Jack Caputo

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EDUCATION

PhD Physics 2026 – Present
Auburn University *Auburn, AL*
- Graduate Teaching Assistant

B.S. Physics, Minor in Mathematics 2022 – 2026
Stevens Institute of Technology *Hoboken, NJ*
Overall GPA: 3.88/4.00 | Program GPA: 3.87/4.00 | Dean's List: Fall 2022 – Spring 2025
Awards: Physics Leadership Award, Edwin A. Stevens Scholarship 2022-26, Stevens Presidential Scholarship 2022-26

PROJECTS

Visual Reconstruction with EEG Sep 2025 – May 2026
Stevens Institute of Technology *Hoboken, NJ*
- Created an EEG encoder to represent EEG data as an image with low-level features of the original stimulus
- Built an EEG-to-image pipeline using machine learning (denoising diffusion) to reconstruct original stimulus using extracted low-level features (https://github.com/IsaacVanB/visual-reconstruction-eeg)
- Similarity metrics SSIM and LPIPS showed a statistically significant increase in similarity when low-level features were used during reconstruction
- Project featured in Nautilus magazine ("Using Brain Waves to Translate Thoughts into Pictures") and university's Innovation Expo ("More Than Meets the Mind's Eye: Physics Students Develop New Techniques to Turn Thoughts Into Pictures")

Visual Decoding with EEG Jan – May 2025
Stevens Institute of Technology *Hoboken, NJ*
- Created and optimized a convolution neural network (CNN) for classifying images from publicly available EEG datasets using TensorFlow/Keras in Python
- Achieved a classification test accuracy of 31.6%, on par with top research groups (max 34.4%), over a dataset of 20 diverse data classes
- Concluded our and others' low overall accuracies implied CNNs were incorrect structure for this task; hypothesized alternative structures and methods (cf. above, *Visual Reconstruction with EEG*)

RESEARCH EXPERIENCE

Experimental Optics Researcher Jun 2025 – Jan 2026
Stevens Institute of Technology *Hoboken, NJ*
- Constructs tabletop optical setups centered around geometric and detour phases to eventually analyze and improve nanophotonic metasurfaces
- Experimentally clarifies the optical detour phase as a type of geometric phase by utilizing phase-shifting interferometry to gather data and analyze in MATLAB
- Created and presented poster at university's Undergraduate Research Symposium

Research Experience for Undergraduates (REU) Participant Jun – Aug 2024
Cornell University, Cornell Laboratory for Accelerator-based ScienceS and Education (CLASSE) *Ithaca, NY*
- Examined and corrected non-physical behavior in resonant radiofrequency systems in Ansys HFSS by implementing proposed algorithm, enabling calculation of crucial parameters
- Culminated in written procedure to be used by others at Cornell when designing accelerator systems
- Introduced to CST Studio Suite; summarized findings in 15-minute PowerPoint and detailed project report in LaTeX

Undergraduate Researcher Dec 2023 – May 2024
Stevens Institute of Technology, Quantum Enhanced Science and Technology Lab *Hoboken, NJ*

- Followed graduate student's project to produce 3D scans of imitation tissue sample using novel single-photon elastography method
- Performed data cleaning and analysis on large datasets using MATLAB; introduced to LiDAR and optics-based experimentation methods

PRESENTATIONS

- Caputo, J.; Benthuysen, I. V. "Visual Reconstruction with EEG". Innovation Expo, Stevens Institute of Technology, May 2026. (Poster)
- Caputo, J. "Geometric Phase Shifting Interferometry". Undergraduate Research Symposium, Stevens Institute of Technology, October 2025. (Poster)

INVOLVEMENT

Resident Assistant Aug 2023 – May 2026
Stevens Institute of Technology, Office of Residential Education *Hoboken, NJ*

- Fostered community in dormitory hall by developing relationships with residents, planning creative and original events, and designing educational bulletin boards
- Applyed trained skills in crisis management, referral and reporting, campus housing policy enforcement, documentation, and other administrative tasks
- Completed such routine duties as ensuring the ongoing safety and proper condition of dormitories and residents, being on-call biweekly, staffing the dormitory front desk for 3 hours weekly, attending regular staff meetings, etc.

Vice President, Society of Physics Students (SPS) Sep 2023 – Sep 2025
Stevens Institute of Technology *Hoboken, NJ*

- Assisted President in collaborating with and delegating other board members to create semesterly plan and execute weekly events
- Served as liaison between SPS and Physics Department, facilitating collaboration on numerous events and outreach

Undergraduate Student Tutor Jan 2024 – May 2026
Stevens Institute of Technology, Academic Support Center *Hoboken, NJ*

- Tutored undergraduate students in several physics and mathematics courses for 3+ hours weekly, encouraging independent discovery of solutions and deeper understanding of material

Contributing Writer (Palaver) Spring 2026
Stevens Institute of Technology, Academic Support Center *Hoboken, NJ*

- Wrote for university's self-contained, limited release publication (titled *Palaver*) containing back-and-forth written dialogues between students and professors to explore philosophical questions

SERVICE

Physics Department Student Representative Oct 2023 – May 2026
Stevens Institute of Technology *Hoboken, NJ*

- Co-hosted outreach and events including science demonstrations at local schools, telescope viewings, and major conferences
- Facilitated seminars exposing undergraduate Physics students to research from Physics faculty

PROFESSIONAL SOCIETIES

Sigma Pi Sigma, *Member* Apr 2026 – Present
American Physical Society, *Member* Jan 2025 – Present