Maxwell C. Heil

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EDUCATION

The Ohio State University, Columbus, OH — Expected Graduation: May 2025 (Undergrad), May 2026 (Grad)
B.S./M.S. Aerospace Engineering — Overall GPA: 3.51 (4.00 scale)

RELEVANT COURSEWORK

Statics & Mechanics of Materials | Electrical Circuits & Devices | Dynamics | Thermodynamics | Flight Vehicle Dynamics | Aerodynamics | Numerical Methods | Flight Vehicle Structures | Flight Vehicle Control | Astronautics | Gas Dynamics | Heat Transfer

ENGINEERING EXPERIENCE & PROJECTS

Private Pilot's License — August 2022 - Present

- Acquired extensive knowledge on aircraft systems and performance as well as aerodynamic capabilities of aircraft
- Explored topics such as aircraft maneuvers, aviation safety, engine systems, control theory, and aerodynamic forces
- Gained valuable hands-on experience with aircrafts and their required maintenance
- Obtained certificate in January, 2024 with plans to earn instrument and commercial ratings by the end of 2025
- Over 100 hours of Pilot In Command (PIC) flight time

Airfoil Design & Build — October - November 2022

- Researched best airfoil design to maximize stalling angle in given constraints using XFLR5 and a CFD model in Ansys
- Utilized computational results to model airfoil in SolidWorks and 3D printed design to 1/16th scale
- Achieved a final stalling angle of 17 degrees through experimental wind tunnel testing using flow visualization techniques
- Reanalyzed design to show areas of improvement and a possible increase of 2 degrees in stalling angle

Maximum Efficiency Repository Design Project — January - May 2022

- Built functioning prototype of a repository organizing device to increase productivity in the home
- Created working drawing packets for all non-standard parts in SolidWorks
- Analyzed structural components with FEM via SimulationXpress to improve durability by 10% for each prototype stage
- Fabricated design via 3D printing, laser cutting, and machining
- Conducted R&D through user feedback interviews, prototype testing, and validation plans to improve performance by 15%

Buckeye Space Launch Initiative (BSLI) — February - April 2022

- Member of the Avionics Team for Spaceport division, reporting to the Team Lead and Deputy Project Manager
- Developed circuit schematics and PCB design with Altium to use for rocket avionics
- Created all flight computers, sensors, and telemetry systems in house and ensured data collection was functioning properly
- Analyzed successes and failures of current models and worked directly with other divisions to implement new procedures

Software Design Project — August - December 2021

- Programmed a small adventure game as well as a simplified version of blackjack in MATLAB
- Operated as team manager by delegating tasks and ensuring standards were being met continuously
- Communicated issues with the program and roadblocks the team was having directly to the TA's and instructional staff
- Applied user feedback to make changes to the code and develop new ideas for future iterations

WORK EXPERIENCE

Control Systems Engineering Researcher — September, 2023 – Present
Systems, Optimization, and Autonomous Robotics Laboratory (SOAR), Dr. Debdipta Goswami — Columbus, OH

- Develop data-driven system learning and optimize on-board guidance, navigation, and control (GNC)
- Implement advanced control theory to predict hazardous trajectories and make corrective actions
- Testing Vicon motion capture technology with synchronized autonomous flight via the GitHub Crazyswarm repository
- Code embedded systems in MATLAB and Python with a Linux test bed
- Begun Project Frigatebird, an AI-powered glider using energy ("thermals") from the atmosphere to fly for long periods of time

Undergraduate Teaching Assistant – AE 2200 — August, 2023 – Present
The Ohio State University Department of Mechanical and Aerospace Engineering — Columbus, OH

- Assisted professor in teaching Introduction to Aerospace Engineering through weekly recitations with 25 students
- Organized and conducted all labs including wind tunnel testing, lighter-than-air devices, and orbital mechanics
- Applied current knowledge of material to analyze student's questions and offer a path leading to the solution
- Created weekly slides, attended staff meetings, and gave progress reports to instructional staff

Student Manager — January 2022 – Present
The Ohio State University Dining Services — Columbus, OH

- Manage over 40 employees at a time by delegating tasks to ensure proper store function and smooth operation
- Utilize soft skills to make a pleasurable experience for customers
- Ensure quality of product throughout the store by visual inspection and relayed necessary changes to staff
- Encourage employee autonomy by implementing a more hands-off approach while still maintaining accountability