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 and am starting my Masters at Worcester Polytechnic Institute looking for summer internships and fall Co-Ops.

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