

Pranava Swaroopa

+1 864-908-5756 | pswaroo@clemson.edu | [linkedin.com/in/pranavaswaroopa](https://www.linkedin.com/in/pranavaswaroopa) | github.com/ppswaroopa | Clemson, SC

SUMMARY

Graduate student at Clemson University's automotive engineering program at CUICAR specializing in Vehicle Autonomy. Two years of work experience as an engineering consultant and one year as a research assistant. Professional & research experience in Python, C, C++, and MATLAB. Have hands-on experience in developing and implementing deep learning algorithms.

EDUCATION

Clemson University International Center for Automotive Research <i>Masters of Science in Automotive Engineering, Specializing in Vehicle Autonomy (3.7/4.0)</i>	Greenville, SC 2021 – Present
Manipal Institute of Technology <i>Bachelors of Technology in Mechanical Engineering</i>	Manipal, India 2013 – 2017

EXPERIENCE

Graduate Research Intern <i>Adam Hoover(PI), Dept. of Electrical & Computer Engineering, Clemson University</i> <ul style="list-style-type: none">Using Computer vision collect and generate data-set for off-road autonomy.Building optimal neural network models by testing in the field.Deployed ROS with Jackal for data collection and testing.	January 2023 – Present Clemson, SC
Graduate Research Assistant <i>ARMLAB, Clemson University - International Center for Automotive Research</i> <ul style="list-style-type: none">Evaluating simulation fidelity of skid-steer robots with Project Chrono, CoppeliaSim(V-Rep), and Gazebo.Developing reinforcement learning algorithms in the context of skid-steer robots like Husky.Using ROS-MATLAB tool-chain in building autonomous mobile robots.	September 2021 – December 2022 Greenville, SC
Research Assistant <i>Agrawal Lab - Centre for Molecular Neurosciences, Kasturba Medical College</i> <ul style="list-style-type: none">Collaborated with Drosophila neuroscientists and developed 3D models for behavioral assays that simplify existing environmentsUsing 3D rapid prototyping techniques developed tools to increase the productivity of the research.Implemented machine learning models and created pipelines for fast and easy video data processing & created a data analysis software in MATLAB.Using Raspberry Pi - Arduino set up a network storage and processing device for monitoring sensor data.	July 2020 – June 2021 Manipal, India
Assistant Manager <i>Essar Projects India Ltd.</i> <ul style="list-style-type: none">Generated SOP, Safety and Construction documents for projects as the engineering consultant.Successfully collaborated with the teams across disciplines and locations across multiple projects.Selected to represent the team with clients in Kuwait.	August 2017 – June 2019 Surat, India

TECHNICAL SKILLS

Languages: C/C++, Python
Tools: Git, ROS, MATLAB, Docker, VS Code, Visual Studio, Inkscape
Simulation Environment: Gazebo/Rviz, LG-SVL, CoppeliaSim, Project Chrono
Design Software: SolidWorks, Siemens NX, AutoCAD, CATIA V5, Autodesk Fusion 360
OS: Ubuntu, Windows, Raspberry Pi

- Autonomous Navigation using Turtlebot3** | *Python, ROS, Raspberry Pi, Git, Ubuntu* Spring 2022
- Lead the team in developing the bot to navigate obstacle courses involving various tasks autonomously.
 - Developed PID controllers to use LIDAR data to keep the robot away from all obstacles and be at the center
 - Using camera images, developed a PID controller to follow a line on the track and used miniYOLO to analyze and respond to a STOP sign.
 - Implemented a cron job to get useful data sent before every test, which resulted in a faster testing schedule.
 - For successfully implementing the project, received the highest grade in the class
- Drivable Area detection in severe weather using DL** | *TensorFlow, Python, HPC, Git* Spring 2022
- Selected and processed 15.63K images from the BDD10K dataset.
 - Using Convolutional Neural Net(CNN), developed a DNN that detects drivable areas with an mIOU of 44.14%.
 - Developed a pipeline that processes a given video and outputs a video with the drivable area overlayed on it.
 - Complete project was developed using the Palmetto Cluster, an HPC environment.
- Image Segmentation with GUI** | *C, Win32, Computer Vision* Fall 2023
- Designed a GUI program on Windows using active contour algorithm draws contours.
 - Using event handlers, many different options were presented to the user.
- End-to-End Deep Learning with Object Detection** | *LG-SVL, Python, ROS, Docker, Ubuntu* Fall 2021
- Generated an End-to-End deep learning network recorded images from the front camera and steering inputs.
 - Using the LGSVL simulation environment, data collection was done by manual driving.
 - Resulting network was able to give steering commands by analyzing the front camera images.
 - This network was implemented in the Autoware-AI autonomy stack.
- Improved object detection using RADAR-Camera sensor fusion** | *Python, HPC* Spring 2022
- Processed complete nuScenes dataset for Front Camera & Radar data.
 - Network was trained with selected data for object detection.
 - Performance scores with Camera only data and RADAR data fused were compared.
- ADAS implementation on F1-10th car** | *Arduino, MATLAB* Fall 2021
- Developed PID controllers for Adaptive Cruise Control and Autonomous Lane Keeping
 - Both controllers received data from multiple ultrasonic sensors mounted on the F1-10th vehicle.
 - These were implemented on an Arduino board for real-time computing requirements.
- Model-based systems design** | *MATLAB, Simulink, AutoCAD* Fall 2021
- Designed a battery electric roadster using MATLAB Simulink models
 - Simulink models were generated for Powertrain, Tire Dynamics, and a validating Drive Cycle model.
 - These models with a regulation body was visualized to create the roadster.