ADVAIT PATOLE

College Park MD | (240) 413 1795 | apatole@umd.edu | https://advaitp.github.io | https://github.com/advaitp

EDUCATION

University of Maryland College Park MEng in Robotics **August 2021-May 2023**
Relevant Courses: Intro to Robot Modelling, Control of Robotic Systems, Software Development for robotics **GPA 4.0/4.0**

Sardar Patel College of Engineering, Mumbai **June 2019**
Graduated with a Bachelor of Technology in Mechanical Engineering **CGPA 8.73/10**
Relevant Courses: Mechatronics, Industrial Robotics, Numerical Methods, CAD/CAM.

EXPERIENCE

Worley Pvt Ltd Mumbai | *Python Developer* **October 2019 – May 2021**

- Developed various python applications that involve various image processing and deep learning algorithms to reduce the manual time of engineers.

ACADEMIC PROJECTS

GAS Autonomous Collection Robot

- Developed a ROS package to fetch objects in large warehouses
- The robot autonomously searches for the object using a path planning algorithm.
- It uses a camera to detect the object and aligns itself in the direction of the object.
- The robot returns to the billing station to drop off the collected object.

Human Detection Module

- Developed a C++ module to detect humans using HOG+SVM algorithm.
- Incorporated Non-Max Suppression to remove overlapping detection boxes to achieve more accuracy in detection.

Mars Rover with robotic arm

- Developed a ROS package for mars rover with a 5DOF arm to pick and place debris on Mars.
- The Rover is equipped with a camera and lidar sensor which helps in navigation and avoid obstacles.

Robotic Arm for fruit plucking

- Developed a robotic arm to pluck fruit from trees using Raspberry Pi, Arduino, and Pi Camera.
- Programmed on Raspberry Pi3 and incorporated object detection algorithms such as YOLO, OpenCV DNN, Haar Cascade for fruit detection.
- Devised an algorithm to convert the fruit coordinates into distance from the pi camera. Employed inverse kinematics for the arm to reach the exact location of fruit.

Navigation Robot

- Incorporates Raspberry pi and pi cameras to compute a vehicle to traverse autonomously applying traffic signs.
- Implemented Hough Circle transform to get the circular signs and K-Means clustering to get the dominant color in the images to classify various traffic signs. Trained neural network to detect traffic signs for robot movements.
- Traversed the navigation robot applying four different traffic signs like right, left forward and stop sign.

Hand gesture and voice controlled electric wheelchair

- Developed a hand gesture controlled electric wheelchair using an Arduino and Adxl335 accelerometer.
- Devised a halting mechanism to stop the wheelchair in an emergency.

Snake Robot

- Developed a remote-controlled snake robot that traverses uneven fields and autonomously detects rodents.
- Executed simulation of the snake robot in V-REP software to analyze the motion of the robot.
- Treaded the snake robot in the arena in minimum possible time by avoiding the obstacles in the Eyantra Robotics Competition organized by IIT Bombay.

PDF Drawing Comparer

- Developed a web application using python to compare two different pdfs and highlight their difference in different colors.
- Programmed an algorithm to calibrate the pdfs if there is difference in their size or orientation for effective comparison.
- Designed a manual calibration mode of the drawing differentiator to differentiate a particular part of two pdfs.

TECHNICAL SKILLS

Languages: C++, Python, JavaScript, MATLAB.
Simulation Software: Gazebo, ROS, RViz, VRep, FluidSim
Designing Software: Fusion360, Catia, AutoCAD.

EXTRA CURRICULAR ACTIVITIES

- Volunteered at Child Rights and You (CRY), an NGO to teach Mathematics and English since September 2019.