

ADITYA PATIL

📞 9011036943 ✉️ patiladitya1309@gmail.com 🔗 www.linkedin.com/in/aditya-patil-13207b201/ 🏠 maker-ATOM

ROBOTICS ENGINEER

Robotics Engineer specialized in designing control software for **Autonomous Mobile Robots** and **Manipulators** utilizing ROS / ROS 2 framework. My expertise lies in Sensor-Integration and Perception for Autonomous Robot and Motion Control for Manipulators.

EDUCATION

Pune Institute of Computer Technology, Pune

Aug 2020 – July 2024

Bachelor of Engineering in Electronics and Telecommunication

GPA: 9.04/10

TECHNICAL SKILLS

Languages : Python, MATLAB, C++

Technologies / Framework : ROS, ROS2, Nav2, Git, Sensor Integration, Motion Planning

Computing Environments : Linux, Raspberry Pi

Design & Manufacturing Tools : KiCAD, Fusion 360

EXPERIENCE

PICT Robotics

Apr 2021 – Aug 2023

Lead Robotics System Designer

Pune, Maharashtra, India

- Led a team of 4 to design and develop modular code-base to semi-automate ABU Robocon 2023 Robots using **ROS**.
- Introduction of **custom ROS message** to tackle unacknowledged methodology in transmitting motor parameters in ROS.
- Insertion of sync packets in serial communication between ESP32 and Raspberry Pi for synchronization.
- Utilized **sensor integration** to enable precise robot **localization**, integrating data from an Inertial Measurement Unit and Optical Mouse Sensor for accurate odometry.
- Resolved ESP32 pin count limitations by crafting a **Motor Controller HAT** using Atmega328p micro-controller, communicating via I2C protocol for each Swerve pod.
- Implemented rotary encoder-based PID control on **STM32** micro-controller to evaluate both three-wheel holonomic and four-wheel mecanum drives.

Kanan Park

Apr 2022 – Jun 2022

Electronics Engineer (Intern)

Pune, Maharashtra, India

- Designed control software, utilizing **Teensy** micro-controller as the master to interface with the RC transmitter, and employing Arduino Nano as a slave to manage PID systems for individual swerve pods.
- Established communication protocols between Arduino Nano and Teensy using MAX485 (TTL to RS485), implementing an acknowledge symbol for synchronized transmission.

PROJECTS

Optical Odometry | ROS 2, USB-Driver, Python | [GitHub](#)

Oct 2023 – Present

- Experimental project to generate precise **Odometry** data for Autonomous Mobile Robots through the utilization of Optical Flow Sensor.
- Design and development of a **ROS2 package** for odometry data including /odom topic, position reset service and odom to base_link frame broadcasting.
- Development of a **USB driver** node utilizing pyusb library to publish sensor data on respective topics.
- Conjugation of multiple sensors to achieve 3 DOF measurements, compensating for the 2 DOF limitation of optical sensors.

Hologlyph Bots (EYRC) | ROS2, Computer Vision, System Design, Python | Active Development

Sept 2023 – Present

- Implementation of a Proportional Control Driver for Autonomous Mobile Robots employing a **Finite State Machine**.
- Robot Localization through the utilization of **Aruco Markers**, along with the implementation of Fail-Safe Mechanisms for cases in which Not All Markers are detectable.
- Performance optimization using Multiple Instances of node and **Multi Threading** using ROS2 Executors.
- Introduction of **Life-Cycle management** for Nodes with states - Unconfigured, Inactive, Active and Finalized.
- Implemented sequential node launches with precise conditional checks in a structured launch file.

Decentralized Mapping and Navigation using Swarm of Robots | ROS2, Multi-Robot Control, C++

Aug 2023 – Present

- Integration of **Mapping and Navigation** capabilities into renowned swarm algorithm - Swarm Gradient Bug Algorithm (SGBA).
- Real-time Cartographic Data Generation and Propagation by the swarms through a localized mesh network.
- **Adaptive Task Assignment** via a Health State Dependent mechanism for the Robotic entities.

CERTIFICATIONS

Modern Robotics: Foundations of Robot Motion | [Link](#)

Aug 2023

Modern Robotics: Robot Kinematics | [Link](#)

Sept 2023

Python Classes and Inheritance | [Link](#)

Sept 2023

Trees and Graphs | [Link](#)

Oct 2023

Robotics: Perception | [Link](#)

Nov 2023