CA
Winter 2025 — Spring 2025

- Studied end-to-end MOSFET fabrication, including oxidation, diffusion, ion implantation, lithography, and metallization.
- Designed semiconductor devices with emphasis on tradeoffs between performance, scaling, and manufacturability.
- Used TCAD tools to simulate process steps and predict electrical characteristics prior to fabrication.
- Fabricated functional MOSFETs starting from blank silicon wafers, performing full process integration and device testing.

Linux Users Group at UCLA (<https://linux.ucla.edu/>)
President

Los Angeles, CA
Fall 2024 — Spring 2026

- Led a student organization dedicated to open-source software, Linux systems, and technical literacy.
- Planned and hosted workshops, talks, and hands-on events covering Linux fundamentals, tooling, and system administration.
- Managed club finances, budgeting, and reimbursements while coordinating with UCLA administration.
- Fostered an inclusive technical community focused on peer learning and knowledge-sharing.

A+ Accounting and Tax Services (<https://aplusact.com/>)
Accountant's Assistant

Daly City, CA
August 2021 — May 2022

- Assist in preparing individual and small-business tax returns in compliance with federal and state regulations.
- Reconciled client accounts and financial records, identifying discrepancies and ensuring accuracy.
- Assisted with document organization and client communication during peak tax season.

PROJECTS

2048 on an FPGA
Project for IEEE at UCLA: <https://www.ieeebruins.com/>

Los Angeles, CA
Fall 2024 — Spring 2025

- Collaborated in a team of three to implement the game *2048* entirely in Verilog on an FPGA.
- Designed digital logic for game state management, tile movement, and score tracking.
- Implemented VGA graphics output, including real-time rendering and display timing control.
- Gained experience with hardware debugging, simulation, and synthesis constraints.

X-Y Recorder
Personal Project: <https://www.nijika.org/projects/plotter/>

Los Angeles, CA
Summer 2024

- Repurposed an X-Y recorder to draw arbitrary images from digital input.
- Implemented a subset of G-code, parsing motion commands and coordinating axis movement.
- Programmed an Arduino to convert G-code instructions into analog control voltages.
- Developed intuition for motion control, coordinate transforms, and hardware interfacing.

Teleprinter

Personal Project: <https://www.nijika.org/projects/typewriter/>

Los Angeles, CA
Summer 2024

- Converted an electric typewriter into a serial-controlled teleprinter.
- Reverse-engineered the keyboard matrix and soldered a microcontroller to emulate keystrokes.
- Implemented keyboard scanning logic and serial communication with a PC.
- Enabled arbitrary text sent over serial to be physically printed by the typewriter.

Class Forum

Class Project for “CS 35L Software Construction (UCLA)”

Los Angeles, CA
Spring 2024

- Designed and built a full-stack web application using PostgreSQL, Flask, and React.
- Implemented backend REST APIs and managed application infrastructure.
- Applied web security best practices including CORS handling, XSS mitigation, HttpOnly cookies, and cryptographic primitives.
- Gained experience balancing usability, security, and maintainability.

Path-following Car

Class Project for “ECE 3 Introduction to Electrical Engineering (UCLA)”

Los Angeles, CA
Fall 2023

- Designed a control system enabling a small car to autonomously follow a marked path.
- Interpreted infrared sensor data and transformed readings into a continuous error signal.
- Implemented PID control to minimize tracking error and ensure stable motion.
- Tuned control parameters empirically to improve responsiveness and robustness.

ZWC

Personal Project: <https://github.com/yadayadajaychan/zwc>

South San Francisco, CA
Summer 2023

- Developed a program to embed hidden data using zero-width Unicode characters.
- Explored UTF-8 encoding and its implications for text processing.
- Designed and implemented a custom CRC scheme to detect transmission errors.
- Studied the mathematical basis of CRCs, including polynomial division over finite fields.

Solar Boat

Engineering and Robotics Club at Skyline College

San Mateo, CA
August 2022 — May 2023

- Worked on a multidisciplinary team to develop motor control systems for a solar-powered boat.
- Programmed an Arduino to interface with electronic speed controllers and an LCD display.
- Read and interpreted hardware datasheets to understand electrical and timing constraints.
- Designed control logic with real-world hardware limitations in mind.
- Competed in the California Solar Regatta against other collegiate teams.

SKILLS

- **Programming Languages:**
 - C/C++ (systems programming, low-level memory management)
 - Python (scripting, data analysis, automation)
 - Java (object-oriented design)
 - Go (concurrent systems, database-backed applications)
 - MATLAB (numerical analysis, signal processing)
- **Hardware & Embedded Systems:**
 - Verilog (digital logic design, FSMs, FPGA-based systems)
 - Arduino (microcontroller programming, sensor and actuator interfacing)
 - Serial communication (UART)
 - VGA display interfacing
 - PID control systems
- **Semiconductor Fabrication & Devices:**
 - CMOS process flow
 - Photolithography
 - Thin-film deposition
 - Dry and wet etching
 - Metrology and process characterization
 - MOSFET device fabrication and testing
 - TCAD process and device simulation
- **Software & Systems:**

- Linux (command-line tools, system configuration)
- Git (version control, collaborative workflows)
- Shell scripting
- Build systems and debugging tools
- **Web & Application Development:**
 - Flask (backend APIs)
 - React.js (frontend development)
 - PostgreSQL (relational database design)
 - Web security fundamentals (CORS, XSS mitigation, authentication, cryptography)
- **Engineering Foundations:**
 - Circuit theory (DC/AC analysis, nodal and mesh methods, Thevenin/Norton equivalents),
 - Analog and digital signal processing (sampling, filtering, frequency-domain analysis),
 - Linear systems and signals,
 - Control systems (feedback, stability, PID control),
 - Electromagnetism (Maxwell's equations, EM wave propagation, fields and potentials),
 - Semiconductor physics (band theory, carrier transport, PN junctions, MOS capacitors),
 - Digital logic and computer architecture,
 - Reading and applying hardware datasheets,
 - Debugging across hardware–software boundaries