Howard Wang

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EDUCATION

Swarthmore College — Swarthmore, PA 2022 - 2026

- **B.A.** in Mathematics; **B.S.** in Engineering Swarthmore, PA
- **GPA:** 3.82/4.00
- **Relevant Courses:** Multivariable Calculus, Linear Algebra, PDEs, Probability, Stochastic Processes, Biomedical Data Analysis, Engineering Mechanics, Thermofluids, Physical Systems & Optics, Electrical Circuits.

PUBLICATION & CONFERENCES

- **Wang, H.**, Moser, A. Frequency Domain Analysis of Infant and Adult EEG During Object Recognition. [Poster] Society for Neuroscience Conference, Washington, DC, 2024.

- **Wang, H.**, Miller, J., Towles, J. System to Measure Thumb-Tip Movement Produced by Muscles. [Poster] NCUR, Long Beach, CA, 2024.

AWARDS & HONORS

- $6,000 Allen and Naomi Schneider Summer Research Fund, Swarthmore College. Jun 2025
- $6,000 Tarble Summer Research Fellowship, Swarthmore College. Jun 2024
- $5,500 Surdna Summer Research Fellowship, Swarthmore College. Jun 2023
- $1,500 Society for Neuroscience Conference Travel Award, Swarthmore College & Sigma Xi. Oct 2024
- $1,000 NCUR Conference Travel Award, Sigma Xi & Provost's Office. Apr 2024
- Outstanding Presentation Award, Society for Neuroscience Annual Meeting. Oct 2024

RESEARCH EXPERIENCES

Spatial Modeling of T Cell Dynamics in HIV Reservoir Formation Newark, DE

Dr. Ryan Zurakowski, Department of Biomedical Engineering, University of Delaware Sep 2024 - Present

- Designed and implemented a PDE-based spatial model simulating CD4+ T cell and HIV reservoir dynamics under antiretroviral therapy.
- Analyzed steady-state behavior and spatial heterogeneity of infected and uninfected T cell populations across lymphoid tissue.
- Developed MATLAB code to visualize and compare treatment outcomes across varying immune and drug parameters.
- Currently testing model robustness against stochastic perturbations and biological variability.

Frequency Domain Analysis of EEG in Infant and Adult Object Recognition Swarthmore, PA

Dr. Allan Moser & Dr. Benjamin Zinszer, Department of Engineering, Swarthmore College Jan 2023 – Jan 2025

- Applied Fast Fourier Transform to EEG data from infants and adults during object recognition tasks to extract 18 spectral features.
- Performed classification using SVM, achieving 96.60% accuracy based on theta/(alpha+beta) ratio features.
- Mapped coherence across parietal and occipital electrodes, identifying key developmental differences in visual processing.
- Presented results at Society for Neuroscience 2024; writing thesis on frequency-domain biomarkers of neural development.

Designing a Motion Capture System for Thumb-Tip Kinematics Swarthmore, PA

Dr. Joseph Towles, Department of Engineering, Swarthmore College Sep 2023 - May 2024

- Developed an opto-mechanical system to measure 3D thumb-tip trajectories in cadaveric specimens during individual muscle activation.
- Calibrated and validated motion capture system using digitized anatomical reference frames and mechanical rig testing.
- Analyzed variation in tip displacement across intrinsic thumb muscles, contributing to models of motor control and rehabilitation.
- Co-authored abstract and presented findings at NCUR 2024.

Electromagnetic Interference (EMI) Analysis in Electrical Enclosure Testing Remote

Tenco Engineering Inc. May 2025 - Present

- Created a Python data processing pipeline to extract, clean, and visualize radiated EMI frequency profiles from chamber test logs.
- Built comparison tools for identifying emission peaks across configurations and test environments.
- Developed diagnostic plots to support design revisions and client reporting for electronic enclosures.
- Contributed to automation of quality assurance process in pre-certification EMI testing workflow.

Molecular Dynamics Simulation of Tyrosine Phosphatase Binding Salt Lake City, Utah
Dr. Jason Moore, Department of Computational Biomedicine, Cedars-Sinai Medical Center May 2022 – Aug 2022

- Constructed all-atom protein models using UCSF Chimera and set up simulations in GROMACS to evaluate ligand binding to tyrosine phosphatase.
- Conducted energy minimization and molecular dynamics to explore conformational shifts under thermal fluctuation.
- Interpreted hydrogen bonding patterns and residue-level interactions to assess active site accessibility for inhibitor design.

TEACHING EXPERIENCES

Grader Mechanics & Electrical Circuits & Computer Engineering & Stochastic Jan 2024 – May 2024

- Evaluated homework and problem sets for two core engineering courses with 120+ enrolled students.
- Provided accurate and timely feedback on conceptual and numerical problem-solving assignments.
- Collaborated with course instructors to clarify grading rubrics and adjust problem difficulty based on class performance.

EXTRACURRICULARS AND LEADERSHIP EXPERIENCES

Senior Admissions Fellow Swarthmore, PA
Swarthmore College Admissions Office May 2025 - Present

- Selected through a competitive application process to represent the college in interviewing prospective applicants.
- Conducted evaluative interviews and provided written reports used in the admissions decision process.
- Collaborated with admissions officers on outreach and programming for prospective students.

Team Vice Captain – Men's Cross Country Swarthmore, PA
Swarthmore College Varsity Athletics Mar 2022 - Present

- Led team warm-ups, organized travel logistics, and mentored first-year athletes on training and recovery practices.
- Helped foster a cohesive and motivated team environment through peer support and communication with coaches.

President – Swarthmore Calligraphy Club Swarthmore, PA
Penn Undergraduate Biotechnology Society Sep 2022 - May 2023

- Revived and led weekly workshops promoting East Asian calligraphy and ink-based visual art.
- Designed events to attract new members and collaborated with the Intercultural Center on programming.

Photo Editor – The Phoenix (Swarthmore Student Newspaper) & Swarthmore College Media Swarthmore, PA
Campus Publication & Social Media Sep 2022 – Present

- Managed a team of photographers and curated weekly image content for front-page and feature articles.
- Covered major campus events and theatrical productions with high-impact visual storytelling.

SKILLS & INTERESTS

- **Programming:** Python, Java, MATLAB, R, C/C++, LabView, Git
- **Technical Skills:** Machine learning, Signal processing, EEG analysis, ODE/PDE modeling
- Art & Media: Chinese calligraphy, Ink painting, Studio Ghibli–style illustration, Documentary filmmaking (ultrarunning film with 20K+ views)
- **Languages:** English (fluent), Mandarin Chinese (native)
- **Interests:** Ultrarunning (6× 100-milers), Photography, Visual storytelling