Gowtham Ram Pagadala

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EDUCATION

Master of Science, Mechanical Engineering, Santa Clara University, Santa Clara, USA.	**Dec 2019**
Nanodegree, Robotics Software Engineer, Udacity.	**Aug 2019**
Bachelor's in Engineering, Mechanical Engineering, Anna University, Chennai, INDIA.	**May 2015**

SKILLS

Programming Language	: C++, Python, MATLAB
MicroController / Single board Computer	: Arduino, RasberryPi, Jetson TX2, Jetson Nano
Framework / Visualization Tools	: ROS, ROS 2, Simulink, Gazebo, Rviz

PROJECTS

Autonomous Tractor - ROS, C++, Python.   **Jun '19 – Dec '19**

- Developed Localization and Waypoint Navigation platform for an Autonomous Tractor project addressing the autonomous navigation problems in the field of Agricultural Robotics, to work well in the open fields as well as in the Warehouses. The Mobile Robot Platform is equipped with GPS, Lidar, Stereo Camera, IMU, and Odometry sensors.
- Developed an Algorithm with a dual onboard RTK-GPS setup for accurate heading and position estimation. Working on the implementation of cloud correction service to reduce the base station dependency.
- The Waypoint Navigation is based on the bug algorithm Path Planning Algorithm, which executes a straight path from start to goal location unless an obstacle is detected in the path by Perception Module.
- Designed a distributed system architecture using ROS over a private wireless network between two onboard processors and a base station for visualizing the robot's vision and action.

Wall Follower Hydrid Control – Arm Manipulator - C++, Python, MATLAB, and Simulink.   **May '19 – Dec '19**

- Developed an algorithm for Torque based Position Control PID Feedback for individual Actuator, which takes in position value for each actuator and develops a torque proportional to the error value based on the PID control law.
- Designed an inverse kinematic equation, which takes in the required end-effector position and calculates the individual joint angles and feeds value to the above Torque based Position Algorithm.
- A Wall Following Hybrid Control Algorithm was developed and tested on this arm manipulator.

SLAM Bot - Gazebo, ROS, Rviz, C++, Python   **July '19 - Aug '19**

- Built a mobile robot with the RGB-D sensor and Lidar, in a virtual environment, to navigate autonomously and mapping the environment with simple and efficient obstacle avoidance and path-planning algorithm (Bug Algorithm).
- Created a 2-D occupancy grid map from a laser and pose data collected by the robot odometry values, while using Adaptive Monte Carl Localization Approach to fuse the sensor value to help perform localization.

Model Predictive Control Approach for Water Tank Model - MATLAB, Simulink   **May '18 – June' 18**

- Formulated a state-space equation for the Water Tank model with unknown and varying input volume, to maintain the level within the permissible limit.
- Implemented Model Predictive Control with Kalman Filter to control the water level, not knowing the input fluid flow.

PROFESSIONAL EXPERIENCE

Robotics Engineer Intern, Infinite Options LLC. – Santa Clara, USA   **Aug '19 – Nov '19**

- Developed an Algorithm to regulate the calculation of the Encoder ticks from the wheel odometry to obtain near-perfect localization and perfect differential motion from the differential drive module.
- Developed a Kalman Filter Algorithm in C++ for the Sensor Fusion of Lidar, IMU and, encoder data to increase the efficiency and the flexibility of the system compared to the ROS utilization.

Systems Engineer, Tata Consultancy Services - Chennai, INDIA   **Jan '16 – Jan '18**

- Developed an Application for FTTP Network Planning, creating a basic plan for the equipment placement from the exchange to all the customers and display on a GIS mapping tool, increasing the efficiency of the process by 66%.
- Achieved the Perfect Quality Standards, training and managing a team of 15 people as an SME, while involved in the assessment of the project and defining the workflow and quality assessment for the incoming new projects.
- Managed the migration of critical legacy applications as a single point of contact.