

# MANAN MADAN

## Projects

### ATOM | MARS ROVER PROTOTYPE

- Led the software team efforts, reaching IRC, URC, and ERC finals.
- Re-implemented autonomous systems, cutting traversal time by 20%

### OPEN-PI BOT | DIFFERENTIAL DRIVE ROBOT IN GAZEBO

- Coded a robot simulation in Gazebo with IMU, GPS, Depth - Camera for testing purpose of algorithms before implementing on hardware.

### LANE DETECTION | LANE DETECTION USING DASH-CAM FOOTAGE

- Lane Detection using Canny Edge Detection, masking, and contour detection from the footage of the DASH-CAM of the car using OpenCV.

### PR2 | END TO END PERCEPTION PIPELINE

- Implemented Camera Calibration from scratch using OpenCV
- Implemented Voxel DownSample and pass-through filter using PCL
- Trained an SVM Classifier for object detection
- Trajectory planning using Moveit

### HANDWRITTEN DIGIT CLASSIFICATION | CLASSIFYING MNIST DATA

- Coded a regularized logistic regression to classify handwritten digits using one vs all techniques, achieved an accuracy of 94%
- Also coded a basic neural network to train on the same data and achieved an accuracy of 97%

### KINO-PLANNING | PATH PLANNING ALGORITHM

- Implemented a path planner inspired from A\*path planning algorithm, but considers robot's kinodynamic constraints while planning

### MONTE-CARLO LOCALIZATION | PROBABILISTIC LOCALIZATION

- Implemented Monte-Carlo localization from scratch
- Achieved accuracy >96%

## Work Experience

### NSIT, Delhi | Research Intern

April 2020 - July 2020

- Implemented one-hot encoding with K-Modes for clustering data
- Worked on several algorithms and tools for natural language processing and web-scraping such as chunking, chunking, regex parser, etc.

### Team ARES Robotics, Delhi | Software Lead

August 2018 - Present

- Implemented full ROS navigation stack on simulation as well as on hardware platform
- Coded an autonomous differential drive robot with various sensors such as Depth Camera, IMU, GPS, from scratch in Gazebo.

## Education

### Netaji Subash Institute of Technology, Delhi

University of Delhi  
2018-2022

### BE Instrumentation and Control

CGPA - 7.52 (Upto 3rd sem)

## Contact

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## Skills

**Languages:** C, C++, Python

**Robotics:** ROS, Gazebo, Sensor Fusion, Kalman Filters, OpenCV, Perception, Path Planning

**Frameworks:** NLTK, Spacy, Pandas, Matplotlib, Networkx, BeautifulSoup, TextBlob, Regex

## Certifications

C++ and Data Structures

> By Coding Ninjas

Competitive Programming

> By Coding Blocks

Data Structures

> By UCSD

Algorithms and Data Structures

> By UCSD

Algorithms on Graph

> By UCSD

Arduino Programming

> By Udemy

## Achievements and Awards

> Came in 10th place in Indian

Rover Championship 2019

> Qualified for European rover championship 2020

> Top 1% in JEE Advanced 2018