

Charlie Chen

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EDUCATION

Harvard University Cambridge, MA
Bachelor of Science in Electrical Engineering | GPA: 3.96/4.0 May 2027 (expected)

- Currently Enrolled: Systems & Control, Circuits Devices & Transduction, Computing Hardware, Physics E&M
- Relevant Courses: Intro to Electrical Engineering, 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: Python, C, C++, Arduino, MATLAB, Linux, Git, PyTorch, Fusion360
Hardware: Soldering, Op Amps, Function Generator, Oscilloscope, Power Supply, Multimeter

PROJECTS

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
- Implemented Arduino firmware to drive arm servo (with stabilizing capacitor) over lightweight custom serial protocol
- Built teleoperation recorder to log camera frames, servo angles, & tasks to curate labeled 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, Digital Signal Processing, Soldering April 2025

- Built passive high-pass & low-pass filter stages with op-amp buffers to condition microphone signals for Arduino ADC
- Developed 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

Client-Server Chat App | Sockets, Custom Protocol, JSON, gRPC, SQL, Python March 2025

- Developed chat app with real-time message delivery with offline queuing, secure account creation, and authentication
- Designed & implemented JSON-based and custom wire protocol (10+ times throughput increase) using sockets
- Re-architected the system with gRPC, evaluating impacts on client/server structure, testing, and overall performance

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
- Developed 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

OTHER

Fluent Languages: English, Mandarin
Interests: Music, Hiking, Cooking, Speedcubing