PRUTHVI SANGHAVI

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EDUCATION

Masters of Engineering in Robotics   **Aug 2019 – May 2021**
University of Maryland, College Park, MD

Relevant Coursework: Software Development, Statistics, Algorithms, Motion Planning, Computer Vision, Robot Mapping, Network Control Systems

TECHNICAL SKILLS

Programming: Python, C++, JavaScript, C#
Software Development: Version Control, Test Driven Development, Iterative Software Development Process, Scrum
Frameworks and Libraries: ROS, MATLAB, Unity3D, TensorFlow, Keras, PyTorch, OpenCV, NumPy, Matplotlib, ReactJS
Computer Aided Design: Fusion360, Solidworks, Creo Parametric

PROFESSIONAL EXPERIENCE

Robotics Researcher (REZOOM UMD, College Park, MD)   **January 2020 – Present**
- Creating an on-device behavior planning algorithm for self-driving electric-scooters that runs on NVIDIA Jetson Nano, which performs local trajectory planning and self-parking tasks.
- Conducting a Hardware in Loop Simulation on O-Drive motor controller and Gazebo Simulator for electric-scooter self-righting mechanism feasibility study.
- Developed a self-driving electric scooter software stack and performed HIL simulations resulting in an autonomous operation in the distance range of 15 - 20 meters.

Robotics Engineering – Intern (Void Robotics, Boston, MA)   **June 2020 – August 2020**
- Designed an autonomous delivery robot in Fusion 360, equipped it with sensors, controllers and simulated the robot in ROS – Gazebo.
- Developed Intel RealSense Sensor support and automatic port identification functionality in Raspberry PI for the Navigation Software; Packaged the Software and published it on standard APT repository to ease up the installation on Linux OS.

Robotics Research – Intern (ISRO, Ahmedabad, India)   **January 2019 – May 2019**
- Researched various Machine learning techniques and trained a Neural Network with sparse geospatial dataset for image classification in TensorFlow ensuring a testing accuracy of 99%.
- Analyzed the kinematics of a bipedal planetary robot and applied zero moment point criterion to stabilize the robot motion in MATLAB.

PROJECTS

Algorithm Visualizer | ReactJS, JavaScript, CSS
- Developing an interactive ReactJS, CSS web app to visualize various sorting and graphical algorithms programmed in JavaScript.

3D Object detection on Point Cloud Data | Python, TensorFlow, Open3d, OpenCV
- Performed object detection through the implementation of Region Proposal Network (RPN) and Convolutional Neural Network (CNN) on sparse 3D point cloud dataset.
- Evaluated the architecture by experimentation on KITTI Benchmark dataset for car and pedestrian detection.

Perception for Self-Driving Vehicles | Python, OpenCV, SciPy, NumPy
- Performed Lane Line Detection through perspective transformations and image thresholding.
- Created a Visual Odometry pipeline to determine the position and orientation of a moving vehicle.

Data Annotation Tool | Python, Amazon SageMaker
- Transformed the KITTI Dataset from the local coordinate to the world coordinate System and associated the synchronized video data to Lidar data for sensor fusion.
- Prepared a SageMaker ground truth manifest file and created a 3d point cloud object detection and tracking pipeline across a sequence of frames.

TENEZBOT: A tennis ball collecting robot | C++, OpenCV, ROS, GMock, Travis CI, Coveralls
- Applied Agile Iterative Process to design and implement a tennis ball detection and collection pipeline and ensured the quality of the code using Test Driven Software Development.

PUBLICATIONS

- Derek A. Paley, **Pruthvi Sanghavi**, Naman Gupta: "Electric Scooter Self Righting Mechanism," patent disclosure filing November 2020.
- Derek A. Paley, **Pruthvi Sanghavi**, Naman Gupta: "Self-Driving Scooter," patent disclosure filing October 2020.
- **Pruthvi Sanghavi**, Chanakya Thaker, Dhruv Thanki, and Naisarg Pandya: "Air Water and Land Surveillance Bot," provisional patent filing April 2019.