**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