2045 Morningview Dr
Hoffman Estates, IL - 60192
https://github.com/nantha007

Nantha Kumar Sunder

(240) 579-8788
nantha07@terpmail.umd.edu
https://nantha007.github.io

EDUCATION

College Park, MD **University of Maryland** **Aug. 2018 – May 2020**

- **Major:** Robotics, M.Eng.
- **Minor:** Computer Science
- **Coursework:** Planning, Perception, Control systems, Robot Learning, Machine learning, Computer Vision.

Coimbatore, India **Amrita University** **Aug. 2011 – May 2015**

- **Major:** Electrical and Electronics Engineering, B.Tech.
- **Minor:** Embedded Systems
- **Coursework:** Control Systems, Embedded Systems, Neural Networks, Electronics, Programming C++.

WORK EXPERIENCE

Software Engineer **KPIT Technologies** **Nov. 2015 – Apr. 2018**

- Defined system requirement for Autonomous Emergency Braking based on Automotive Safety Integrity Level.
- Designed a path-planning algorithm for autonomous parallel car parking using geometric based trajectory generation.
- Developed a MATLAB program to verify and validate the data generated from the autonomous vehicle model in Simulink.
- Leveraged Knowledge in C++, MATLAB, Simulink, Carmaker, ADAS.

Computer Vision Intern **JUMPWatts** **Aug. 2020 - present**

- Researched Deep learning techniques for Sidewalk Detection and helped to improve the accuracy of the detection.
- Implemented multi-threaded program in Python to use sensors such as IMU, GPS, Camera independently.
- Leveraged Knowledge in Python, OpenCV, TensorFlow, PyTorch, Multi-Threading, I2C.

PROJECTS

Tracking in urban scenarios using C++ and OpenCV

- Implemented a C++ program to compare various keypoint detectors and descriptors available in OpenCV.
- Compared them based on speed, the number of keypoints, and keypoint matches.
- **Utilized:** C++, OpenCV, Tracking

Traffic sign recognition using SVM

- Implemented color segmentation with the help of the MSER algorithm to detect the traffic signs.
- Improved the classification of the traffic signs by 95% using negative hard mining and Support Vector Machines.
- **Utilized:** Python, OpenCV, HOG, SVM, MSER.

Monocular Depth Prediction on NYU Depth data using PyTorch

- Developed a Convolutional Neural Network based on ResNet-50 to encode the image.
- Used zero-padded Upconvolutional layers and reduced the loss by 60% in the predicted depth image.
- **Utilized:** Python, PyTorch, OpenCV, Convolutional Neural Network, ResNet-50.

Obstacle detection using PCL and LIDAR

- Implemented a C++ program to process LIDAR data from a car in Urban scenarios and detect the obstacle obstacles.
- Used RANSAC to get point clouds of obstacles like cars from the LIDAR data.
- Designed the KD-Tree algorithm to separate each obstacle by drawing a bounding box.
- **Utilized:** C++, PCL, LIDAR, RANSAC, KD-Tree.

For more projects, please visit https://nantha007.github.io.

SKILLS

- **Software:** (*proficient*): Python, C++, MATLAB (familiar): Git, C.
- **Tools/Libraries:** Robot Operating System (ROS), TensorFlow, PyTorch, CI (Travis), Keras, Git, Linux, OpenCV, PCL, Docker, CUDA, Google Cloud Platform.