**Sebastian Baldini**

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**Objective**

I am a Robotics Engineering major and Computer Science Minor in my junior year of my undergraduate degree at Worcester Polytechnic Institute looking for a summer internship.

**Education**

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

Master of Science in Robotics May 2026

**Professional Experience**

**Undergrad Research Assistant**, Robotic Materials Group August 2024 - Current

* Lead undergrad researcher on novel encoding utilizing multi-material FDM printing
* Working with PhD student to write research paper for soft robotic journal
* 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

**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

**Automated Photo Tagging Server Plugin** January 2024 – Current

* Developing a computer vision backend to sort and tag photo based on the contents of the photo
* Training a neural network to identify people within the photos and tag the photos for better organization
* Integrating backend with Piwigo photo server to open source for general use

**Jet Engine Project Control System:** August 2023 - Current

* Lead the development of current control box system for the AIAA Jet Engine Club
* 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

**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

**Skills**

**Programming Languages**: C++, C, Python, Java, Rust, MATLAB, HTML, CSS

**Software**: Robot Operating System (ROS), EAGLE PCB, Solidworks Associate, Fusion 360, ABB Robot Studio, Figma,

**Class Experience**: Computer Vision, Industrial Robotics, Soft Robotics, Software Development, Controls

**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 and philanthropy events
* Organized a philanthropy event that raised over $1300 for charity

**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