

# Atharva Pusalkar

Mumbai, India

🌐 atharva-18.github.io

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## EDUCATION

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**DJ Sanghvi College of Engineering (affiliated to University of Mumbai)**

**India**

*BE in Electronics Engineering. GPA: 8.82/10.0*

*Expected Graduation: May 2022*

## EXPERIENCE

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### Open Robotics

**Remote**

*Student Developer (Google Summer of Code)*

*May 2021 - Aug 2021*

- Worked at Open Robotics to add new features to Ignition Gazebo, funded by Google.
- Added the capability to visualize joints, inertia, and center of mass of robot models in simulation worlds.
- Developed transparent and wireframe rendering modes to debug 3D models.
- Engaged with the entire organization in weekly technical meetings to plan the project work.
- Blog post - <https://atharva-18.github.io/gsoc>

### IEEE Student Branch, DJSCE

**Mumbai, India**

*Chairperson*

*Aug 2020 - Aug 2021*

*Technical Team Member*

*Aug 2019 - Aug 2020*

- Led a team of 36 members to organize events, webinars, and workshops on the college campus.
- Implemented Agile project management for smooth operation of the committee.
- Developed the website of the committee to showcase the blogs, events, and the members of the team.
- Blog post - <https://atharva-18.github.io/ieee-sb>

### Mowito

**Bangalore, India**

*Robotics Engineer Intern*

*Jan 2021 - May 2021*

- Worked with the development team to deploy autonomous robot software in warehouse environments.
- Worked on the startup's *maxL* robot navigation stack, for smooth trajectory planning.
- Created a tool to calibrate wheel encoders for a differential-drive robot.
- Developed an automated testing system to generate synthetic 2D/3D LiDAR measurements.
- Added the capability to remotely debug deployed robots using AWS Greengrass and SSH tools.
- Blog post - <https://atharva-18.github.io/Mowito>

### DJS Racing

**Mumbai, India**

*Technical Lead - Driverless*

*May 2021 - Present*

*Design Engineer*

*Mar 2019 - April 2021*

- Spearheading a team of 20 members to develop the software for an autonomous Formula Student racecar.
- Designed the CAD model of the prototype.
- Designed a data acquisition system using the CAN protocol for automotive-grade safety.
- Developed a pipeline for 3D object detection using a LiDAR and mono camera.
- Assisted in developing a redundant state estimation algorithm.
- Integrated 2D landmark SLAM, MPC controller and sampling-based path planning.
- Blog post - <https://atharva-18.github.io/djsr>

## PROJECTS

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### ROS 2D Landmark SLAM

*Present*

- ROS 2 package for 2D landmark SLAM
- Used fastSLAM 2.0 as the back-end.
- Technologies - ROS 2, C++, and Eigen.

### Ignition Gazebo and RViz

*Dec 2020 - Mar 2021*

- Adds the ability to modify light intensity, joint controller topic validation in the Ignition Gazebo simulator.
- Implemented a new dialog box to display version number, license, and links to tutorials in the program.
- Ported features to visualize coordinate frame transforms from RViz.
- Project link - <https://atharva-18.github.io/osrf>
- Technologies - ROS 2, C++, Qt, and Ignition Math Library.

### **RRT Path Planner in C++17**

*Dec 2020*

- Rapidly-Exploring Random Trees (RRTs, LaValle et al., 1998) implementation in C++17
- Used Eigen 3 for matrix manipulation and matplotlib for visualization.
- Project link - <https://github.com/atharva-18/RRT-CPP>

### **Data Acquisition for a Formula Student Car**

*Aug 2019 - Aug 2020*

- Data acquisition system for DJS Racing.
- Designed and fabricated PCBs for data logging using the CAN protocol and STM32 MCU.
- Developed a desktop app to visualize data uploaded by the microcontroller to an AWS server.
- Thirty sensors are used to measure the pressures, wheel speeds, temperature, and IMU readings.
- Project link - <https://atharva-18.github.io/djsr-daq>

### **Monocular Depth Estimation**

*Dec 2019*

- 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.
- Project link - <https://atharva-18.github.io/cgan>

## **COURSES**

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- Digital Circuit Design, Linear Control Systems, Circuit Theory and Networks, Object-Oriented Programming, Linear Integrated Circuits, Database and Management Systems, Computer Networks.
- Coursera: Self-Driving Cars - University of Toronto, Machine Learning, Deep Learning.

## **ADDITIONAL**

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- Volunteered at National Service Scheme - DJSCE (<https://djsce.ac.in/nss>). Organized tree plantation and blood donation drives.
- Graduate Record Examinations: Verbal - 158/170, Quantitative - 166/170.
- Programming Languages: Python, C, C++, and JavaScript
- Software: SolidWorks, Fusion360, ROS/ROS2, Gazebo, LTspice, and Ultimaker Cura.
- Libraries: TensorFlow, PyTorch, NumPy, Eigen, PCL, and OpenCV.
- Languages: Marathi, English, Hindi, and Spanish.