Jay Patel

+1 218-954-3027 |jaydp2@illinois.edu / LinkedIn / Github

Education

University of Illinois Urbana Champaign- *Master of Engineering in Autonomy and Robotics* **Aug 2023 – Dec 2024**
Courses: Computer Vision, Principal of Safe Autonomy, Mobile Robotics for CS

Ahmedabad University – *Bachelor of Technology in Mechanical Engineering* **Aug 2016 – May 2020**
Courses: Mechatronics, Robotics, Machine Vision, Learning and Application, Control System Design, Internet of Things

Projects

F1TENTH – Fully Autonomous racing car *(python, Ros2, Gazebo, Perception, Path Planning)* **Aug 2023- Present**
- Testing and developing an autonomous F1TENTH car.
- Implemented hector SLAM using Lidar to generate the environment map, which will be used for autonomous driving.
- For better control of the car, implementing MPC(Model Predictive Controller).

TERRASENSIA – VSLAM *(Computer Vision, ORB-SLAM3)* **Oct 2023- Present**
- Implementing Visual-SLAM on TERRASENSIA (agricultural robot) for localizing the robot in a cornfield.
- Using ORB-SLAM3 a feature-detection (indirect method) for mapping the environment which will be used for obstacle avoidance and mapping the world.

Simultaneous Localization and Mapping for Mobile Robotic *(C++, Ros, Gazebo)* **Jun 2023- July 2023**
- Tested Kalman filters and Monte Carlo Localization to solve the localization problem in Gazebo and Rviz.
- Deployed RTAB-Map on the simulated robot on map environment in 3D.
- Used the generated map for downstream path planning and behavior planning tasks.

Smart Toll Collection System (AI, *Computer Vision, Python, IoT, Raspberry Pi, OpenCV)* **Aug 2019- Dec 2019**
Mentor: Prof. Anurag Lakhalani Team Size - 3
- Detected the vehicle's number plate using OpenCV and a Pi camera with 97% accuracy.
- Developed a website, where toll data was stored and people could pay tolls later.
- This could save a great amount of money for the Indian people because currently, They are installing FASTag(RFID tag) in every car which costs 100-200 rupees per vehicle and the proposed system would cost very less as tolls have camera systems.

PID Automatic water level control *(MATLAB, Arduino, PID, Control System Design)* **Jan 2019-Apr, 2019**
Mentor: Dr. Harshal Oza and Ms. Jaina Mehta Team Size - 3
- The water level was measured using an ultrasonic sensor connected to Arduino. Controlled ball valve by servo motor.
- Implemented PID control in the system. We increased time response by nearly 8 seconds and accuracy by 11%.
- Build an experiment set up for the university that junior students can use for mastering PID control.

Competition

DRUSE Competition (DRDO Robotic Unmanned System Exploitation)-Ministry of Defense, India **Aug 2017 – May 2018**
- **Finalist from Western Zone** (*Python, OpenCV, 3D modeling, prototyping)* Team - 5
- Proposed idea of UAV (Unmanned Autonomous Vehicle) with two robotic arms which give primary aid to Injured soldiers in battles by blocking bleeding from cuts and gun wounds, and giving painkillers.
- Made a 3D model of the robot in SolidWorks and did terrain recognition using OpenCV.

Experience

Future Automation Solution Pvt. Ltd. **June 2020 – Jun 2023**
HVAC Engineer – Project Engineer
- Completed 7 projects on schedule, a total of 2150 TR HVAC systems.
- Secured 2 projects, a total of 650 TR HVAC systems.
- Maintained high efficiency for 925 TR of HVAC for Highly Electrical Appliance Pvt Ltd and saved $30000 in a year by root cause analysis and preventive maintenance

Skills

Language/Tools: C, C++, Python, MATLAB, ROS/ROS2, Gazebo, Simulink, SolidWorks, Fusion 360, Ansys
Technical Skills: SLAM, Path Planning, Computer Vision, Raspberry Pie, PID Control, Generative Design, HVAC Design
Soft Skills: Team Work, Leadership, Negotiations, Decision Making, Effective Communication

Online Courses

Udacity Nanodegree-Robotics Software Engineering, F1TENTH, C++, Python, Digital Manufacturing and Design, Generative Design