Gesture Smart Lights

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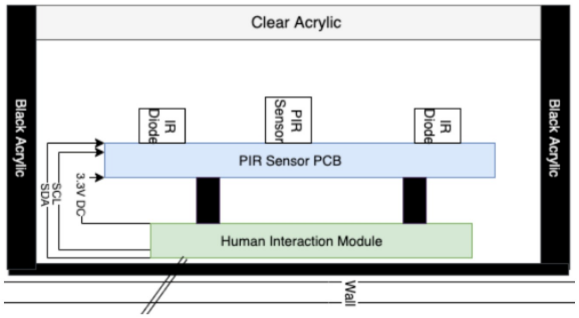
Objectives and Goals

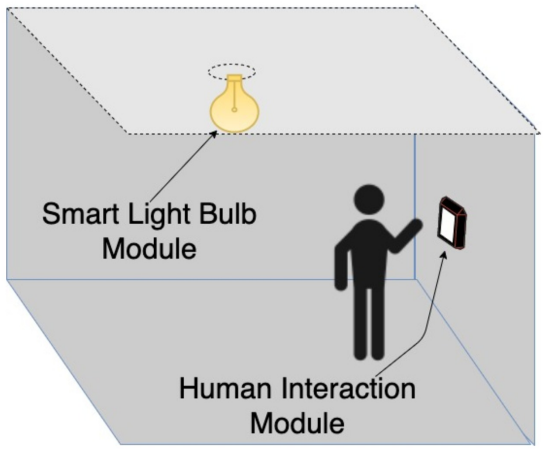
The objective is to create a more natural and healthy non-contact interface for controlling lighting environments.

- Recognize four swiping gestures in real-time
- Simple Smart light setup and integration
- Wireless connections across models
- Used low-cost IR sensor for gesture detection



How It Works

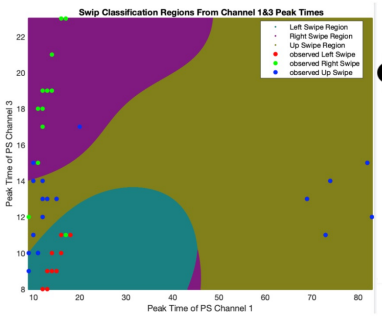
- Install the Human Interaction Module and the Smart Light
- Preform swiping gestures to control the smart light
  - Swipe up and down turn light on and off
  - Swipe right and left to change color

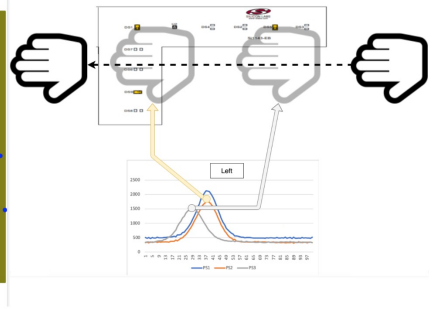


Gesture Recognition

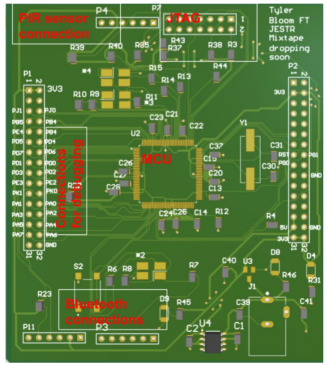
Uses Support Vector Machine to predict hand gestures in real-time and train using features calculated directly from data coming from PIR sensor.

- 3 x IR feedback Peak Occurrence Time **(Directional Information)**
- 3 x IR feedback peak width **(Speed Information)**
- 3 x IR feedback peak amplitude **(Distance Information)**



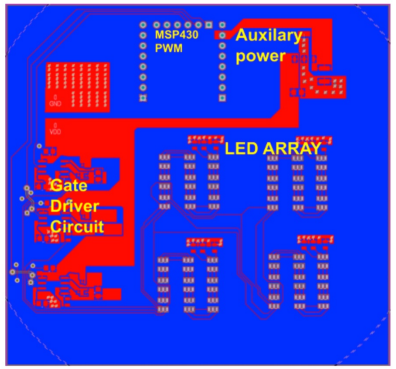


Human Interaction Module



- MCU interfaces with PIR sensor via I2c
- MCU does gesture recognition analysis of data received from PIR sensor
- Will send this data over bluetooth to MSP430 on power module to interact with lights

Smart Light

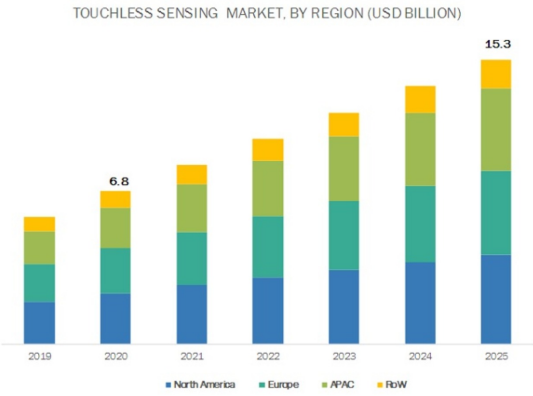


- Three (RGB) PWM control signals sent from MCU to the gate driver circuit to control the lights.
- Lighting consists 4 sets of 9 RGB LEDs hooked up in series.
- LDO used to power the MCU receiving and sending light control signals.
- Input Power is 30V which is an output of the power module
- Light commands sent to the MCU via Bluetooth from HIM Module

Results: Overall Accuracy of 96.7%

Growing Market

- Increased demand for contact-free sensing as well as hygiene issues and favorable programs deployed by the government.



Acknowlagements

Thank you to Professor Femrite, Leland Moore, Kyle Judah and all the TAs that helped us throught the last two semesters both technically and financially.