

JAEHYEON (ZACH) PARK

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Education

The Cooper Union for the Advancement of Science and Art

Aug. 2020 – May 2026

Bachelor of Engineering in Mechanical Engineering / Minor in Bioengineering

GPA: 3.83/4.00

- **Memberships:** Tau Beta Pi (Engineering Honor Society), ASME, and BMES
- **Related Coursework:** Mechatronics, Biomechanics, Feedback Control, Signal Processing, Design & Prototyping, Sports Medicine, Materials Science, Mechanics of Materials, Stress & Applied Elasticity, Mechanical Vibrations

Research & Technical Experiences

Active Upper-Limb Exosuit for Surgical Tremor Mitigation

New York, NY

Senior Capstone Project Lead

Aug. 2025 – Present

- Develop sEMG-based active wearable armrest that follows voluntary arm motion and provides adaptive support for static postures, reducing musculoskeletal strain during Ear, Nose, and Throat (ENT) and microsurgical procedures
- Leverage NIST-provided Auxivo EduExo Pro to analyze commercial exosuit designs and develop custom ergonomic prototype optimized for surgical use, redistributing load from shoulders to hips and thighs
- Collaborate with Mount Sinai ENT clinicians and Nicholas Institute of Sports Medicine and Athletic Trauma Lab, using BTS FREEEMG system and IRB-approved passive exosuit dataset for validation and motion analysis

Mount Sinai BioDesign

New York, NY

Undergraduate Research Intern

Aug. 2025 – Present

- Engineer patient-specific Chronic Subdural Hematoma (CSDH) surgical simulation platform to test Periscope Kit, neuroendoscopic CSDH evacuation tool enabling active suction through craniotomy access
- Collaborate with neurosurgeons and industry partners including Medtronic and Stryker to validate device prototypes such as soft Intracerebral Hemorrhage (ICH) phantom and burr-hole surgical testbed

The Nicholas Institute of Sports Medicine and Athletic Trauma (NISMAT)

New York, NY

Volunteer Research Assistant

Jul. 2025 – Aug. 2025

- Processed 3D infrared marker-based motion capture and force plate data using Visual3D for kinematic & kinetic analysis
- Performed 1D paired t-tests in MATLAB SPM1d to assess countermovement jump asymmetry post-ACL reconstruction

Research Experiences for Undergraduates (REU) at Wake Forest University

Winston-Salem, NC

Summer Undergraduate Researcher (Manuscript in Preparation)

May 2025 – Aug. 2025

- Quantified ISS pre/post-flight vertebral geometry, cortical thickness, vBMD, and spinal muscle volume via qCT/MRI
- Built and validated subject-specific FE spine models predicting strength loss and fracture risk during launch/landing
- Funded by NASA, supporting Risk of Injury from Dynamic Loads countermeasure efforts for astronaut spine health

Ovelia Health (Johns Hopkins University Incubator Start-Up)

Baltimore, MD

Product Design Lead

Feb. 2025 – Present

- Lead product design and development of digital health platform for Polycystic Ovary Syndrome (PCOS) screening and cycle tracking integrating ML-based emotional support and symptom assessment
- Refine UI/UX through 50+ user/clinician interviews (NSF I-Corps) and collaborate with Johns Hopkins Bloomberg School of Public Health and Aspect Health to prepare IRB-approved clinical validation of screening algorithm
- Secured \$23k in funding through accelerator programs and won 2nd place at 2025 TEDCO Expo Pitch Competition

Professor David Wootton Group at Cooper Union

New York, NY

Undergraduate Researcher

Jan. 2025 – Present

- Design benchtop Arteriovenous Fistula (AVF) flow loop with embedded MEMS flow and vibration sensors for quantitative hemodynamic testing
- Develop hemodynamically optimized testbed that replicates physiological vascular flow and AVF failure conditions
- Miniaturize benchtop rig into wireless, skin-safe wearable sensor module through iterative CAD and system co-design

Professor Steffen Ihlenfeldt at Technische Universität Dresden

Dresden, Germany

Summer Undergraduate Researcher (Manuscript in Preparation)

May 2024 – Aug. 2024

- Analyzed electromagnetic forming rebound behavior and optimized process conditions via LS-DYNA simulations
- Trained TFT deep-learning models on to predict form depth and current amplitude from limited experimental data
- Implemented Monte Carlo Dropout to quantify uncertainty, guiding synthetic data creation to improve model accuracy

Professor Michelle Rosen Group at Cooper Union

Undergraduate Researcher

New York, NY

Jan. 2024 – May 2025

- Conducted FEA to characterize soft actuator nonlinear hyperelastic behavior and wall-thickness variation instabilities
- Applied origami-inspired geometries to prototype compact soft robots aimed at disaster-response navigation
- Modeled and tested manufacturing process, including silicone molding techniques, to optimize actuator performance

Professor Dongjun Lee at Seoul National University

Undergraduate Researcher

Seoul, South Korea

Jun. 2021 – Aug. 2021

- Developed modular AGVs with ROS-based multi-point coupling architecture enabling swarm collaboration
- Created Blender animations visualizing collaborative AGV motion and optimized docking/connection sequences

Awards & Scholarship

Maroon & Gold Labs Full Grant Winner

Nov. 2025

- Awarded \$5,000 Cooper Union incubator funding supporting Ovelia Health clinical study and validation

NIH NIBIB/VentureWell DEBUT Challenge 2nd Place Winner

Oct. 2025

- Engineered wearable AVF monitoring device for early detection of fistula stenosis using piezoelectric sensors
- Awarded \$15k prize and invited to present at 2025 BMES Annual Meeting, selected from 123 teams nationwide

Pfizer Digital Hackathon 2nd Place Winner (Team Lead)

Sep. 2025

- Prototyped HIPAA- and COPPA-compliant digital companion platform for pediatric cancer patients and caregivers
- Led team and presented our solution at Pfizer NY Headquarters to 50+ Pfizer Digital professionals

Pfizer Inaugural Digital Hackathon 2nd Place Winner

Sep. 2024

- Built NLP-based virtual companion app promoting student mental health and resilience across NYC schools

Cooper Union President Half & Full Tuition Scholarship

Aug. 2020 – May 2026

Poster Presentations

“Personalizing an Average Male Human Body Model With MRI-Derived Muscle Data From Long-Duration Astronauts”

- Biomedical Engineering Society (BMES) Annual Meeting (Oct. 8-12, 2025) / Full Travel Grant from Wake Forest University and Cooper Union
- Wake Forest University Summer Symposium (Jul. 31, 2025) / Awarded Undergraduate Research Presentation Certificate

“Optimizing Small Wind Turbine Efficiency Through Attaching a Novel Structure”

- National Conference for Undergraduate Research (NCUR) (Apr. 7-9, 2025) / Full Travel Grant from Cooper Union

“Real-Time Multi-Drone Control through Hand Gesture Recognition with MediaPipe”

- Cooper Union Vertically Integrated Projects (VIP) Spring Showcase (Apr. 25, 2024)

Extracurricular Activities

The Cooper Union for the Advancement of Science and Art

New York, NY

Mechanical Engineering Department Student Ambassador

Sep. 2025 – Present

- Serve as Bioengineering ambassador and act as representative speaker for ME department’s external presentations

Vice President of Biomedical Engineering Society (BMES)

Aug. 2025 – Present

- Manage research mentoring and funding; organize faculty research panels and guest lectures by external companies

President of Korean Association of Cooper Union (KACU)

Aug. 2024 – Present

- Spearhead Korean cultural events and major-specific mentorship to help 30+ students adapt to school

Exam Proctor

Jan. 2024 – Jan. 2025

- Ensured equitable testing access for students with disabilities while securely handling confidential exam data

Skills & Certificates

Programming Languages & Frameworks: Python, PyTorch, MATLAB, C++, ROS, React Native, JavaScript

Software & Tools: Visual3D, JMP, NI LabVIEW, Mimics, LS-DYNA, Fusion 360, Arduino, SolidWorks, MS Office

Certificates (BMES/CITI Program): Biomedical Investigators; GCP for Clinical Trials with Investigational Drugs and Biologics (ICH Focus); Fundamentals and Perspectives in Medical Product Regulation for Biomedical Engineers; Optimized Data-Driven AI for Biomedical Data Analysis