**ENGR 498**

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Group Progress Report due 9th June 2019

**Project Overview**

Our target is to build an IoT-based user programmable home automation system. Temperature, motion, and sound sensors, smoke detector, and a camera are to be controlled with multiple ESP8266-Nodemcu units and a Raspberry Pi 3B+. The data collected by the sensors is to be sent to a server (or Cloud), to become accessible for the user from anywhere in the world. The users are given the control to turn on/off their home-devices based on the readings from the sensors. The user will decide how the devices will operate based on their preferences. For example, if the temperature is more than X (degrees Celsius) turn on the AC, etc.

**Goals from last week**

* Temperature sensor and motion sensor coding.
* Localhost setup
* Cloud communication setup.
* Reading about cryptography protocols

**Accomplishments/Discoveries from last week**

* Temperature and motion sensors codes are done and tested
* We managed to send data from ESP8266-Nodemcu to the Firebase server
* We read about cryptography protocols that are used in cybersecurity.

**Current project state**

Discussion of where the project is headed and what it looks like right now. Finalizing important milestones for our project and allowing efficient progress. Sensor integration with the hardware and successful testing of the same has been completed. Cloud communication between the Nodemcu and the Firebase was setup and basic strings were transferred successfully. We are looking into the cybersecurity relating to the Firebase communication system.

**Goals for this week**

1. Sensors integration with the ESP8266:

There are 4 major sensors involved, i.e. PIR motion sensor, temperature sensor, sound sensor and the smoke sensor. Each one was integrated with the microcontroller (ESP8266 NodeMCU) individually to ensure correct working of each sensor. The code for each sensor was written and checked with the respective sensor separately. There was extensive analysis done on each sensor module and their outputs were altered to meet our requirements.

2. Local Host Setup:

Before, we begin moving towards cloud communication, we want to implement the system on a localhost (to ensure it is efficiently functioning.)

3. Cloud communication setup:

Then we will be sending the data from the sensors to the Nodemcu. From here, we will send the data into a cloud. We will test different clouds until we find the most convenient one. We may use Google Firebase, Apache Cloud, IoT Core Cloud, etc. This will involve a two-way communication between the cloud and the Nodemcu so that on-board relays (connected to the ESP8266) can be controlled via the cloud.