Sebastian Baldini

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Objective

I am a Robotics Engineering major in my first year of my masters looking for a position in robotics and embedded systems fields. I have experience in robot dynamics, computer vision, and research and development.

Education

Worcester Polytechnic Institute: Bachelor of Science in Robotics: 3.5 GPA 2025
Master of Science in Robotics 2026

Professional Experience

Drone Controls and Simulation Lead, PEAR Lab WPI August 2024- Present

- Programmed trajectories for drone interception of flying objects
- Integrated and improved on internal simulation tools for improved use of perception with drones
- Programmed with ROTS systems for drone control

Undergrad Researcher, Soft Robotics Lab WPI August 2024- Present

- Developed custom embedded sensors and encoders for soft robotic applications
- Maintained and updated lab equipment to run with new materials and with greater performence

Robotic Weapon Systems and Testing Intern, Sig Sauer May 2024 – August 2024

- Designed mechanical and electrical components for automated weapon systems
- Programmed custom computer vision tools with high-speed video with a significant increase in accuracy
- Managed and designed parts for both machining and SLS laser printing for multiple teams

Undergrad Research Assistant, Robotic Materials Group August 2023 – May 2024

- Lead undergrad researcher on novel encoding utilizing multi-material FDM printing
- Developed soft robotic quadrupedal robot to traverse while being highly resistant to physical damage
- Investigated flexible conductive filaments for future applications in sensing and robotics

Intern Production Assistant, Millenium Slate May 2022 - Aug 2022

- Operated and assisted in prototyping new industrial production lines
- Assisted in PLC debugging and FANUC robotic arm programming

Coursework

- Graduate Level Robot Dynamics
- Industrial Robotic Automation
- Computer Vision programming
- Embedded Systems Programming in C/C++
- Graduate Level Controls
- Software Development in Python and Java
- Aerial Robotics Design and Programming
- Electrical Circuitry Design and Debugging

Skills

Programming Languages: C++, C, Python, Java, Rust
Software: Solidworks, Matlab, Fusion 360, Microsoft Suite
Hardware: ABB Robotic Arms, Fanuc Robotic Arms, Raspberry Pi, Arduino, FDM 3D printers, SLS 3D Printers,

Leadership

Alpha Phi Omega: Merit Badge University Chair and Omega Head of House May 2023- December 2023

- Organized a 2-day event with over 100 Boy Scouts coming from off campus to receive Merit Badges
- Ran and managed multiple classes while assisting scouts and parents

AIAA Jet Engine Project Control System: August 2023 – Jan 2024

- Lead the development of current control box system
- Drafted additional improvements to jet engine test standing including custom 6 degree force sensing

Project Experience

Face Following Webcam December 2023 - Current

- Creating a custom solution to motorize a camera to track a user's face
- Utilizing OpenCV and Ultralytics video processing and object detection algorithms
- Implemented multithreading on a microcontroller to optimize communication and motor control

Team Lead, Intro AI Class Project: November 2023 - December 2023

- Lead my team in the development of a lecture attendance tracking software using computer vision
- Developed functional UI to intake photos and videos of lecture halls to return current attendance
- Made prototype of backend to create database to store and analyze attendance data over time

Industrial Robotics Class Project: November 2023 – December 2023

- Programmed a 6-DOF ABB arm with PLC control to manipulate and stack objects
- Utilized offline and online programming to simulate the robot before real world testing
- Learned how to optimize motion paths to avoid singularities to ensure consistent motion

ROS Robot with LiDAR Path Planning and Exploration: November 2023 – December 2023

- Programmed a robot utilizing Robot Operating System (ROS) to explore an unknown map
- Implemented the A* algorithm to explore new frontiers and unexplored regions of the field
- Utilized LiDAR sensor to create a 2D map and use it to solve the kidnapping problem

Robotic Arm Programming and CV Integration: August 2023 – October 2023

- Derived the Forwards and Inverse Kinematics for a robotic arm to gain greater control over its motion
- Programmed its motion to smoothly move objects around the workspace
- Connected the arm to a camera to detect object and move to grab and organize them

Multi-Robot Communication and Maze Navigation: March 2023 - May 2023

- Programmed three robotics to autonomously navigate a maze together
- Utilized MQTT to communicate between the three bots to complete tasks
- Used sensors to locate buttons and read QR codes with information on unknown parts of the map

Autonomous Pseudo-Solar Panel Replacement: August 2022 – October 2022

- Designed a custom gripper and 4-bar to pickup and place solar-panel like objects
- Programmed the robot to navigate and complete the task autonomously
- Assessed the maximum carry weight of the 4-bar based on gear ratios and motor power

Custom Brushless Motor Controller: January 2021 - May 2021

- Worked with classmates to research and assemble a custom brushless motor controller
- Programmed custom Arduino code to accept read interrupts to efficiently run a brushless motor
- Designed custom PCB and tested make functional model on a breadboard