Prateek Sharma

prateek-sharma.me | (864)-569-6373 | prateek@clemson.edu | linkedin.com/in/prateeks977/ | github.com/prateeks97

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, Scaled Autonomous Vehicles, Robotics Mobility and Manipulation, Analysis of Tracking Systems, Automotive Stability and Safety Systems, HPC for Vehicles Autonomy Modeling & Simulation

Bachelor of Technology in Mechanical Engineering | SRM University, India |Percentage: 81.22% **Aug 2015 – May 2019**
Relevant Coursework: Advanced Calculus, Probability and Statistics, 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 (used cvxpy as numerical optimizers), and Stanley for fast trajectory tracking for F1/10th car
- Optimized obstacle avoidance algorithm to tackle dynamic obstacles in real-time and used particle filter for pose estimation
- Employed racing algorithms and strategies like overtaking maneuvers

Curvature Optimization and Path Smoothening 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 while performing SLAM
- Integrated efficient and high-quality algorithms from sensing real-world data for different autonomous driving modules
- Increased code robustness by implementing finite-state-machine for decision making and behavior control

Analysis of Motion Planning Algorithms and Local Planners (Python |C++) **Mar 2020 – Apr 2020**
- Compared force and sampling-based motion planning algorithms like Time-to-collision, A*, Dijkstra, PRMs, RRTs, RRT*
- 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 for real time system by integrating 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

Adaptive 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 computer vision and deep learning techniques

WORK EXPERIENCE

Manufacturing Engineering Intern, CNH Industrial, Noida, India **Jan 2019 – Apr 2019**
- Lead the Kaizen preparation for Kaizen Convention 2019 that further enhanced my communication skills
- 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

Plant Engineering Intern, Continental Pvt. Ltd, Meerut, India **Dec 2017 – Jan 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 Industrial equipments used for large scale production for tires components

Automobile Development Internship (A.D.I) , Ezenith Education, Ahmedabad, India **Jun 2016 – Jun 2016**
- Obtained 1st position in 6 teams and a Certificate of Merit 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