Lumbini Parnas

· Robotics Engineer ·

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"Be the change that you wish to see in the world."

Objective

Robotics Engineer seeking a full-time position starting in June 2017. Experienced in multiple programming languages, software environments and manufacturing design.

Education

Worcester Polytechnic Institute — *Massachusetts, U.S.A*

Robotics Engineering Major — *2013 - May 2017*

- Dean's List 2015-2016, GPA: 3.10

International School of Kenya — *Nairobi, Kenya*

International Baccalaureate — *2011 - 2013*

Work Experience

Indian Space Research Organization - Satellite Centre (ISAC) — *Bangalore, India*

Internship - Industrial Trainee — *June 2016 - August 2016*

- Worked in Spacecraft Mechanisms group on solar array deployment techniques.
- Analyzed regolith simulant to evaluate technical challenges involved in developing a Robotic Lunar colony.
- Trained with other engineering teams to learn about satellite development process.

Worcester Polytechnic Institute - WPI Fund — *Massachusetts, U.S.A*

Student Caller — *October 2015 - Present*

- Establishing and maintaining contact with WPI Alumni.
- Raising funds for financial aid and other on-campus resources.

Platforms and Software

Programming Languages: C/ C++, Python, Java, SQL

Programming Tools: JavaFX, Java Swing, Git, ROS, UML

Embedded Systems: Arduino, RaspberryPi, MSP430, Atmel AVR

Design Tools: Solidworks, Autodesk Inventor, AutoCAD, LabVIEW, MATLAB, Simulink, Photoshop, LaTeX

Machining: Esprit, CNC Mill, Unguarded Equipment, Laser Cutter, 3D Printer

Other Tools: Microsoft Office, Microsoft Windows, Linux, OS X

Activities and Organizations

2016 - Present **Rho Beta Epsilon - Robotics Engineering Honor Society**

2017 - Present **American Institute of Aeronautics and Astronautics (AIAA)**

2015 - 2016 **Satellite Development Club** Command and Data Handling

2014 - 2016 **Robokids** Member

Projects

MRI Compatible Fiber Optic Force Sensing
Massachusetts, U.S.A

Major Qualifying Project
2016 - Present

- Developed an optical force sensing technique using fiber optics to study the force profiles of tissue for needle guidance during a MRI biopsy.
- Designed a fixture and performed finite element analysis (FEA) to assess strain compatibility with the Fabry-Perot Interferometry sensors.
- Designed a structure to hold and align optical components and a custom PCB.

ToasterIO - Internet of Things
Massachusetts, U.S.A

Hackathon Grand Prize Winner - MLH HACK@WPI 2017
Jan 13th-15th 2017

- Modified a toaster to work with the Amazon Echo and a Raspberry Pi 3.
- Built a pulley system using recycled parts and a DC motor to autonomously pull down the knob.
- Designed a circuit board by reverse engineering the toaster to connect it to the Raspberry Pi.

2-DOF Arm Manipulation
Massachusetts, U.S.A

Unified Robotics - Manipulation
Fall 2016

- Designed and implemented a control system for a 2-DOF automated arm to pick up and weigh blocks moving on a conveyor belt.
- Included embedded programming on the AVR ATmega644P which allowed interfacing with MATLAB and peripherals.
- Used PID control, forward and inverse kinematics, infrared sensing and current sensing to efficiently perform the task.

Path Planning and Mapping
Massachusetts, U.S.A

Unified Robotics - Navigation
Spring 2016

- Used a turtlebot equipped with a Kinect and a Kobuki base to map and navigate an unknown area.
- Implemented a SLAM algorithm using A* and frontier exploration on a ROS and Python platform.

Fire Fighting Robot
Massachusetts, U.S.A

Unified Robotics - Sensing
Spring 2015

- Designed, built and programmed a robot that navigated through a maze to find and extinguish a flame.
- Used ultrasonic sensors and heat sensors to successfully navigate and detect fire.
- A combination of odometry and accelerometer was used to report the location of the robot and the fire.

Nuclear Reactor Robot
Massachusetts, U.S.A

Unified Robotics - Actuation
Spring 2015

- Designed and built a robot to change fuel rods in a platform that simulated a real-world automated nuclear plant.
- The robot autonomously navigated through the plant using a line following algorithm.
- Built a Peaucellier-Lipkin arm to manipulate fuel rods and an Ackermann steering drivetrain for mobility.

Phobos Exploration Mission Design
Massachusetts, U.S.A

Spacecraft Mission Analysis and Design
Spring 2017

- Designed a spacecraft and mission to orbit Mars and trail its largest moon, Phobos.
- Focused on the baseline design for attitude control system by evaluating the moment of inertias of the spacecraft.
- Designed a trajectory for low thrust propulsion which assisted in developing a baseline for the propulsion and power systems.

Get There - WPI Navigation Application
Massachusetts, U.S.A

Project Manager & Developer
Fall 2015

- Developed a desktop application for navigating the WPI campus in Java.
- Utilized Java Swing to implement the GUI design.
- Used Dijkstra's algorithm for path calculations.
- Heavily involved in the integration of the back-end and front-end subsystems.