

# BRADY LIN

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## EDUCATION

Northwestern University | McCormick School of Engineering

**B.S. Electrical Engineering** + Segal Design Certification

GPA: 3.94 (Major)

Relevant Coursework: Advanced Mechatronics, MCU Programming, Electronics Design

Evanston, IL

September 2023 – June 2027

## EXPERIENCES

Center for Robotics and Biosystems

Evanston, IL

Undergraduate Researcher – Robotic Systems Engineer

March 2025 – Present

- Designed and built a 1.5m × 1.5m CoreXY gantry robotic system to autonomously manage a 150-drone battery-swap array.
- Applied DFM/DFA principles in Onshape CAD, accounting for 3D printed overhangs, print/laser-cut tolerances, and machining tool clearance; fabricated 30+ unique parts using 3D printing, laser cutting, and machining (drill press, band saw, milling).
- Minimized unwanted torque and cut X-axis racking from ~8° to <0.5° by analyzing belt kinematics, reselecting and sourcing belts/pulleys, redesigning gantry architecture (H-bot → CoreXY), and optimizing member geometry in CAD.
- Integrated hardware/software with ESP32-S3 on PlatformIO (C++), implementing closed-loop stepper motor control and I<sup>2</sup>C networking across 20+ nodes in the charging array.

Creative Engineering & Robotic Arts Studio (CERAS)

Evanston, IL

Founder & Chief Engineer

April 2024 – Present

- Engineered a six-armed robotic drummer on mixed-voltage rails (24/8.4/5/3.3 V); built a cross-platform RasPi + MCU architecture that hosts audio/MIDI and drives real-time actuation while syncing a face monitor display.
- Built firmware on Teensy 4.1 in C to synchronize 6 servos, 2 solenoids, and 3 stepper motors; implemented a Python MIDI parser that applies a velocity-delay curve to shift events, yielding no effective latency between audio playback and hits.
- Led the Onshape CAD and fabrication of 40+ mechanical, grounding, and thermal management components, applying DFM principles (tolerances, tool access, overhang limits) and prototyping via CNC, 3D printing, laser cutting, and waterjet;
- Conducted a 12-person multidisciplinary team through 3 weekly meetings and public performances attended by 100+ people, showcasing the robot's ability to play live music with synchronized motion choreography.

## PROJECTS

Expressive Violin-Style MIDI Instrument

Nov 2024 – July 2025

- Engineered a violin-inspired USB-MIDI controller, integrating fully 3D-printed hinge mechanisms with tactile buttons + FSRs for velocity and aftertouch sensing and a SoftPot fingerboard with external 16-bit ADC for continuous pitch-bend.
- Developed firmware in C SDK on Raspberry Pi Pico 2, using multicore programming, interrupt-driven architecture, and bandwidth optimization to achieve <6 ms latency, while debugging hardware/circuits with oscilloscopes, logic analyzers, and serial monitors.
- Validated mechanical system through 30+ rapid prototyping iterations, tested for >10,000 actuation cycles; sleek, ergonomic body manufactured with laser-cut acrylic + 3D-printed housing.

Phone Lockbox with Behavioral Reinforcement System

April 2025 – Present

- Built an Arduino-based phone lockbox integrating MP3 player, OLED display, LED feedback, servo locking mechanism, and wireless charging system, all coordinated over I<sup>2</sup>C. Minimized RAM and flash memory usage through data structure optimization.
- Implemented randomized audio-visual sequences with synchronized prompts that 'gaslight' users into reducing phone use.

## SKILLS

Embedded: PlatformIO, C, Python, RTOS, serial protocols (I<sup>2</sup>C, SPI, UART, USB), microcontrollers (ESP32, Teensy, Arduino, RasPi Pico)

Hardware debugging: multimeter, serial monitor, oscilloscope, logic analyzer, and JTAG programmer

CAD and EDA: SolidWorks, Onshape, Fusion360, AutoCAD, KiCAD

Fabrication and prototyping: soldering (THT/SMT), 3D printing, laser cutting, waterjetting, milling, drill pressing, bandsawing, lathing

Language: Mandarin (native; experience coordinating with Chinese manufacturers on sourcing & fabrication), English (native)

## ADDITIONAL

Content creation: 190k subscribers, monetized & sponsored; skilled in video/audio editing (FCPX, Logic Pro).

Northwestern: Asterik A Capella (Singer), NU Crew (Rower), CERAS, NUSTARS (Engineer), CSA (Executive), ISA (Events coordinator).