Barathwaj **Anandan**

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Education

Carnegie Mellon University — *Pittsburgh, PA*

Master of Science in Robotic Systems Development — *May 2021*

QPA: **3.92**

Coursework: Computer Vision, Machine Learning , Robot Autonomy, Robot Mobility, Estimation and Control

PSG College of Technology — *Coimbatore, India*

Bachelor of Engineering in Robotics and Automation — *June 2018*

CGPA: **8.3/10**

Coursework: Neural Networks , Vision Systems and Image Processing , Artificial Intelligence for Robotics, C++ and Data Structures

Skills

Programming C++, Python, MATLAB

Tools Pytorch, Robot Operating System (ROS), OpenCV, Git, SolidWorks, Google Sketchup

Projects

Team STORKS - Apartment Package Delivery with UAV — *September 2019 - Present*

Website (https://bit.ly/2uRnT6t)

- Currently working on a drone to deliver packages to apartment balconies autonomously.
- Implemented a Real Time Obstacle detection system based on YOLO, trained using self annotated custom dataset.

GANs for Data Augmentation with Pytorch — *December 2019*

- Developed and validated performance of a Deep Convolutional Generative Adversarial Network for Data Augmentation using Pytorch.
- Generated over 2000 Artificial training data from the Standford cars dataset.

Optical Character Recognition — *November 2019*

- Developed OCR pipeline to recognize handwritten alphabets and spatial information such as spaces and new lines.
- Implemented a CNN in Pytorch and obtained an accuracy of >90% using OCR on test images.

3D Reconstruction and Bundle Adjustment — *October 2019*

- Performed eight-point and seven-point algorithms to estimate Fundamental Matrix.
- Computed epipolar correspondences to obtain 3D Reconstruction of a given scene.
- Optimized reconstruction leveraging RANSAC and Bundle Adjustment.

Mahindra Rise Driverless Car Challenge — *July 2017 – December 2017*

- Worked on modelling and simulation of Ego vehicle utilizing ROS, Gazebo and Rviz to test sensors, communication and making system fault tolerant.

Experience

Carnegie Mellon University – Cylab — *Pittsburgh, PA*

Short Term Scholar — *Jan 2018 - May 2018, November 2018- April 2019*

- Built a robust simulator based on OGRE 3D Engine using C++, simulating different sensors, for General Motors.
- Implemented various algorithms to simulate the effects of weather conditions, traffic signals and pedestrian on Ego vehicle.
- Built an XML parser tool based on ArcGIS and OpenStreetMap to populate roads of any city into the sim for realistic environment simulation.

International Institute of Information Technology — *Hyderbad, India*

Research Intern — *June-July 2018*

- Worked on 3D modelling of Warehouse maps for testing Navigation Algorithms.
- Developed the object detection Pipeline for the autonomous warehouse cart based on TensorFlow Obstacle Detection API with ROS and Realsense D415.

Publication

Analysis of a Part Using Dynamic Simulation and Real Time Experiments in Part Feeders — *Coimbatore, India*

Journal of Mechanical and Production Engineering Research and Development (IJMPERD),Vol. 8-5, Oct 2018, 133-142. — *October 2018*