

# SHARWIN PATIL

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Sharwin24

SharwinPatil

sharwinpatil.info

## EDUCATION

### Northeastern University | Candidate for Bachelor of Science in Computer Engineering & Computer Science, Minor in Robotics

Expected Graduation: 05/2024

Boston, MA

- GPA: 3.66, Dean's List (all semesters)
- Relevant Courses: Object-Oriented Design, Algorithms & Data, Robotics Sensing & Navigation, Robotic Science & Systems, Computer Systems, Embedded Design: Enabling Robotics, Circuits & Signals: Biomedical Applications, Robot Dynamics & Control.
- Fundamental Courses: Software Engineering, Computer Science (II), Electronics, Digital Design & Computer Organization, Networks, Cornerstone of Engineering, Calculus (III), Differential Equations & Linear Algebra, Probability & Statistics.
- Activities: NURobotics Club Project Lead and Lead Intro Course Instructor, Club Water Polo President, First-year Engineering Tutor, Course Grader for Robot Dynamics & Control.

## EXPERIENCE

### GreenSight | UAV Robotics Engineer Co-op

06/2023 - 12/2023

Boston, MA

- Developed RTOS firmware for communications between a swarm of nano-drones and GCS over LoRa.
- Wrote firmware for a micro-controller to manage a charging station for autonomous solar lawn-mowers.
- Implemented a Hardware-Abstraction-Layer (HAL) in C for the ESP32 platform to interface with a custom LoRa chipset.

### Fulfil Solutions Inc | Robotics Software Controls Co-op

07/2022 - 12/2022

Redwood City, CA

- Developed sequencing code in C# for high-level behavior planning and task assignment for heterogeneous robotic agents.
- Composed data fetching functions to bridge C# sequencing code to MongoDB.
- Optimized AGV planning and curated heuristics for improving factory performance.
- Deployed factory-wide alerts and notifications for operators to react with relevant safety measures.

### Doble Engineering | Software Engineering Co-op

07/2021 - 12/2021

Marlborough, MA

- Developed an external data persistence mechanism in C# to be inserted into various Doble proprietary software products built with the .NET framework.
- Designed and deployed an installation wizard using Windows Presentation Foundation (WPF) for updating firmware on Doble instruments.
- Maintained software products in an Agile project management environment.

### Northeastern University | Robotic Arm Educational Kit Research

05/2022 - present

Boston, MA

- Designed and constructed a robotic manipulator as an educational tool for students to utilize for learning the kinematics and dynamics of robotic manipulators.
- Developed custom libraries in C++ for students with little coding experience to program movements, perform trajectory planning, and compute kinematics.
- Collaborated with professor Rifat Sipahi to introduce the kit to the course ME3460: Robotic Dynamics and Control.
- Applied and obtained grant money from the PEAK Experience Award committee.

## AWARDS

BSA Eagle Scout

VRC CA State Champion 2018 & 2019

VRC Awards (17x)

Varsity Water Polo MVP 2018 & 2019

PEAK Experience Summit Award 2023

## SKILLS

C#

C/C++

Arduino

Linux

Java

Python

ROS

MATLAB

SolidWorks

3D Printing

LaTeX

## PROJECTS

### AGV Motion-Planning |

09/2022 - 12/2022

NURobotics Club: VEXU Team HSKY

- Implemented an algorithm (Odometry) to compute a mobile robot's absolute position and orientation (pose) for use in autonomous navigation.
- Developed C++ code to update the robot's pose from Odometry in real-time, enabling motion-profiling.
- Designed a motion-planning algorithm to generate robot trajectories from desired pose inputs to follow using Odometry and PID controllers.

### Chess Robot |

03/2021 - 05/2022

NURobotics Club Project

- Constructed a X/Y Plotter with a modified manipulator to interact with custom chess pieces. Built with custom-designed, 3D printed parts using SolidWorks and Prusa 3D Printers.
- Implemented Arduino and Raspberry Pi components to control stepper motors, read the board state using computer vision, and display information to the user.

### Aquatic Swarm Robots |

04/2022

Atlanta, GA

RoboTech 2022 Hackathon Submission

- Created a graphical simulation in Python for a swarm of autonomous aquatic drones tasked with cleaning algal blooms within a body of water utilizing path-finding algorithms such as A\* Search and RRT.

### Image Manipulator |

06/2021

CS3500: Object-Oriented Design

- Developed a Java project to apply manipulations and enhancements to images and export them as various file types.
- Utilized the Model-View-Controller design pattern for improved extensibility and ease of modification.