Alexander Kagan

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Education

Stevens Institute of Technology — Hoboken, NJ
Bachelor of Engineering in Mechanical Engineering | **GPA: 4.00/4.00** — *Expected May 2029*
Master of Engineering in Robotics (accelerated B.E./M.Eng. program) — *Expected December 2029*

Coursework: Circuits and Systems, Programming & Algorithms, Statics, Differential Equations, Physics (Mechanics), Engineering Design
Honors: Pinnacle Scholar, Edwin A. Stevens Scholarship, Presidential Achievement Scholarship, Dean's List (every semester)
Activities: ASME, Society of Asian Scientists and Engineers (SASE), IEEE, Launchpad entrepreneurship program

Skills

Programming & Embedded: C++ (Arduino, ESP32), Python, ROS, Linux (Ubuntu), MQTT, Git, sensor and power wiring, breadboard prototyping
Design & Prototyping: SolidWorks (parts and assemblies), FDM 3D printing (infill and wall tuning), design for 3D printing, fit iteration
Lab: Thermo KingFisher (BindIt 4.1), ISO 8655 pipette testing

Experience

Advanced Robot Manipulators Lab, Stevens (Prof. Long Wang) — Hoboken, NJ
Undergraduate Research Assistant — *November 2026 - Present*

- Training a robotic hand model to grasp and pick up an object, writing the code in **Python** and **C++** and running it in **ROS** on **Ubuntu Linux**.
- Designing an end-effector attachment that mounts a **kidney biopsy needle** to a **7-DOF robotic arm**, so the arm can hold and guide the needle during a biopsy.
- Setting up **stylus-based teleoperation** so an operator can control the robot by hand, and handling **system integration** to get the hardware and software working together.

Cedars-Sinai Medical Center — Los Angeles, CA
Research Intern — *June 2026 - August 2026*

- Led development of **InstrumentIQ**, an AI-assisted tool that turns a plain-English extraction request into a validated, ready-to-run protocol for the lab's **Thermo KingFisher** DNA/RNA extraction instruments.
- Mapped Thermo's proprietary protocol file format so protocols move between the lab's **2 instruments** instead of being rebuilt by hand for each one.
- Validated the tool in **3 full instrument runs with zero errors**, then wrote the documentation and handed it off to the next developer.
- Verified **6 Eppendorf pipette models** against **ISO 8655**, calculating accuracy and precision and identifying failure points.

Wearable Robotic Systems Lab, Stevens (Prof. Damiano Zanotto) — Hoboken, NJ
Undergraduate Research Assistant, AI Sole project — *November 2025 - May 2026*

- **3D printed** the ankle-mount and enclosure prototypes for a wearable gait-analysis insole, tuning print quality so each CAD revision could be fit-checked on accurate parts.
- Developed ankle-mount **locking mechanism concepts** as the team weighed a slimmer profile against a more secure fit.

Projects

Autonomous Navigation Robot | ***Team Lead, Stevens Smart Arena*** — *Jan 2026 - May 2026*

- Led a 3-person team and owned the CAD, wiring and code; the robot reached all **4 targets in about 1 minute** against a 3-minute limit and earned full marks.
- Took the 3D-printed **SolidWorks** chassis through **7 revisions**, each fixing a sensor mounting, wheel clearance or fit problem found in testing.
- Picked a 3-sensor ultrasonic layout with a weighted decision matrix, wired the power and sensor harness, and wrote the **Arduino (C++)** navigation code.

IoT Smart Watering System | ***Team Lead, ENGR 111*** — *Oct 2025 - Dec 2025*

- Built a friction-fit **SolidWorks** enclosure and an **ESP32** system with 4 sensors and a pump, streaming data to an **MQTT** broker every 10 minutes.
- Programmed closed-loop watering (20 mL daily dose plus a 30/40% moisture band) that kept soil **above 40% moisture for 5 days**.
- Traced sensor saturation to pump motor noise on a shared 5 V rail and fixed it by moving the sensors to a separate **3.3 V rail**.