Atharva Pusalkar

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EDUCATION

DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
B.E. Electronics Engineering
May 2022 | 8.38/10.0

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 Microcontrollers
Engineering Electromagnetics
Database Management Systems
Digital Communication
Digital Circuit Design

SKILLS

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

FRAMEWORKS + TOOLS
Boost • Eigen3 • PyTorch • PyTorch C++ API • TensorFlow • Keras • CUDA • OpenCV.

ROBOTIC FRAMEWORKS
• ROS • ROS2

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

EXPERIENCE

DJS RACING | Autonomous Systems Engineer
March 2020 - Present | Mumbai, India | Report Link

- Worked in the Autonomous Systems 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 LiDARs.
- Worked on velocity estimation using multi-sensor EKFs (Visual Odometry, IMU, GPS, and wheel speed sensors).
- Designed EKF based FastSLAM algorithm with motion compensation and loop closure detection.
- Integrated a sampling-based motion planning using RRT and Delaunay triangulation.
- Designed PID and geometric path controllers for track mapping and global race optimization.
- Implemented Model Predictive Control to take advantage of vehicle dynamics.

RESEARCH & DEVELOPMENT INTERN | D.J. Sanghvi CoE
Dec 2020 – Present | Mumbai, India

- Guide: Prof. Mayur Parulekar and Prof. Prasad Joshi
- Working on long range(10km) collaboration, planning and data collection for drones in oceanic zones.
- This project is being developed in collaboration with Microchip Corporation

DJS RACING | Software Design and 3D Perception Engineer
March 2019 - Feb 2020 | Mumbai, India

- Definition of interfaces between software modules, development of infrastructure to manage code, creating tools to improve software development experience and deciding on software conventions for the team.
- Built the interface for multi-sensor data acquisition and processing.
- Built an Ackermann drive model and PID control for simulation.
- Additional experience in CAN networks, computer networking and electronics.

IEEE STUDENT BRANCH | Chairperson
Jul 2020 – Present | Mumbai, India

- Spear-headed the IEEE Student Branch of my college to organize events in the domains of Programming, Robotics, and VLSI

PROJECTS

MODEL PREDICTIVE CONTROL FOR RWD CARS | Nov 2020
Developed Model Predictive Contouring Controller 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
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
Data acquisition and telemetry app for DJS Racing. It uses NodeJS as a backend framework and quaternion EKFs for sensor fusion.