Marcus Wahila

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EDUCATION

University of Pittsburgh Swanson School of Engineering **Expected Graduation: May 2028**
Bachelor of Science in Mechanical Engineering

- **GPA:** 3.45
- **Relevant Coursework:** Dynamic Systems, Circuits and Systems, Mechanical Design I & II, Mechanical Measurements
- **Certificates:** Certified SOLIDWORKS Professional CSWP

EXPERIENCE

Additive Manufacturing & Rapid Prototyping **April 2019 - Present**
Independent

- Operate and maintain multiple FDM printers for prototyping functional mechanical components
- Designed and manufactured parts using engineering grade filaments such as ABS, PC, and CF reinforced Nylon
- Created comprehensive datasheet comprised of various filaments regarding optimal print settings to minimize failure

Electromechanical & Embedded Systems **June 2024 - Present**
Independent

- Designed and prototyped embedded control systems using Arduino, ESP32, ESP8266, Raspberry Pi 3, and NVIDIA Jetson Orin Nano for robotics, motor control, and computer vision applications
- Programmed hardware interfaces in C/C++ and Python using Arduino IDE and VS Code to integrate cameras, sensors, and actuators
- Designed PCBs in KiCad to optimize size and integrate micro controllers, GPIO pins, and motor drivers into a single circuit

PROJECTS

GPS Denied Autonomous Drone
Nvidia Jetson Orin Nano, ROS2, Rviz2, Ardupilot, SOLIDWORKS, Ansys, Python, OpenCV

- Modified an existing DJI Phantom 3 to carry an NVIDIA Jetson Orin Nano and IMX477 camera for absolute position error correction in a visual inertial odometry navigation system
- Simulated static loading to determine maximum displacement under worst case scenarios and designed housings and mounts based on design constraints of weight and natural frequency to create a damped load plate to obtain clear camera frames in flight
- Wrote 7 ROS nodes in python and a launch file for image processing, ORB feature detection and description, match filtering with Lowe's ratio test, RANSAC geometric verification, and position solving with a homography decomposition
- Achieved multiple in-flight position calculations accurate within 8 meters from DJI GPS as ground truth at 50-meter altitude

Automated Door Lock Series
ESP32, NEMA-17 stepper motors, gear systems, tolerance stacks, SOLIDWORKS, C, HTML/CSS

- Programmed ESP32 in C to host embedded web server to remotely control L298N motor driver and NEMA-17 stepper motor
- Designed a custom planetary gearbox delivering a 6:1 torque increase, enabling a 5 V motor to actuate a deadbolt it could not otherwise drive

Mechanical Press
SOLIDWORKS, material optimization, DFM processes, Ansys

- Designed a precision linear rail system and press to replace manual heat-set insert installation, improving repeatability of insert depth and accuracy
- Selected materials by thermal conductivity and strength, then validated the design with static structural and steady-state thermal simulations in SOLIDWORKS and Ansys
- Applied DFM principles to reduce part count and machining operations required for 3D printing

EMPLOYMENT

Carpenter, Hummel Construction **May 2026 – August 2026**

- Built and installed flooring, custom framing, and finish carpentry from construction drawings and field measurements on residential and commercial jobsites while operating power and hand tools including table and miter saws, and rotary hammers

Certified Lifeguard, Pittsburgh Citi Parks **May 2025 – August 2025**

- Held surveillance responsibility for patron safety and performed daily water chemistry testing and equipment inspections

STUDENT ORGANIZATIONS

Pitt American Society of Civil Engineers (ASCE), Deck Design Group **September 2025 – Present**

- Contributed toward development of a folding, print-in-place deck design for the 3D Printed Bridge Competition

TECHNICAL SKILLS

CAD: SOLIDWORKS, Fusion360, Inventor
Software: ROS2, Gazebo, Rviz2, Ardupilot, Arduino IDE, MATLAB, Ansys, KiCad
Hardware Platforms & Microcontrollers: Arduino, ESP, Raspberry Pi 3, Nvidia Jetson Orin nano
Languages: Python, C, C++