Abstract:

This project is aimed at developing a versatile means of control to smart devices and physical objects. It utilizes Arduino and Raspberry Pi capabilities to leverage user customization and control. A wearable lightweight glove alongside flex sensors, accelerometer, gyroscope and Arduino Nano board are connected to log user input. The user input is consisting of hand movements or gestures that are differentiated according to the degree of bending of flex sensors and values received from the accelerometer and gyroscope. The data is later used to perform programmed actions remotely. As a proof of concept, a mini-car is used to demonstrate the remote control functionality. In addition, data from the Arduino is transmitted to a Raspberry Pi W Zero via a Bluetooth module. The Raspberry Pi displays the data for future analysis and allows for connection to multiple APIs where the gestures can perform useful actions. Possible APIs include Spotify or Movie Player APIs. The project offers versatility allowing a broad spectrum of applications to become feasible. Some of these applications include but are not limited to interpreting the American Sign Language (ASL), Wheelchair control for people with limited movement, remote control of devices or robots that undergo hazardous conditions for maintenance...etc. It is exciting to implement such a mode of control and explore the endless possibilities.