Vishal Jadhav

Portfolio: vishal1711

Github: https://github.com/Vishal1711

Email: vjadhav@clemson.edu

LinkedIn: vishal-jadhav-

Mobile: +1-864-553-4965

EDUCATION

- **Clemson University – International Center for Automotive Research** Greenville, USA
  Master of Science - Automotive Engineering *August 2021 - August 2023*
- **SDGCT's Sanjay Ghodawat Group of Institution** Kolhapur, India
  Bachelor of Engineering - Mechanical Engineering *July 2014 - June 2018*

SKILLS SUMMARY

- **Languages**: C, C++, Python, MATLAB, HTML, LaTeX
- **Frameworks**: TensorFlow, PyTorch, NumPy, OpenCV, Multi-threading, CUDA, Pandas, Open3D, SQL, TensorRT
- **Tools**: Docker, Singularity, GitHub, CATIA, SolidWorks, PLM, Teamcenter, Simulink, Vim, Bash
- **Platforms**: Linux, Windows, Robot Operating System (ROS), Arduino, Raspberry Pi, Nvidia Jetson, AWS, CAN
- **DL Algorithms**: Deep Neural Network, Convolutional Neural Network (CNNs), GAN, Transformer
- **Simulator**: Gazebo, Rviz, CoppeliaSim, Foxglove

EXPERIENCE

- **ABB Inc.** San Jose, CA
  Robotics R&D Intern *Jan 2023 - Present*
  - **Nvidia Jetson**: Deploy and test the present ABB robotics item picker vision software system on Nvidia AGX Orin.
  - **Deep Learning**: Training and testing model based on transformer architecture for 3D semantic & instance segmentation on point cloud data. Creation of custom point cloud datasets using RGBD cameras. On the research end, exploration, validation, and iteration of new possible DL algorithm.

- **Vimaan Robotics** Greenville, SC
  Field Robotics Intern *Aug 2022 - Dec 2022*
  - **Localization**: Development of a localization system using the camera to track the location of a forklift inside a warehouse.
  - **ROS-Python**: In the robotics space, collaborates with a cross-functional team like firmware, hardware, computer vision & software team. Integration of new systems as well as mechanical, electrical, and system functionality tests. Firmware & software configuration on the robotic system. Monitoring field systems from development into production.
  - **Automation**: Acquisition of IMU data & images from the data and localization node. Script automation for the technical debugging network (WiFi) and camera module issues. Works with the Acroname hub tool & brings up the data and localization system.

- **Automation, Robotics, and Mechatronics Lab (ARM Lab)** CUICAR, Greenville
  Research Assistant *Oct 2021 - July 2022*
  - **Reinforcement Learning AWS**: Build AWS DeepRacer model for DeepRacer League. Create a training job to train reinforcement learning models with a reward function, optimization algorithm, environment, and hyperparameters. Evaluate a model by using SageMaker and AWS RoboMaker. Used Pure Pursuit and Stanley controller for defining reward function. Optimize the hyperparameters for competitive lap timings.
  - **ROS-MATLAB**: On physical TurtleBot 3, using MATLAB-ROS toolboxes maneuvers like track and follow objects, Simultaneous Localization and Mapping (SLAM), obstacle avoidance, and wall following. Documentation of those tasks.
  - **High-Performance Computing - Docker**: Build and deploy ROS-based docker images for a robot-like TurtleBot in a high-performance computing environment using Singularity containers for computation and simulation visualization.

- **Tata AutoComp Systems Ltd. (IPD)** Pune, India
  Associate Engineer – SQA *June 2020 – Dec 2020*
  - **Quality PPAP Performance Review**: Periodic supplier performance reviews and provide a recommendation to reevaluate supplier status. Managing the Supplier Production Part Approval (SPPAP) documents and FMEA to ensure effective and efficient review and disposition of supplier submittals.

- **Tata Technologies Ltd.** Pune, India
  Graduate Engineering Trainee (Engineering Research & Development) *Feb 2019 – Feb 2020*
  - **Passenger Vehicle CAD**: 3D CAD wiring harness routing and packaging for passenger CNG and Electric vehicles using CATIA V5- Engine WH, Cockpit WH, Console WH, Main, Battery, Doors WH. Projects: Tata Tiago CNG, Tigor EV.
  - **Electrical Schematics**: Design electrical schematics of wiring harness using Capital Harness XC. Defining electrical and electronics hardware properties. Draft Info Fitment Drawings (IFD) for the assembly production line worker.
  - **Product Lifecycle Management**: Professional Teamcenter for vehicle assembly visualization. Siemens PLM tool for design release, engineering change request, and data management.

