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Recent Projects

RoboCup Rescue Mini 2018. - Montreal, Canada. *Team Project.*

Summer 2018
- Built a robot with the Lions Robotics Team to navigate and map a rough terrain maze with the help of a lidar. The navigation was solved using the Bellman-Ford algorithm.
- Lead the program's development. Part of the challenge was to detect movement and classify Hazmat labels using cameras; which was done using Python and OpenCV in a Raspberry Pi. The image classification algorithm involved Haar Cascades, Keypoints and Template matching. The robot had a total of 18 servo motors, 12 which integrated the swerve drive mechanism while the rest were connected in series to form a robotic claw to reach small objectives using inverse kinematics. (C++, Java, and Python).

RoboCup Rescue Maze Challenge 2018. Team Project

Spring 2018
- Built a robot with the Lions Robotics Team to autonomously navigate a random maze and localize heated and visual victims located on the walls.
- In charge of electronics (manufactured PCB designed in Eagle), mechanics (designed using Solidworks) and communication between controllers (L293D, Arduino MEGA, Arduino Nano and Raspberry Pi using OpenCV) and sensors (temperature, gyroscope, accelerometer, color, encoders, cameras, and touch display). (Python and C++).

Water Saver. (Accenture Hackathon 2nd Placwe). *Team Project.*

Winter 2017
- Developed a sensor for a house's water flux readings.
- The objective was to inform the user when water is being wasted in order to lower the water waste average in a city. In charge of the AI to recognize daily patterns and alert the user whenever these patterns are broken. (C++).

Summer 2017
Robotic Arms. Individual Project
- Built a robot of the body's upper extremities. Developed the movement controller with Microsoft Kinect V2 using Processing and SimpleOpenNI. The mathematical model and programming involved forward and inverse kinematics, and quaternions. (Java).

Work Experience

Scintia - 3D Factory MX. *Robotics Intern.*

Summer 2018
- Designed and developed electronics, mathematical models and programming for a thermocycler, a centrifuge, and an electrophoresis machine to be used at low-cost molecular biology laboratories in Mexico, Costa Rica, Argentina, Chile, Peru, and Bolivia. (Eagle, Solidworks, C++)

Microsoft - Redmond, Washington. *Software Engineer Intern.*

Summer 2019
- Developed an internal tool for cloud error logging visualization. Counting errors at blades at different racks in many different global locations. Implemented the GUI with KSQL, Typescript, Power BI and Java. The objective was to get logs of errors when hotpatching and coldpatching in order to see whether the error flux was intense, regular, or simple.

Technical Skills

Programming languages: C/C++, Java, Python, Karel, C#, VHDL, SQL, Javascript, Power BI.
Technologies: Arduino, Raspberry Pi, NodeMCU, Spartan, RoboRio.

Currently: Part of an ACM - ICPC Team
Programming a Soccer team of NAO Robots for the 2020 RoboCup to be held in Paris
Double Degree Research Program at the University of Essex in England.