

Jaeho Cho

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EDUCATION

The Cooper Union for the Advancement of Science and Art

New York City, NY

M.Eng, B.Eng in Electrical Engineering (Joint), Bioengineering Minor

*Aug 2022 – May 2026**

- Half Tuition Scholarship | Myron Coe Scholarship | Full Tuition Scholarship 2025-2026
- Courses: Digital Signal Processing, Communication Theory, Engineering Electromagnetics, Digital VLSI System Design, Integrated Circuit Engineering, Theoretical Neuroscience, Microfabrication & Biomedical Device Design

RESEARCH EXPERIENCE

Master's Thesis | Dr. Jabeom Koo

Jun 2025 – Present

The Cooper Union • New York, NY

- Conducting research on neuromorphic architectures for ultra-low-power brain-machine interfaces, with current efforts focused on designing a neuromorphic processing block (low-power ADC) to follow the LNA.
- Designed a chopper-stabilized low-noise amplifier in 65-nm CMOS using Cadence Virtuoso, achieving 41 dB gain over 0.6 Hz–5 kHz, 1.6 μ W power consumption, and a noise-efficiency factor (NEF) of 1.7.

Undergraduate Researcher | Dr. Michael Long

Jun 2025 – Present

NYU Langone Health • New York, NY

- Developed signal-processing and machine-learning pipelines for vocalization analysis, including acoustic feature extraction, unsupervised clustering, dimensionality-reduction techniques, and deep neural models for syllable segmentation and classification.
- Engineered a ROS2-based automated tutoring and data-collection robot enabling long-duration, minimally supervised behavioral experiments.

Independent Researcher | Dr. Stanislav Mintchev, Dr. Brian Frost Laplante

Jan 2025 – Present

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- Developing reduced-order models of spiking neural networks using delay differential equations and mean-field methods to study recurrent activity and stability.
- Implementing computational models from Dayan and Abbott's *Theoretical Neuroscience* to study multi-compartment dynamics, network attractors, and plasticity rules in Python.

Undergraduate Researcher | Dr. Jonathan Dropkin, Dr. Alfred Marc Illoreta

Feb 2024 – Present

Mount Sinai • New York, NY

- Built and evaluated multi-modal surgical workflow analysis pipelines using the Gemini API, synchronizing endoscopic and external OR video streams for surgical instrument and phase detection.
- Trained and optimized a deep learning model (Ultralytics YOLO) for real-time surgical instrument recognition in endoscopic sinus and skull-base procedures, achieving 96.4% precision, 94.8% recall, and 96.6% mAP50.
- Designing an assistive device to improve surgeon ergonomics during extended procedures, assessing effectiveness through EMG-based fatigue analysis.
- Conducting quantitative ergonomics studies of ENT surgeons using IMU (Opal V2R) and EMG (FREEEMG) sensor arrays; developing signal-processing pipelines for posture and mechanical-exposure analysis.

Project Lead | Dr. Mili Shah

Sep 2023 – Present

The Cooper Union • New York, NY

- Mentoring and training four students in ROS2, PCB design, circuit prototyping, and mechanical CAD workflows.
- Led development of a dual-arm robot; implemented motion-planning pipelines and web-based teleoperation using the ROS 2 framework.
- Building a small spherical robot for decentralized swarm self-assembly; designed and prototyped the mechanical structure and implemented communication and distributed-control routines.
- Designed and fabricated a custom PCB for an e-textile sensor, presented at the 2024 ASTM International Exo Games.

PUBLICATIONS

[1] J. Cho, C. Stonebraker et al., "Effect of a pilot, office-based ergonomic rhinology intervention on mechanical exposure, musculoskeletal symptoms, and usability." **In progress**

- [2] 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.
- [3] J. Cho and S. Klymchuk, “MARVIN: Web-Based Teleoperation of a Dual-Arm Robot,” **Submitted** to the *TEI 2026 Student Design Competition*, 2026.
- [4] C. Stonebraker, J. Cho et al., “Development of a Computer Vision System for Surgical Instrument Analysis During Endoscopic Sinus and Skull Base Surgery,” **Accepted** 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.

WORK EXPERIENCE

Data and AI Intern | Hanwha TotalEnergies Petrochemical
PwC • Seoul, South Korea

May 2024 – Aug 2024

- Developed time-series forecasting models using GluonTS, Chronos, and Darts to generate three-month market predictions for petrochemical products.
- Refactored Django backend pipelines during a transition from MongoDB to ClickHouse, improving data throughput and service latency.
- Implemented a Django-based article aggregation service integrating private and public APIs to support LLM-driven sentiment analysis.

SKILLS

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