Oshadha Gunasekara

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EDUCATION

CARNEGIE MELLON UNIVERSITY
Majors: B.S. Electrical and Computer Engineering, B.S. Robotics
Expected May 2020 | Pittsburgh, PA
Cum. GPA: 3.77

LINKS

Website:// **osguus.github.io**
Github:// **osguus**
LinkedIn:// **oshadhagunasekara**

COURSEWORK

Introduction to Embedded Systems
Fundamentals of Control
Robot Kinematics and Dynamics
Mobile Robotics Programming Lab
Cognitive Robotics
Introduction to Computer Systems
Structure and Design of Digital Systems
Principles of Imperative Computation

SKILLS

GENERAL

Leadership • Communication
Teamwork • Project Management
Adaptibility • Time Management
Self-Learner

PROGRAMMING

Python • C • C++ • MATLAB
Java • Javascript • Arduino
ROS • TensorFlow • OpenCV
SystemVerilog

SOFTWARE

SolidWorks • Quartus
Unity • Gazebo • Linux

TOOLS

Oscilloscope • Multimeter
Mill • 3D Printing • Lathe
Router • Laser Cutter

EXPERIENCE / PROJECTS

ATLAS PROJECT | President, Software Developer

Sep 2016 – Present | Pittsburgh, PA

- Led several undergraduate students to develop an autonomous gravity powered vehicle, known as a buggy.
- Reorganized team structure for increased productivity and planned the project timeline.
- Wrote a dead reckoning estimator in ROS to fusing IMU and encoder data.
- Utilized the dead reckoning estimator to create a map of the track utilizing gmapping.
- Developed a pure pursuit controller to allow the vehicle to steer itself on a predetermined path.
- Designed and implemented feedback controller to get an accurate steering angle from the front actuator.

GROWL LAB | Research Associate

May 2018 - August 2018 | Tucson, AZ

- Designed and wrote MATLAB/ROS interface to allow communication between TurtleBot robots and a Vicon Motion Capture system.
- Utilized the unicycle single integrator approximation to implement trajectory following for singular robots and formation control for multi-robot swarms.
- Wrote a Kalman Filter to estimate state with noisy emulated GPS measurements and a Particle Filter for a beacon homing scenario.
- Implemented and tuned a particle filter estimator

FORKLIFT MOBILE ROBOT | Software Developer

August 2017 - December 2017 | Tucson, AZ

- Collaborated with team of three students to develop an autonomous pallet-finding forklift differential drive robot.
- Wrote object-oriented MATLAB software to implement a feedforward-feedback control algorithm to precisely navigate the robot.
- Created a lookup table to plan trajectories using a cubic spiral estimation of curvature with respect to distance.
- Utilized gradient descent to minimize error of actual laser scan readings with provided map information.

PIPEDREAM | Research Associate

May 2017 – July 2017 | Pittsburgh, PA

- Worked with faculty, graduate students, and undergraduate students to build a pipe-crawling robot to map radioactive deposits for future decontamination under the leadership of Red Whittaker.
- Developed and interwove Gazebo plugins with ROS to build a robot simulation, which was used to test critical robot control and visualization algorithms.
- Created a GTK-based UI to be used as the front-end for processing recorded data.

HOME SURVEILLANCE ASSISTANT | Creator

May 2017 – July 2017 | Tucson, AZ

- Planned, designed, manufactured, and developed a differential drive robot as a side project.
- Designed the chassis and mounts in SolidWorks based on datasheet dimensions.
- Setup a local network and ROS on a Raspberry Pi 3.
- Wrote a PID controller to control wheel velocity, and integrated with wireless controller.