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

SKILLS

GENERAL

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

PROGRAMMING

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

SOFTWARE

SolidWorks • Quartus
Unity • Gazebo • Linux

TOOLS

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

EXPERIENCE

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.

NETWORKED PID CONTROLLER | Developer

November 2018 | Pittsburgh, PA

- Wrote Linux Kernel Modules for the Raspberry Pi 3 to communicate with motor encoders and motor driver.
- Implemented a simple network protocol to have two Raspberry Pi 3's to communicate with one another.
- Developed a PID controller to control position of motor, given encoder feedback.

REAL-TIME KERNEL | Developer

October 2018 | Pittsburgh, PA

- Designed and implemented a kernel using a Highest Lockers Protocol scheduler for the Raspberry Pi 3.
- Wrote software to handle re-entrant IRQs and SWIs for the Raspberry Pi's ARM-based processor.
- Developed timer IRQ interrupts to output PWM signal on a GPIO pin, controlling a a micro servo.
- Implemented mutexes on the kernel side, allowing user-mode programs to properly use them.

FPGA-BASED MASTERMIND | Developer

April 2018 | Pittsburgh, PA

- Used digital logic and finite state machines to design a mastermind game on an FPGA, using a specified scoring and payment system.
- Designed several Moore FSMs to accomplish game logic, score logic, and payment logic.
- Wrote the designed FSMs in SystemVerilog to run on the FPGA.
- Implemented digital controller for seven-segment displays.

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.