Charlie Chen

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EDUCATION

Harvard University Cambridge, MA

Bachelor of Science in Electrical Engineering, Minor in Computer Science | GPA: 3.96/4.0 May 2027

- Relevant Courses: Computing Hardware, Circuits Devices & Transduction, Systems & Control, Physics E&M, Systems Programming, Intro to Machine Learning (MIT), Intro to Distributed Computing, Data Structures & Algorithms

Friends Select School Philadelphia, PA

High School Diploma | GPA: 4.31/4.0, Phi Beta Kappa | Student President, Robotics Club Founder June 2023

TECHNICAL SKILLS

Software & Programming: SystemVerilog, Arduino, MATLAB, LTSpice, Python, Git, Linux

Hardware & Systems: FPGA Programming, Analog & Digital Circuit Design, Embedded Systems, Oscilloscope, Function Generator, Soldering

ENGINEERING PROJECTS

32-bit Arithmetic Logic Unit (**ALU**) | SystemVerilog, FPGA, Vivado Sept. - Oct. 2025

- Built gate-level ALU using hierarchical modular design for arithmetic, logic, & shift operations via muxes & submodules
- Designed carry-lookahead adder to reduce propagation delay & integrated zero, equal, & overflow flag circuitry
- Created comprehensive testbenches for edge-case validation & synthesized design on Xilinx FPGA using Vivado

VLA Robot Arm | Python, Arduino, Computer Vision June – July 2025

- Wrote camera handler to undistort, crop, & stream Meta Aria glasses video into SmolVLA recording/inference pipeline
- Developed Arduino firmware to drive arm servo (with stabilizing capacitor) over lightweight custom serial protocol
- Engineered teleoperation recorder to log camera frames, servo angles, & tasks to curate dataset for model fine-tuning
- Implemented autonomous action inference loop that parses inputs & issues live servo commands to complete task

Reverb Karaoke Machine | Filters, Op Amps, DAC, Soldering April 2025

- Built passive high-pass & low-pass filter stages with op-amp buffers to condition microphone signals for Arduino ADC
- Coded Arduino signal processing firmware at 8 kHz sample rate, featuring dynamic compression and reverb effects
- Engineered 10-bit R-2R DAC with low-pass output filters to reconstruct & smooth processed audio for speaker playback

Mask Detector | PyTorch, OpenCV, Arduino, Embedded Software Sept. 2021 – Dec. 2022

- Built face detection pipeline with optimized MobileNetV2 (91% accuracy) to spray unmasked people with water
- Wrote Arduino firmware for serial-controlled relay actuation and prototyped/soldered the relay & motor circuit

EXPERIENCE

Harvard Ability Lab | Cambridge, MA June 2025 – Present

Undergraduate Researcher (PI: Patrick Slade)

- Analyzing vision-language-action model performance on egocentric robotic arms in human-robot interaction tasks
- Engineered human-mounted rig for supernumerary robotic arm by designing custom CAD chest plate & harness
- Teleoperated arm to build high-fidelity 10K+ frame dataset for VLA fine-tuning & quantified movement using OpenCap
- Designed protocol with varying interaction complexity, human movement, etc. on ADL tasks to benchmark performance

ADDITIONAL SKILLS & INTERESTS

Fluent Languages: English, Mandarin

Interests: Hiking, Cooking, Running, Speedcubing