

Simon Lee Kaminer

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Mechanical Engineering | Embedded Systems & Robotics

EDUCATION

Northwestern University - Evanston, IL

Combined B.S./M.S. Program

B.S. Mechanical Engineering (Robotics), June 2028 | M.S. Electrical Engineering, June 2029

Minor: Artificial Intelligence | GPA: 3.87/4.00 | McCormick Dean's List (Spring 2025-present)

Relevant Coursework: Robotic Manipulation, Advanced Mechatronics, Dynamic Systems, Signals and Systems, Fundamentals of Circuits, Product Design, Intro to AI

EXPERIENCE

Aurora Innovation, Mountain View, CA - Safety Systems Engineering Intern

Summer 2026

- Merged safety-analysis code into Aurora's production autonomous vehicle repository, including a permanently enforced validation rule.
- Implemented IPOG combinatorial test generation, reducing autonomous vehicle safety test sets by 90%+ while preserving full 3-way coverage.
- Developed a three-stage workflow and rule set to translate AV safety requirements into testable parameters and identify safety-critical scenario combinations.
- Evaluated 2,000+ intersections and frontage roads against truck geometry, behavioral limits, and ODD constraints to support safe route expansion.

HAND-ERC Lab, Northwestern University - Undergraduate Researcher

Winter 2026-present

- Assembled and integrated two OpenArm robots, including motor wiring, CAN communication, and physical benchmarking.
- Developed ROS 2 trajectory execution and closed-loop motor control; calibrated joint offsets and diagnosed multi-arm positioning errors.

Meemo (seed-stage consumer hardware startup) - Lead Firmware & Robotics Engineer

Spring 2025-present

- Led cross-functional development of a UWB child-separation alert system, coordinating firmware, electronics, and mobile app delivery.
- Integrated UWB ranging, ESP-NOW communication, and fault detection; diagnosed power and sensor failures through hardware testing.
- Developed C/C++ firmware for ESP32 wearables, implementing pairing state machines, persistent device state, and fault recovery.

SELECTED PROJECTS

StarkHacks Hardware Hackathon - Autonomous Whiteboard-Cleaning Robot

April 2026

- CAD-designed and 3D-printed custom robot components; integrated ESP32 motor control and ToF sensing in a 36-hour build.
- Developed OpenCV/ArUco localization and dirty-zone detection to guide autonomous whiteboard navigation and cleaning.

Custom STM32 Flight Controller Firmware - In Progress

- Developed bare-metal C firmware for an STM32F405 flight controller, implementing USB communication, boot diagnostics, and hardware bring-up.
- Integrated accelerometer and gyroscope data into firmware to estimate the flight controller's roll and pitch.

TECHNICAL SKILLS

Embedded Firmware: C/C++, STM32, ESP32, Arduino, PlatformIO, microcontroller bring-up

Hardware & Interfaces: CAN, UART, I2C, SPI, UWB, ESP-NOW, PWM, motor drivers, sensor integration, hardware debugging

Robotics & Controls: ROS 2, closed-loop control, trajectory execution, joint calibration, multi-arm debugging, attitude estimation

Programming & Tools: Python, MATLAB, OpenCV, Git, Linux, CMake

Mechanical Design & Fabrication: SolidWorks, 3D printing, CNC machining

Test & Prototyping: Oscilloscopes, multimeters, soldering, bench testing

LEADERSHIP

Applied Technologies Club - Co-Founder | 2025-present

- Co-founded a student engineering club focused on hands-on electronics and robotics projects.

Associated Student Government - Student Senator & SOFO Account Executive | 2024-present

- Co-authored campus-safety legislation securing a streetlight at a high-traffic crosswalk.
- Allocate \$3M+ annually across 100+ student organizations and advise groups on funding strategy.