

# Jaeho Cho

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## EDUCATION

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

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

New York City, NY

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  $\mu$ 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

Jan 2025 – Present

*The Cooper Union* • New York, NY

- Working on the theoretical analysis of a weight- and reward-dependent spike-timing-dependent plasticity rule, with an emphasis on deriving the governing equations and establishing rigorous stability and convergence conditions.
- Modeled and analyzed frameworks in Dayan and Abbott's Theoretical Neuroscience textbook in Python like multi-compartment models with multiple synaptic inputs or Hopfield networks with Hebbian learning.

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

Feb 2024 – Present

*Mount Sinai* • New York, NY

- Developed 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 active 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 ROS 2, PCB design, circuit prototyping, soldering, and CAD (Fusion 360).
- 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**

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

May 2024 – Aug 2024

- 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.

**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