

Prajval Vaskar

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SUMMARY

A Self-motivated, Enthusiastic Graduate student focusing on Autonomous vehicle development with a deep understanding of the vehicle's Perception, Robotics, and Artificial Intelligence, seeking opportunities to explore career options in the Autonomous Industry.

EDUCATION

Master of Science | Automotive Engineering | Clemson University | GPA - 3.44

Aug 19-Aug 21

Bachelor of Engineering | Mechanical Engineering | Pune University | GPA - 3.85

Aug 15-May 18

TECHNICAL SKILLS

- Programing Languages – Python, ROS, C++, C, MATLAB and Simulink, LaTeX.
- Software - TensorFlow, OpenCV, ROS Autoware, Carla simulator, PyTorch, Git, Gazebo, Rviz, Arduino, Simcenter Prescan.
- Other skills – Image Processing, Artificial Intelligence, Machine Learning, Embedded Software, Network architecture.

ACADEMIC PROJECTS

Behavior Cloning using Deep Learning on f1tenth platform in the simulation environment.

Nov-Dec 20

- Developed python implementation of end-to-end learning using Nvidia's CNN model and CNN-LSTM model architecture and validated the performance in Gazebo using Robot Operating System (ROS) melodic. Tuned the hyperparameter to improve performance, such as keeping the car in the middle of the lane.

Segmentation of food images using active contouring in Visual Studio

Nov-Dec 20

- Applied the rubber band model and balloon model to shrink and expand the contours, respectively. Produced GUI to use active contour by giving initial contour points using mouse clicks to make it more interactive.

International Conference on Intelligent Robots and Systems (IROS) F1tenth competition, Las Vegas

Sep-Oct 20

- Implemented an advanced version of disparity extender by using LiDAR to change the vehicle perception and control the vehicle to follow the track, which resulted in smooth motion avoiding hitting other cars.

Turtlebot3 Simulation in Gazebo environment (ROS kinetic)

Mar-Apr 20

- Executed python implementation of Autonomous navigation of Turtlebot3 with wall following and obstacle avoidance deploying digital PID. Line following with OpenCV and stop sign recognition using darknet YOLO ROS package. Human following utilizing leg detector and digital PID for motion, led to the conclusion of autonomous working of robots in the work environment.

RRT-A* vs. RRT* In A Static Traffic Environment for Urban Driving

Mar-Apr 20

- Built simulation scenario of 8 vehicles in 3 unidirectional lanes in Tkinter and Pygame environment. Implementation of RRT-A* and RRT* and its performance comparison in python concluding RRT* is better than RRT-A*.

Autonomous Navigation on Road

Mar-Apr 20

- Accomplished autonomous lane tracking, simultaneous road sign detection, communication and vehicle control, and HMI determination by applying camera calibration, Stanley controller, UDP communication, and deep learning in MATLAB resulting in full stack autonomy.

Developed Semantic Segmentation with FCN-VGG16 on Cambridge dataset.

Mar-Apr 20

- Trained the FCN-VGG16 architecture using pre-trained weights of VGG16 with training and testing examples of 311 and 56 samples with training and validation accuracy of 88% and 85.94%, respectively.

Adaptive cruise control (ACC) and Autonomous lane-keeping (ALK) implementation on RC vehicle

Nov-Dec 19

- Programmed ACC and ALK using Arduino Uno with a model-based approach, Kalman filtering, and PID controller on an RC vehicle to achieve SAE Level 2 Autonomy.

FMAE QBDC and ISNEE QUADTORC competitions

Jan 17-Oct 18

- Design and manufacturing of an ATV. Facilitated the team and constructed steering and suspension, customized wheel assembly.
- Winner of QBDC 2017, Runner up QT 2017, Runner up QBDC 2018.

WORK EXPERIENCE

Graduate Research Assistant at Auto-AI lab – Clemson University, United States

Jan 21-July 21

- Implementation of Edge AI using edge computing platform for applications like drivable space segmentation for AV for real time application in the self-driving cars/robots. Execution of various algorithms on Amazon AWS Deep Racer using ROS framework to understand its behavior. Implementation of automated joystick control using ROS-Arduino interface for autonomous wheelchair for blind people. Simulations of different scenario on Simcenter Prescan and Autoware.ai-LGSVL to achieve autonomous planning via waypoint following.

CERTIFICATIONS

- The Complete Self-Driving Car Course - Applied Deep Learning | ROS for Beginners: Basics, Motion, and OpenCV | Visual Perception for Self-Driving Cars | Deep learning Coursera Specialization | State Estimation and Localization for Self-Driving cars | Autonomous Cars: Deep Learning and Computer Vision in Python | Learn Python Programming Masterclass| Deep Neural Networks with PyTorch.

PUBLICATIONS

- ***Design and Development of Open Differential for Transmission System of Quad Bike – IRJET.*** **Dec 18**
- ***Design and Development of Automatic Coil Winding Machine – IRJET.*** **Jun 18**
- ***Design and Development of Three-link suspension system for a Quad Bike - IRJET.*** **Jan 18**
- ***Tripod Steering for Better Maneuverability of Quad-Bike Bike - IRJET.*** **Dec17**