

# Atharva Pusalkar

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## EDUCATION

**DWARKADAS J. SANGHVI**  
**COLLEGE OF ENGINEERING**  
B.E. ELECTRONICS ENGINEERING  
May 2022 | 8.39/10.0

**SATHAYE COLLEGE**  
**HIGH SCHOOL**  
May 2018 | 86.46%

## LINKS

GitHub:// **atharva-18**  
LinkedIn:// **Atharva Pusalkar**

## DOMAINS

Autonomous Systems and Robotics.  
Self-Driving Cars. Applied Control.  
3D Perception. Path Planning.  
Software Development.  
Embedded Systems.

## COURSEWORK

Linear Control Systems  
Linear Integrated Circuits  
Microprocessors and Micro-controllers  
Engineering Electromagnetics  
Database Management Systems  
Digital Circuit Design

## SKILLS

### PROGRAMMING

C++ • C • Python • JavaScript  
8086/ARM Assembly • Matlab • Bash

### FRAMEWORKS + TOOLS

Boost • Eigen • ROS/ROS2 • PyTorch •  
TensorFlow • CUDA • OpenCV • PCL

### DESIGN SOFTWARE

• Altium Designer • SolidWorks • Cura

## AWARDS

**4th Highest Scored Worldwide**  
Cost Analysis  
Formula Student Germany 2019

**National Rank 4**  
Engineering Design  
Formula Bharat 2021

## OPEN SOURCE

Ignition Robotics (OSRF)  
Ignition RViz - PR #69 & #67

## EXPERIENCE

### DJS RACING | AUTONOMOUS SYSTEMS ENGINEER

March 2020 - Present | Mumbai, India | [Link](#)

- Worked in the Autonomous Systems and electrics division of DJS Racing, which is working for research in the field of robotics. As a part of the team, I worked on a driverless car for the Formula Student Driverless competition.
- Developed 3D obstacle detection using stereo vision and Ouster LiDAR.
- Worked on velocity estimation using multi-sensor EKF (Visual Odometry, IMU, dual GPS, and wheel speed sensors).
- Designed EKF based FastSLAM algorithm with motion compensation and loop closure detection.
- Designed sampling-based motion planning using RRT and Delaunay triangulation to generate waypoints.
- Designed PID and geometric path controllers for track mapping and global race optimization.
- Implemented Model Predictive Control to take advantage of vehicle dynamics.

### MOWITO ROBOTICS | INTERN

Jan 2021 - Present | Mumbai, India | [Link](#)

- Developed ROS workspace for pedestrian leg detection and tracking using LiDAR data and Kalman filtering with lesser false positives.

### D.J. SANGHVI COE | PROJECT INTERN

Dec 2020 - Present | Mumbai, India | [Link](#)

- Guide: Prof. Mayur Parulekar
- Working on long range(10km) collaboration, planning and data collection for drones in oceanic zones using optimal LoRa mesh communication links.
- This project is being developed in collaboration with Aerotek

### DJS RACING | SOFTWARE DESIGN AND 3D PERCEPTION ENGINEER

March 2019 - Feb 2020 | Mumbai, India | [Link](#)

- Definition of interfaces between software nodes, development of infrastructure to manage code, creating programs to improve software development experience and deciding on software conventions for the team.
- Built an interface for data acquisition and processing using the CAN protocol.
- Built vehicle dynamics model and actuator control for simulation.
- Additional experience in CAN networks, computer networking and electronics.

## PROJECTS

### MODEL PREDICTIVE CONTROL FOR RWD CARS | Nov 2020 | [Link](#)

Extension of Contouring Model Predictive Control for RWD cars with a differential, using the HPIPM NLP solver. Global race-trajectory optimization for shortest time was done using Time-Optimal Trajectory Planning (Christ et al., 2019).

### MONOCULAR DEPTH ESTIMATION USING CGANS | FEB 2020 | [Link](#)

Monocular depth estimation and object detection pipeline that uses Image-to-Image Translation with Conditional GANs (Isola et al., 2017). The model learns the translation between an RGB image and its true stereo depth.

### DATA ACQUISITION FOR A FORMULA SAE CAR | MAY 2020 | [Link](#)

Data acquisition and telemetry app for DJS Racing. It uses NodeJS as a back-end framework and EKFs for sensor fusion.