SHARWIN PATIL

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EDUCATION

Northwestern University | Master of Science in Robotics

Expected Graduation: 12/2025   *Chicago, IL*

Northeastern University | B.S. in Computer Engineering & Computer Science, Minor in Robotics

Graduated: 05/2024   *Boston, MA*

SKILLS

Robotics: ROS/ROS2, Nav2, MoveIt, RViz2, Gazebo, OpenCV

Software: Embedded C, C++, Python, C#, .NET, Java, Matlab, Linux, Git, Unity, Docker, SolidWorks (CSWA)

Machine Learning: Computer Vision, PyTorch, CNNs, Reinforcement Learning (DQN, PPO)

EXPERIENCE

GreenSight | UAV Robotics Engineer Co–op

06/2023 – 12/2023   *Boston, MA*

- Developed RTOS firmware for communications between a swarm of drones and GCS over LoRa for collecting real-time weather data
- Implemented a Hardware-Abstraction-Layer (HAL) in C for the ESP32 platform to interface with a custom LoRa chipset
- Created a custom SPI driver for the ESP32 to connect to peripherals for the drone's data collection

Fulfil Solutions | 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 up to 50 heterogeneous robotic agents
- Composed data fetching functions to bridge C# sequencing code to MongoDB
- Optimized AGV planning and curated heuristics for maintaining the factory's health while improving 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# running on the .NET framework for various Doble software products
- Designed and deployed a firmware installation wizard using Windows Presentation Foundation (WPF) for Doble instruments

PROJECTS

Automated Poker Table

01/2023 – 04/2023

- Designed an automated card shuffler and dealer with stepper motors, 3D printed parts, and sensors for detecting cards
- Developed firmware for I2C and serial communications between STM32 microcontrollers and a Raspberry Pi
- Trained a Convolutional Neural Network to classify cards for game management and software shuffling
- Earned first place for Northeastern's ECE Capstone 2023

AGV Motion-Planning

09/2022 – 12/2022

- Implemented Odometry from scratch in C++ with multithreading and thread-safety to asynchronously compute the robot's absolute pose
- Designed a motion trajectory generator using Hermite splines and Bezier curves

Robot Arm Educational Kit

05/2022 – 05/2024

- Engineered a 3-link planar robotic manipulator as an educational tool for students learning the kinematics and dynamics of manipulators
- Developed custom libraries in C++ for students with little coding experience to program movements and perform trajectory planning
- Collaborated with professor Rifat Sipahi to package the robot into a kit, focusing on ease of use and curriculum compatibility

Chess Robot

03/2021 – 05/2022

- Designed a 3-axis gantry system in SolidWorks with an end-effector to grab custom chess pieces
- Integrated a computer vision model in OpenCV for identifying the game state and verified accuracy over several games

Toasting Bread with Franka Robot Arm

11/2024 – 12/2024

- Implemented a ROS2 package to interface with the MoveIt API for sending motion requests to the Franka robot arm
- Utilized an Intel Realsense camera to identify april tag markers for the robot to interact with the scene
- Collaborated within a group of students to sequence the camera and robot with the scene elements to autonomously toast bread