Hannah Spangle
spangle.7@buckeyemail.osu.edu | 614-456-9259 | https://www.linkedin.com/in/hannah-spangle-48a199220/ | https://hannahspangle.nicepage.io/ (Portfolio)

OBJECTIVE

Engineering internship where I can apply aerospace research & work experience, student project teams experience, and strong leadership & technical communication skills.

EDUCATION

The Ohio State University | Columbus, OH 2021-2025

B.S. Aerospace Engineering with Honors, Robotics and Autonomous Systems Minor
GPA (4.0 Scale): 3.525

WORK EXPERIENCE

Research Assistant | OSU SOAR Lab, Columbus, OH January 2024 – Present

Dr. Debdipta Goswami, PI

- Designed a controlled testing environment for autonomous systems/swarm micro-UAVs to navigate urban environments, programmed flight paths for swarm patterns, and developed detect & avoid algorithms for midair collisions.
- Optimized Python code for UAV flight planning within the testing environment & improving on premade frameworks to create 8 new flight patterns using 2-4 drones at once.
- Developing UAV preflight check list to minimize damage to UAV & mitigate sources of error in experimentation, including hardware prechecks and routine for initializing the program. Improved testing success by eliminating random human errors.

Teaching Assistant | OSU College of Engineering, Columbus, OH August 2022 – December 2023

Dr. Patrick Herak, Instructor

- Assisted in teaching the fundamentals of engineering course sequences including labs, coding assignments, & engineering projects.
- Lead exam reviews for students & presented discussion / technical materials for improved exam performance.
- Wrote & presented a guide for Microsoft Suite series of presentations that will be used by the department for teaching students how to use Microsoft Suite.
- Developed interpersonal & communication skills for teaching engineering technical skills at an understandable level.

Research Assistant | OSU Aerospace Research Center Gas Turbine Lab, Columbus, OH May 2022 – January 2023

Dr. Randall Mathison, PI

- Researched the effects of blade tip rubs on jet engine performance to improve engine efficiency & service life in collaboration with Pratt & Whitney.
- Analyzed frequency and velocity test data to identify shaking problems in the blades & impact on performance.
- Assembled/tested circuit for thermal camera trigger card used in official test runs, quickly adapted to new situations.
- Optimized and improved upon code in MATLAB to calculate necessary incursion depths for blade rub shoes.

ENGINEERING PROJECTS

Cubesat Propulsion Module January 2024 – Present

- Designed a CubeSat rocket propulsion system for use in servicing space stations in partnership with Sierra Lobo.
- CAD modeled outer envelope in SolidWorks where maneuvering gas nozzles will be mounted.

Buckeye Space Launch Initiative Rocketry Team August 2021 – Present

- Designed collapsible wings and jettison system of self-rotating quadcopter HELO payload of rocket (23-24).
- Designed deployment system of camera payload of rocket (22-23)
- Tested airfoil designs for HELO with simulations in ANSYS and building prototypes for optimal lift vs reduced area.
- Tested CFD models of rocket nozzle designs for projected flight altitudes for Spaceport America Cup competition.

COSMIC Farmbot Robotic Arm January 2023 – May 2023

- Developed a 6DoF robot arm as a part of final robotics project, designed for harvesting hydroponic crops in microgravity aboard a space station.
- Assembled arm, gantry, and circuitry of arm to move on a cartesian plane across farm bed.
- Programmed robot in C++ to move between 4 quadrants of the bed with a radial distance of 1 ft to grab plants.
- Presented final PowerPoint and written report as final course deliverables, presented poster and interactive exhibit as part of the COSI science festival to engage kids in STEM.

OSU Underwater Robotics Team | Mechanical Sub Team Member August 2021 – December 2022

- Developed Kill Switch for competition robot as a safety measure when running a course.
- Designed CAD model in SolidWorks, ran material testing for magnetic field dampening, & 3D printed prototype
- Protected the robot from accidents/crashes that would majorly set back the team finance wise and time wise.

AGNES Wheeled Robot with 2DoF Arm January 2022 – April 2022

- Designed robot with omnidirectional wheels and 2DoF arm for freshman robotics course competition, worked as the Hardware Lead on team overseeing construction and maintenance of AGNES.
- CAD modeled and constructed prototypes of AGNES with user-minded design to fulfill robotics course requirements.
- Wired and programmed electronic components of AGNES, including motors for 3 omnidirectional wheels, arm with 2 servos, and photosensor.
- Edited code in C++ for course navigation utilizing local positioning system with top-down camera.
- Created mechanical drawings of all custom parts and final robot, edited final report and presentation for deliverables.

LEADERSHIP

Diamond Grove Scholars

Networking / Career Development Director May 2024 – May 2025
Media Director May 2023 – May 2024

- Diamond Grove Scholars is a student org dedicated to engaging and interacting with K-12 and college students in the space industry through career readiness, research, outreach, and entrepreneurship.
- Established and planned framework of brand-new networking and career development program, DGS Constellations, with the goal of providing our members with opportunities to network and connect with industry professionals and provide pathways into careers in the space industry.
- Managed Planet-Moon student mentorship program connecting students with shared passions for space.
- Organized Career Success Series, a group of events focusing on teaching members valuable hard and soft skills for careers in STEM and the space industry, with examples such as programming an Arduino, welding, 3D printing, job searching, and interview prep.
- Directed promotional media & oversaw media coordinators, resulted in doubling the number of members in the fall.

Buckeye Space Launch Initiative

Community Outreach Chair August 2023 – Present
Merchandise Chair October 2021 – May 2023

- Lead STEM outreach initiatives with interactive rocketry themed activities & mentorship programs to promote STEM education, retention, and early interest in the space industry, have engaged over 400 students.
- Designed merchandise and competition shirts for team; organized, ordered, & distributed over 300 items purchased.

Peer Academic Leaders Program

Peer Mentor August 2022 – May 2023

- Mentored freshman engineering students, providing advice in academics and college life success, and tutoring in introductory courses of calculus, chemistry, & physics.

SKILLS & COURSEWORK

- **Software**: ANSYS, CFD, SolidWorks, CAD, Simulink, UAS, MATLAB, C/C++, Python, VSC, ROS2, GitHub, Microsoft
- **Coursework**: Astronautics, Heat Transfer, Gas Dynamics, Aerodynamics, Structures, Controls, Dynamics, Numerical Methods, Applied Machine Learning, Electrical Circuits, Real Time Robotics, Technical Writing, Fund. UAS
    - **Labs**: CFD analysis, low-speed wind tunnel analysis, airfoil design and testing
- **Skills**: Hardware, machine shop, teamwork, public speaking, problem solving, 3D printing, drone safety certification

HONORS

- Dean's List SP22, AU22, AU23
- Aspiration for Women's Advancement & Retention in Engineering & Sciences Program September 2023 – Present
    - Mentored by Boeing mechanical engineer, learned helpful job search, career, and workplace advice.
- Sigma Gamma Tau Aerospace Engineering Honorary March 2023 – Present
- Lambda Psi Minority Engineering Honorary March 2023 – Present
- Doug Ball Aerospace Scholarship AU22 – Present
- Honors Student Program AU21 – Present