



# PARTH NILESH SHAH

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## Education

### Carnegie Mellon University

Master of Science in Robotic Systems Development

May 2025

Pittsburgh, PA

Selected Coursework - Adv. Computer Vision, Manipulation Estimation Control, Systems Engineering

### K. J. Somaiya College of Engineering

B. Tech in Computer Engineering — GPA - 9.06/10

May 2022

Mumbai, India

## Research Experience

### Robotics Research Center, IIIT-Hyderabad

Aug 2022 – May 2022

Research Assistant (Prof. K. Madhava Krishna)

Hyderabad, India

- Designed and developed **AutoDP : Autonomous Driving Platform** designed as full-stack software system for Sim-to-Real support of autonomous driving research.
- Implemented **Lego-LOAM** for lidar-only SLAM, **sampling-based planner** in Frenet Frame, and a **Stanley Controller** path-tracking, which are key-components for AutoDP.
- Setup **zero-shot sim-to-real transfer** from CARLA to real-car using AutoDP of NeuroSMPC, novel leaning + sampling-based optimal control algorithm.

## Work Experience

### Rightbot Technologies

Oct 2021 – July 2022

Robotics Software Engineer

Bangalore, India

- Contributed to development of **AGV fleets** for Quick-Commerce Robot-Warehouses, increasing warehouse throughput by 50%.
- Navigation Stack**: Integrated localization, planning, and control algorithms into AMRs and AGVs' software stack. Implemented safety features including speed-based active collision detection and corridor-breach detection.
- Sensor Interfacing**: Developed **ROS2 drivers** for industrial-grade sensors such as SICK Localization Camera and Hokuyo UST lidars. Created a ROS2 interface for communicating with the **CAN-bus protocol**.
- Back-end Development**: Architected a **Microservice-based** backend system for **Robotic Warehouse Management**, reducing order fulfillment times, optimizing inventory management, and streamlining robot mission scheduling.

### Xanthus Software Solutions

Jan 2021 – Mar 2021

Project Intern - Computer Vision, Blockchain

Mumbai, India

- Devised a **License Plate Recognition Pipeline** for a Drone-based Parking Management System.
- Explored DJI-Mavic SDK for live video feed transmission to a remote server for processing.
- Created a Blockchain based passive data-security mechanism for medical data records. Currently integrated with the company's dental records solution used by dentists in Germany.

## Publications

### NeuroSMPC: A Neural Network Guided Sampling Based MPC for On-Road Driving

CASE 2023

Kaustab Pal, Aditya Sharma, Mohd Omama, **Parth N Shah**, K Madhava Krishna

Paper | Website

## Projects

### Formula Student Driverless | Orion Racing India

Jan 2021 - Dec 2021

- Contributed to the development of an autonomous racing vehicle, led a 3-membered sub-team to focus on the perception stack.
- Employed **EKF-SLAM** for racetrack mapping, **Voronoi-based planner** for global planning, and **Pure-Pursuit** for path-tracking.
- Perception Pipeline**: Built RANSAC + DBSCAN based object-detection algorithm for sparse LiDAR pointclouds. Integrated YOLO for cone-detection on Kinect Cameras

### Sheet Music Player

Oct 2020 - Dec 2020

- Extensively tested various Deep-Learning model architectures for the task of Optical Music Recognition.
- Created a image-processing pipeline to clean and segment sheet-music, and passed through a CNN with Bidirectional LSTM Network for transcribing music notes.

### ABU Robocon 2019 and 2020 | Team KJSCE Robocon

Dec 2018 - Aug 2020

- Built robots for catching, placing, throwing, kicking, and a quadruped for the competition tasks
- Developed PID controller for position and velocity tracking in holonomic and synchro-drive robots on STM32F4 and Atmega2560
- Led the Embedded Team to secure 8th rank (out of 200+ teams) in Robocon 2020 competition

## Skills

**Languages**: Python, C, C++, Embedded-C, Matlab, Java

**Frameworks/Tools**: ROS-1/2, PyTorch, Tensorflow, V-Rep, Gazebo, Flask, Django, Spring, Kafka, Redis.