

Prateek Sharma

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OBJECTIVE

I am a graduate student pursuing a Master of Science in Automotive Engineering at Clemson University International Center for Automotive Research with specialization in Vehicle Autonomy. I am seeking an internship/Co-op opportunity starting Spring 2021.

EDUCATION

Master of Science (M.S) in Automotive Engineering | Clemson University, USA | GPA: 3.79/4.0 Aug 2019 – May 2021

Relevant Coursework: Motion Planning, Automotive Stability and Safety Systems, Autonomy: Science and Systems, Automotive Electronics Integration, High-Performance Computing for Vehicles, Engine Combustion and Emissions

Bachelor of Technology(B.Tech)in Mechanical Engineering | SRM University, India | Percentage : 81.22 Aug 2015 – May 2019

Relevant Coursework: Mechanics of Solid, Machines and Mechanism, Computer-Aided Manufacturing

SKILLS

Programming/ Coding Languages : C++ (Proficient), Python (Intermediate), MATLAB (Proficient), SIMULINK (Proficient)

Software Development Platforms : Linux, Windows, Arduino IDE, Raspberry Pi, OpenCR

Softwares : ROS (Intermediate), Git (Intermediate), PreScan (Basic), Siemens NX, CarSim (Basic)

Technical areas of Interest : Robotics, Motion Planning and Control, ROS, Behavior Planning, ADAS

RELEVANT PROJECT EXPERIENCE

Development of Racing Algorithms and Controller for IROS 2020 held by IEEE (Python | GitHub) Aug 2020 – Present

- Implemented and analyzed MPC, Pure Pursuit, and Stanley for fast trajectory tracking for F1/10th car
- Optimized obstacle avoidance algorithm to tackle dynamic obstacles in Real-time
- Employed racing algorithms and strategies like overtaking maneuvers

Curvature Optimization and Path Smoothing for RRT (Github | Python | Pygame | Research) May 2020 – Aug 2020

- Designed a multi-objective post-processing algorithm to smoothen the path obtained from RRT with differential constraints
- Reduced the average curvature by 90% and path length by 50% with only a 10% increase in the overhead time
- Developed a simulator in Pygame for better visualization and debugging of the RRT and post-processing codes

SIL Simulation in Gazebo for ADAS Algorithms and Behavior Planning (Github | ROS | Python |Linux) Feb 2020 – Apr 2020

- Implemented reliable ADAS algorithms on a ROS platform to maneuver a Turtlebot 3 Burger
- Integrated efficient and high-quality algorithms for different autonomous driving modules
- Increased code robustness by implementing finite-state-machine for decision making and behavior control

Analysis of Path Planning Algorithms and Local Planners (Python | C++)

Mar 2020 – Apr 2020

- Compared force and sampling-based methods like Time-to-collision, A*, Dijkstra, PRM, RRT, RRT* used for path planning
- Implemented various local planners to benchmark for RRT and RRT*, namely, Dubins curves, Reeds Shepp curves, POSQ

Advanced Rollover Warning: Computation/Estimation of (TTR) Time-to-Rollover (CarSim |Controls)

Feb 2020 – Apr 2020

- Improved model fidelity significantly by integrating the yaw-roll model with the lateral load transfer prediction model
- Performed model validation on CarSim to test critical ISO maneuvers like double-lane change, J-turn, and Fish-hook

Active Cruise Control and Autonomous Lane-keeping for Scaled F1/10th Vehicle (C/C++ |Arduino IDE)

Oct 2019 – Dec 2019

- Implemented Kalman filter and piece-wise calibration function to improve the reliability of ultrasonic sensors
- Increased robustness of the longitudinal control by using Pulse-Width-Modulation (PWM) with PID controller
- Integrated Exponential filter with a PID controller to gain a substantial improvement in lateral control

Lane Detection and Lane Following Algorithm using Machine Learning (Python |OpenCV)

Oct 2019 – Dec 2019

- Applied behavior cloning by using a data driven CNN model for lateral control
- Identified lane lines and traffic signs using OpenCV and deep learning techniques

WORK EXPERIENCE

Project Intern, CNH Industrial, Noida, India

Jan 2019 – Apr 2019

- Lead the Kaizen preparation for Kaizen convention 2019 with minimal supervision for CNH Industrials, Noida.
- Involved in readiness of AK(Advanced Kaizen) and SK(Standard Kaizen)
- The AK won the 1st position in 2019 in the whole Asia region kaizen Convention

Intern, Continental Pvt. Ltd, Meerut, India

Dec 2017 – Feb 2018

- Learned all about the logistics involved in importing the raw material, molding tires, inserting beads and treads, curing, and finally testing the tires for quality standards
- Gained knowledge regarding the equipment used for large scale production for tires components

Summer Intern, Automobile Development Internship, Ezenith Education, Ahmedabad, India

Jun 2016 – Jun 2016

- Obtained 1st position in 6 teams in a case study for a system design of a performance motorcycle
- Gained hands-on experience of disassembling and assembling 2 strokes and 4 stroke engines