

# Sebastian Mostek

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## EDUCATION

### CORNELL COLLEGE OF ENGINEERING

#### SIBLEY SCHOOL OF MECHANICAL AND AEROSPACE ENGINEERING

*Candidate for Bachelor of Science in Mechanical Engineering*

Ithaca, NY

Anticipated Graduation December 2025

GPA 3.96

### UPPER DARBY HIGH SCHOOL

*Valedictorian, Class of 2022*

Upper Darby, PA

GPA 99/100

### RELEVANT COURSEWORK

*Advanced Dynamics & Vibrations, Material Mechanics, Fluid Dynamics, System Dynamics, Heat Transfer, Quantum Mechanics, Differential Equations, Electric Circuits, Wave Physics, Mechanical Design, Probability & Statistics*

## RESEARCH EXPERIENCE

### Laboratory for Advanced Materials and Manufacturing

*Researcher*

Ithaca, NY

June 2025 – Present

- Developed a novel nondimensionalized theoretical model of the temperature distribution in the melt pool during Laser Power Bed Fusion with the aim of accelerating the identification of optimal process parameters for different materials
- Utilized advanced mathematical tools such as Finite Element Analysis and Fast Fourier Transforms to numerically evaluate the model
- Preparing a journal article about the model and its advantages over existing predictive models

### Independent Mathematics Research

*Researcher*

Ithaca, NY

September 2022 – Present

- Seeking to enumerate and classify the equilibrium distributions of  $n$  mutually repulsive points confined to the surface of a sphere
- Delved into diverse and advanced mathematical fields including Graph Theory, Group Theory, and Numerical Optimization in the service of evaluating, analyzing, comparing, and visualizing distributions
- Developed an elaborate algorithm to efficiently search for all possible solutions for a given  $n$
- Meeting biweekly with a professor to collect discuss progress and setbacks, the ultimate goal being to collect the findings into a research paper
- Wrote 2500+ lines of code in MATLAB in the process of solving the problem

## LEADERSHIP EXPERIENCE

### Upper Darby Robotics and Engineering Team

*Team Lead*

Drexel Hill, PA

September 2019 – May 2022

- Designed and constructed a robot for the annual VEX Robotics Competition
- Led and rebuilt the team after COVID and virtual-learning caused all other experienced team members to leave
- Competed in the 2020 Eastern Pennsylvania State Championship Tournament

## PROFESSIONAL EXPERIENCE

### PYE Education Center

*Math Tutor*

Elmhurst, NY

June 2023 – September 2023

- Led one-on-one virtual tutoring sessions regarding Algebra 2, Geometry, and Pre-Calculus.
- Designed and reviewed SAT practice problems.

## SKILLS & INTERESTS

- **Professional skills:** Programming in MATLAB and Python; CAD in Fusion 360; Finite Element Analysis; Microsoft Office Suite; LaTeX
- **Interests:** Music Theory; Hiking; Soccer; Board Games; Political History and Philosophy; Linguistics
- **Languages:** Intermediate German; Beginner French, Arabic, Danish, Russian