

Zachary Hale

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Education

University of Pittsburgh, Swanson School of Engineering

Pittsburgh, PA

B.S. Engineering Science, Nanoengineering track

Expected: May 2027

Minors in Chemistry, Industrial Engineering, and Bioengineering

Relevant Coursework: Micro & Nano Manufacturing, Nanoengineering, Operations Research

GPA: 3.2

Publications & Presentations

- **Hale, Z.**, et al. “From Fetal Signals to Precision Home Monitoring: A Data-Driven Continuum for Pediatric Congenital Heart Care.” *In preparation* (shared first author).
- **Hale, Z.**, et al. “Determining the Impact of Socioeconomic Status on Athletic Performance Using Machine Learning.” *2022 GSET Research Journal*. Presented at the 2022 NJ GSET Symposium and the 2022 MIT IEEE URTC.

Research Experience

Gottlieb-Sen Lab

Le Bonheur Children’s Hospital, Memphis, TN

Researcher

June 2026–August 2026

- Authored the study protocol for a two-site trial (Le Bonheur, CHOP) of a novel pulse oximeter in arterial-line ICU/CICU infants, coordinating clinicians, an engineering firm, and the lab team.
- Led a team in the NSF Regional I-Corps program; conducted 18 customer discovery interviews and coded them in QDA software. Placed 2nd and received \$1,500 award.
- Built an application to interface with the prototype device and enforce protocol adherence during data collection.

NanoProducts Lab

Pittsburgh, PA

Undergraduate Researcher

May 2025–August 2025

- Awarded a competitive Swanson School SURI grant to study carbon nanotube (CNT) manufacturing under Dr. Mostafa Bedewy.
- Ran 7 experiments during a week at Brookhaven National Laboratory, capturing environmental-TEM video of CNT growth.
- Wrote processing pipelines for more than 20 TB of high-speed, high-noise microscopy data.
- Identified and characterized several previously unreported growth phenomena, informing follow-on experiments.

Gottlieb-Sen Lab

Johns Hopkins School of Medicine

Engineering Research Intern

June 2024–September 2024

- Developed and tested a wearable monitor for post-operative infants with pediatric cardiac surgeon Dr. Danielle Gottlieb-Sen.
- Enrolled four cardiac ICU infants into the study and wrote enrollment documentation for future patients.
- Implemented signal processing algorithms (Pan-Tompkins) to extract heart and respiratory rate from raw waveforms.
- Observed 14 complex cardiac surgeries, including arterial switch, Norwood, Glenn, and TOF repair.

Leadership

Building Outreach Networks for Discovery in STEM (B.O.N.D.S.)

Pittsburgh, PA

Secretary

January 2026–Present

- Founding member of a new Pitt organization bringing STEM education and mentorship to underserved Pittsburgh communities.
- Coordinate biweekly *Discovery Days*: three-hour interactive lectures for middle and high school students.
- Organized fundraisers raising over \$300 ahead of the student government allocations cycle.

Hillel Jewish Student Union

Pittsburgh, PA

VP of Operations

January 2025–Present

- Elected by the student membership to direct the organization’s programming and growth.
- Manage the club’s university-held account, coordinating disbursements with administration and student government.

Honors Organic Chemistry

Pittsburgh, PA

Teaching Assistant

Fall 2025

- Supported Prof. Paul Floreancig in a 28-student course; held weekly office hours averaging 6 students.
- Led exam review sessions and wrote original practice problems.

Roseland First Aid Squad

Roseland, NJ

Volunteer Emergency Medical Technician

September 2021–August 2023

- Assessed patients and gathered medical history under time pressure; maintained vehicle and equipment readiness.

Skills & Interests

Technical: L^AT_EX, C++, Python, MATLAB, Fusion 360, Microsoft Office Suite

Research Interests: Medical devices, MEMS, microfluidics, congenital heart disease

Other Interests: Ceramics, climbing, camping, teaching, current events