Projects

- **Autonomous Navigation using F1/10th Vehicle** : Using cameras, MATLAB-based Autonomous Lane-keeping, Road sign detection, and speed control tasks on an F1/10th vehicle. Camera calibration to find intrinsic & extrinsic parameters. Track the lane using the first camera and recognize road signs with the second camera. PID controller for Steering and Speed control and a deep learning (R-CNN) technique for road sign detection. Established UDP communication protocol between two machines. Tech: ADAS, MATLAB, Deep Learning (CNN), Arduino, Camera (Mar 2022 - May 2022)

- **Multi-Task Learning of Deep Neural Networks in Vehicle Perception**: Real-Time Joint Semantic Segmentation and Depth Estimation Using Asymmetric Annotations. The deep learning model can simultaneously perform these two tasks on KITTI & NYUD datasets. This model has its application in autonomous vehicles and mobile robotics. Tech: PyTorch, Convolution Neural Network, Encoder-Decoder Architecture, Light-Weight RefineNet, MobileNet-v2 (April 2022 - May 2022)

- **Autonomous Maneuver using the TurtleBot 3 Burger**: ROS-based TurtleBot 3 autonomously navigates and completes tasks through the Gazebo and real-world environments using LiDAR and a camera as perception sensors. Develop and test different algorithms which use LiDAR and camera data to achieve given tasks. Hardware-software integration in TurtleBot 3. Tech: Python, Raspberry Pi, Robot Operating System (ROS), Deep Learning & OpenCV, LiDAR (Mar 2022 - April 2022)

- **Detecting anomalies in time series data from a Manufacturing System using Recurrent Neural Networks**: Build an RNN model to classify text and an LSTM model for anomaly detection (also outlier detection) on the temperature sensor data. This task predicted the possible failure of the system based on the temperature data. And this failure can be detected by checking if they follow the trend of most of the data. Tech: Tensorflow, keras, pandas (March 2022)

- **Behavioural Cloning: End to End Learning for Self-driving Cars**: The project aimed to train an end-to-end deep learning model that would let a car drive around the track in a driving simulator. Data collection, data-pre-processing, and data augmentation for training a convolutional neural network. Project-based on Nvidia end-to-end learning technique for an autonomous vehicle. Tech: Tensorflow, keras (Dec 2021)

- **Adaptive Cruise Control and Autonomous Lane-keeping with RC Vehicle**: Maintain a defined safe distance from the front vehicle with the help of an ultrasonic sensor. Kalman filter was implemented to obtain accurate distance measurements from the sensors. Steering control and electronic speed control are carried out using a PID controller. Programming microcontroller in C++ using Arduino. Tech: ADAS, C++, Kalman Filter, Ultrasonic, Arduino (Oct 2021 - Dec 2021)

- **System-Level Design of Two-seater Battery Electric Roadster**: Design powertrain subsystem using MATLAB and Simulink . Design choice and integration of six different subsystems: Structures, Packaging, Vehicle Dynamics, Powertrain, Human Factors, and System Integration. The goal was to satisfy all the requirements and ultimately maximize the profit for the organization. Tech: MATLAB, Simulink (Oct 2021 - Dec 2021)

- **Reinforcement Learning for Car-Racing Simulation in 2D Environment**: In 2D racing, simulators learn a racing controller directly from raw LiDAR observations—compared model-based versus model-free Reinforcement learning algorithm performance on different tracks. Tech: Python, stable-baselines3 (Nov 2021 - Dec 2021)

- **Sensor Fusion and Calibration**: Calibration of HC-SR04 ultrasonic sensor. Sensor fusion of ultrasonic sensors using least square approach and implement Kalman filter for converging in less than 3 sec with an accuracy of 2 mm. Tech: C++, Arduino, Kalman Filter (Oct 2021)

- **Design and Build an Electric Cart for campus purpose**: Design drivetrain for cart with a range of 100 km and a top speed of 40kmph. Manage the team of 25 members, planning and scheduling objectives for the cart, including yearly agenda and setting deadlines. Oversaw vehicle integration considering five subsystems to design a lightweight electric cart. (Jan 2018 - April 2018)

Certifications

- Machine Learning - Coursera (Stanford Online)
- AWS Machine Learning – Coursera (AWS)
- Fundamentals of Deep Learning – Nvidia DLI
- Self-Driving Car Applied Deep Learning - Udemy
- Road Dynamics Simulation Modeling – Dorle Controls LLC
- Electric and Hybrid Electric Vehicles – Devise Electronics