5069 Berwyn Road
College Park MD 20740
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. (GPA: 3.55/4)
- **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. (GPA: 7.7/10)
- **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.
- 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.

PROJECTS

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.
- Designed the KD-Tree algorithm to separate each obstacle by drawing a bounding box.
- **Utilized:** C++, PCL, LIDAR, RANSAC, KD-Tree.

Path planning for non-holonomic robot

- Designed an 8-connected action space with differential drive constraints for the robot.
- Increased the speed of generating the path by 120% using weighted a-star for path planning.
- **Utilized:** Python, A-Star, non-holonomic, differential drive.

Frontier Exploration using ROS and Gazebo

- Used turtlebot to autonomously explore and construct the unknown map using ROS and SLAM.
- Implemented the Breadth-First Search (BFS) to reduce the time taken to completely explore the environment.
- **Utilized:** C++, ROS, Gazebo, SLAM, Google Test framework, Doxygen, Agile Methodology, BFS.

ARIAC – Agile Robotics for Industrial Automation Competition

- Implemented a C++ program to recognize parts using a low-cost laser scanner in the conveyor belt.
- Used MoveIt with RRT path planner for UR10 arm to pick the parts from the conveyor belt and place it in AGV.
- Developed smart algorithm to remove faulty parts and replace them with good parts.
- **Utilized:** ROS, C++, MoveIt!, RRT, path planning, Automation.

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

SKILLS

- **Software:** (*proficient*): Python, C++, MATLAB (familiar): Git, C.
- **Tools/Libraries:** Robot Operating System (ROS), TensorFlow, PyTorch, Numpy, Keras, Git, Linux, OpenCV, PCL.