

# Jaeho Cho

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## EDUCATION

### The Cooper Union for the Advancement of Science and Art

*Master of Engineering in Electrical Engineering*

New York City, NY

Aug 2024 – May 2026\*

### The Cooper Union for the Advancement of Science and Art

*Bachelor of Engineering in Electrical Engineering, Bioengineering Minor*

New York City, NY

Aug 2022 – May 2026\*

- Half Tuition Scholarship | Myron Coe Scholarship | Full Tuition Scholarship 2025-2026
- Courses: Frequentist Machine Learning, Digital Signal Processing, Communication Theory, Computer Architecture, Integrated Circuit Engineering, Theoretical Neuroscience, Medical Imaging, Bio-Instrumentation & Sensing

## RESEARCH/WORK EXPERIENCE

### Master's Thesis | Dr. Koo

Jun 2025 – Present

*The Cooper Union* • New York, NY

- Investigating the application of neuromorphic computing to design an ultra-low-power neural signal processor.
- Designed and simulated a low-power chopper low noise amplifier (LNA) in Cadence Virtuoso using 65nm CMOS technology.

### Undergraduate Researcher | Dr. Long (Long Lab)

Jun 2025 – Present

*NYU Langone Health* • New York, NY

- Analyzing budgerigar recordings to extract acoustic features and cluster syllables using methods like UMAP and HDBSCAN along with supervised and unsupervised deep learning models for segmenting and classifying bird vocalizations.
- Automated budgie tutoring and data collection using ROS2 and a custom robot budgie, reducing manual observation time and increasing data throughput.

### Independent Researcher | Dr. Mintchev

Jan 2025 – Present

*The Cooper Union* • New York, NY

- Working on the theoretical analysis of a weight- and reward-dependent spike-timing-dependent plasticity (W-R-STDP) rule, with an emphasis on deriving the governing equations and establishing rigorous stability and convergence conditions.
- Developed low level computational models, from neural encoding and decoding to multi-compartment models with synaptic inputs.

### Undergraduate Researcher | Otolaryngology

Feb 2024 – Present

*Mount Sinai* • New York, NY

- Evaluated the Gemini API for multi-modal surgical workflow analysis, using synced endoscopic and external operating room videos to detect and label surgical instruments and phases.
- Developed and validated a deep learning system using Ultralytics YOLO to recognize and label surgical instruments in endoscopic sinus and skull base procedures. Achieved overall precision of 96.4%, recall of 94.8%, and mAP50 of 96.6%.
- Designing and building an active assistive device to improve surgeon ergonomics during long procedures, evaluating performance with EMG fatigue analysis.
- Evaluating the ergonomics of ENT surgeons using the Opal V2R system (IMU sensors) and FREEEMG (EMG sensors) to measure muscle fatigue during office and OR procedures.

### Project Lead | Dr. Shah's lab (miliLab)

Sep 2023 – Present

*The Cooper Union* • New York, NY

- MARVIN: Led development of an open-source robotic arm system for human-robot interaction, integrating ROS2, MoveIt2 for motion planning, and Mediapipe for real-time pose landmark detection.
- Designed a kinematic mapping system from human anatomical landmarks to the joint angles of the OpenMANIPULATOR-X robotic arm.
- ROSS: Building a small-scale spherical robot, designed in Fusion360 and controlled with an ESP32-CAM microcontroller.
- Designed and fabricated a PCB in Altium for an eTextile sensor, presented at the 2024 ASTM International Exo Games.
- Evaluation of passive exoskeleton using EMG fatigue assessment involving nonparametric analysis in Python.
- Mentored and trained 4 students in advanced topics Fusion360, ROS2, circuit design, soldering, and PCB design.

PwC • Seoul, South Korea

- Developed and optimized advanced time-series forecasting models utilizing GluonTS, Chronos, and Darts Python libraries to generate price predictions for flagship petrochemical products with a 3-month forecasting horizon.
- Refactored backend data pipelines in Django, transitioning from MongoDB to ClickHouse and improving performance.
- Built a Django service that automates article aggregation via private and public APIs to enhance LLM-driven sentiment analysis.

## **PUBLICATIONS**

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[1] C. Stonebraker, J. Cho et al., “Multi-modal Surgical Workflow Analysis with Gemini API,” **Submitted** to the *2026 American Rhinologic Society (ARS) at Combined Otolaryngology Spring Meetings (COSM)* to be published in the *International Forum of Allergy & Rhinology*, 2026.

[2] J. Cho and S. Klymchuk, “MARVIN: Web-Based Teleoperation of a Dual-Arm Robot,” **Submitted** to the *TEI 2026 Student Design Competition*, 2026.

[3] C. Stonebraker, J. Cho et al., “Development of a Computer Vision System for Surgical Instrument Analysis During Endoscopic Sinus and Skull Base Surgery,” **Submitted** to the *2026 North American Skull Base Society (NASBS) Annual Meeting* to be published in the *Journal of Neurological Surgery Part B: Skull Base*, 2026.

## **SKILLS**

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- Programming: Python, MATLAB, Rust, C, C++, Verilog, VHDL, Git, Docker, JavaScript, SQL
- Software: Cadence Virtuoso, LTspice, Altium, Vivado, Fusion360, ROS2, Gazebo, Blender, Onshape