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Aranya Goyal
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EDUCATION

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| University of Pittsburgh (Swanson School of Engineering/Frederick Honors Col.) | Pittsburgh, PA |
| • <i>B.S. - Computer Engineering (Autonomous Systems Focus); GPA: 3.99/4.00</i> | <i>August 2022 - April 2026</i> |
| Courses: Data Structures and Algorithms, Embedded Processors, Microelectronics, Digital Circuits | |

PROFESSIONAL EXPERIENCE

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| Carnegie Mellon University Robotics Institute | Pittsburgh, PA |
| • <i>Undergraduate Robotist Intern</i> | <i>April 2023 - Present</i> |
- **ZOE 2 Rover:** (tinyurl.com/zoe2rover)
 - * Developing low-level software stack for the 2nd generation ZOE 2 Rover set to conduct science in the Atacama Desert including CAN protocols via the ros_canopen package for ROS2 to communicate with encoders and motors.
 - * Conducted motor and motor controller datasheet specifications validation via physical testing.
 - **Underwater Snake Robot:** (tinyurl.com/humrsCMU)
 - * Implemented High-Frequency Injection methods in Brushless DC thrusters to achieve control at low/zero speeds thus reducing minimum speed by 80% allowing for improved overall performance of the robot.
 - * Implemented station-keeping feature using AprilTags, IMU readings, and Nested PID Controllers to perform robot state-estimation underwater.
 - * Conducted major repairs on the robot and assisted in continual maintenance of the robot.
 - **Apple's E-Waste Recycling Project:** (tinyurl.com/applecmu)
 - * Created large datasets for Machine Learning Models to detect screws in e-waste images.
 - * Integrated ROS and Python packages to track AprilTags using a Realsense camera for localization of robotic arm.
 - * Manufactured custom AprilTags using lasercutters and sheet metal manufacturing methods.

STUDENT ORGANIZATIONS

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| Society of Astronautics and Rocketry | Pittsburgh, PA |
| • <i>Chief and Integration Engineer</i> | <i>August 2022 - Present</i> |
- Engineering and leading integration of a rover to participate in the University Rover Challenge. (tinyurl.com/roverimages)
 - Leading a multidisciplinary team of 30 students, coordinating between mechanical, electrical, software, and science teams.
 - Securing and managing over \$7,000 in funding for team development and future growth.
 - Proposed and led the development of a prototype robotic hand using pneumatics. (tinyurl.com/hydraarm)
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| FIRST and VEX Robotics | Exton & Royersford, PA |
| • <i>Team Captain/Design Engineer</i> | <i>August 2018 - June 2022</i> |
- Designed six robots in Solidworks across four years. All robots qualified for higher level of competition including Worlds.
 - Mentored younger students about robot design and manufacturing through workshops and general building.
 - Won the VEX Judges Award, FIRST Excellence in Engineering Award, FIRST Industrial Design Award, and the FIRST Chairman's Award. (VEX Link: bit.ly/3w7a6b1) (FIRST Link: tinyurl.com/dwbot17)

PROJECTS

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- **STM-32 Elevator Simulator (ARM Assembly, Project Integration):** Designed and Implemented software architecture in ARM Assembly to operate a physical elevator simulator PCB. (tinyurl.com/stmelevator)
 - **Custom Cane (Human Centered Design, Solidworks):** Designed and fabricated a Walker-Cane Fusion to increase bathrooms accessibility for wheelchair users. Won first place at the Senior Design Expo. (tinyurl.com/CustomCane)
 - **Formula SAE E-Brake Bias (Solidworks):** Developed an e-brake bias system for a formula style racecar, utilizing Solidworks and 3D printing technology to enhance performance and usability. Won the FSAE Innovation Award for the design and implementation of the project. (tinyurl.com/ebrakeb)
 - **Formula SAE Low-Cost Slip Angle Sensor (OpenCV, Raspberry Pi):** Worked to design and code prototypes of sensors which would allow for validation of slip angle using mouse sensors, digital cameras, and IMU's.
 - **String Art Generator and Optimizer (Research, Python):** Developed an innovative string art optimization tools and GUI using Python programming to improve upon existing string art generators. (tinyurl.com/goyalstring)

SKILLS AND AWARDS

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- **Languages:** Python, C++, ARM Assembly, RISC-V Assembly
 - **Technologies:** Linux, ROS, ROS2, Docker, Github, Solidworks, MATLAB, Microsoft Products, Microcontrollers, OpenCV
 - **Manufacturing:** Milling, Soldering, Laser Cutting, General Shop Tools
 - **Awards:** Dean's Honor List (2021-Present), Honor List (2021-Present), Eagle Scout