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ECE 153B
Thursday 7-10PM

ECE 153B Project Proposal: Futuristic Smart Lamp

Overview:

The goal of this project is to create a lamp that turns on when you sit in your chair and has adjustable intensity using a bluetooth connection to your phone. The activation that occurs when sitting in your chair will be implemented by a force sensor that is placed in the seat and senses when there is a change in force (either when sitting down or standing up). The light adjustment is implemented through a UART bluetooth connection to your phone that allows you to change the light intensity values wirelessly. Last but not least, we will connect an LED lamp through the USB micro-A-B port on the STM32 (We will need to use a USB type A to micro-A adapter).

Peripherals:

1. Bluetooth device - HC-05 Bluetooth Module
2. Pressure Sensor - Piezo Sensor [link](#)
3. USB Lamp (<https://amzn.to/31H6Rnz>)

Protocols:

1. USB
2. UART (Bluetooth)

Website: <http://Sites.google.com/view/futuristicsmartlamp>

Responsibility List:

Andrea will implement the pressure sensor that will be embedded in the chair seat and for interfacing the pressure sensor to the STM32 board. Mason will be responsible for developing the interface between the lamp and the STM32 board as well as any additional work that needs to be done in order to implement the distance sensor.

Software Structure:

There will be interrupts for both the pressure sensor and the bluetooth controller that controls the lamp. The pressure sensor will have higher priority over the bluetooth controller because turning the device on and off should have higher priority over adjusting the intensity of the light. The actual LED Lamp will be controlled through USB protocol and will have variable intensity that changes based on the amount of voltage we apply to it.

Block Diagram:

