Sebastian Baldini

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Objective

I am a Robotics Engineering major and Computer Science Minor in my senior year of my undergraduate degree at Worcester Polytechnic Institute looking for full time positions in robotics.

Education

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

Professional Experience

Drone Controls and Simulation Lead, PEAR Lab WPI — August 2024- Present
- Programming trajectories for drone interception of flying objects
- Integrating and improving on internal simulation tools for improved use of perception with drones
- Programming with ROTS systems for drone control

Undergrad Researcher, Soft Robotics Lab WPI — August 2024- Present
- Developing custom embedded sensors and encoders for robotic applications
- Researching soft body alternatives for modern mechanical systems and sensors
- Maintaining lab equipment and assisting others in developing and manufacturing soft body components

Prototyping Lab Assistant, WPI Makerspace — August 2024-Present
- Operating and managing the 3d printers, CNC routers and laser cutters for students at WPI
- Assisting students in design and use for FDM 3d printers

Robotic Weapon Systems and Testing Intern, Sig Sauer — May 2024 – August 2024
- Worked on mechanical and electrical design for automated weapon systems
- Programmed custom computer vision tools with high-speed video for testing and evaluation
- 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
- Developing soft robotic quadrupedal robot to traverse while being highly resistant to physical damage
- Investigating flexible conductive filaments for future applications in sensing and robotics

Residential Program Assistant, WPI Frontiers Pre-Collegiate Program — June 2023 - August 2023
- Provided high school students with a college-like experience
- Assisted in the management and running of events to ensure a safe and memorable experience

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

Skills

Programming Languages: C++, C, Python, Java, Rust, MATLAB, HTML, CSS
Software: Solidworks Associate, Fusion 360, EAGLE PCB, ABB Robot Studio, Figma, Robot Operating System (ROS)
Class Experience: Computer Vision, Soft Robotics, Dynamics, Biomedical Robotics, Autonomous Ariel Robotics

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

Phi Kappa Theta: Brother and Interim Social Chair — August 2023 – Current
- Assisting in the planning and development of inter-fraternity events and assisting other positions with philanthropy event planning
- Organized a philanthropy event that raised over $1300 for charity

Organizations

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
- Designed new test stand for jet engine fuel systems and sensor array processing

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