Shubham Omprakash Patil

pshubham@umich.edu | +1 734-510-0903 | Portfolio

Education

University of Michigan, Ann Arbor Sept 2021 - Dec 2022
Master of Engineering in Automotive Engineering *4.0/4.0*

Relevant Coursework: Machine Learning, Self Driving Cars (controls and perception), Reinforcement Learning, Computer Vision, Mobile Robotics: SLAM and Planning

Indian Institute Of Engineering Science and Technology, Shibpur July 2017 - June 2021
Bachelor of Technology in Mechanical Engineering *8.65/10*

Relevant Coursework: Automobile Engineering, Strength of Materials

Technical Skills

- **Languages**: Python, C/C++, MATLAB
- **Libraries and Software**: OpenAi Gym, OpenCV, PyTorch, DeepMind Lab, Tensorflow, ROS, Unreal Engine, Carla, Metashape Agisoft

Work Experience

Emerging Technologies Group University of Michigan, Ann Arbor
Research and Development *December 2021 - Current*

- Performed Human-Robot Interaction simulation study using Unreal Engine, for a Military based project (ARC-Simulator).
- Developed an augmented rough terrain environment with two AV coming across 9 different types of obstacles.
- Developing 3D model (point cloud and mesh) using the Photogrammetry room at UofM.
- Value Addition (to the company): Integrating AR development with reinforcement learning models to improve the simulation experience for the user by 20%

Deepen AI Ann Arbor, Michigan
Research Cohort *January 2022 - April 2022*

- Importing 5,000 labelled Lidar point cloud scenarios in Carla for simulation
- Developed python script to simulate each point cloud instance in Carla with respect to the corresponding label (BBox and Pose).
- Generalised the script for any JSON label and point cloud data as input, to provide it's graphic simulation as output on Carla.
- Value Addition (to the company): The script enables the "labelling tool" company to present their work directly to clients in a presentable format.

Project Experience

Prioritized Experienced Replay Ann Arbor, Michigan
Course Project *August 2021 - Dec 2021*

- Implementing experienced replay algorithm on complex OpenAi Gym environments like "Space Invaders" and "Ping-Pong", achieving an accuracy of 88%.
- Deploying prioritised methodology in the previous model to improve computational efficiency by 30% and accuracy by 22% in the complex environments.

MPC and Image Classification Ann Arbor, Michigan

Developing a trajectory synthesis algorithm for a given race track, and then deploying MPC to detect and avoid randomly generated obstacles with a range of 150m in online mode.

- Developing image classification model for 22 different types of vehicles from image and Lidar point cloud data-set.