

CSE360 Project proposal

Group number: 5

Group members:

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Project Title: Smart Home System

1. Introduction

A smart home system is designed to make the life of the owner easier and more peaceful. In our smart home system, we incorporated intruder alarms, water level detection, water quality identification, and fire detection. They work as a unit to notify our house in case of any sort of emergency and take necessary actions.

2. Components

- ❖ Three breadboards.
- ❖ Three Arduino Uno
- ❖ Water turbidity sensor
- ❖ Water level sensor
- ❖ DC 6V micro pump motor
- ❖ PIR motion sensor
- ❖ Force sensitive sensor
- ❖ HC-05 Bluetooth module
- ❖ Flame sensor
- ❖ DHT22
- ❖ 1 channel relay
- ❖ LED lights
- ❖ Buzzer
- ❖ Switches
- ❖ Jumper wire (Male to Female)
- ❖ Jumper wire (Male to Male)

- ❖ Resistor
- ❖ LCD display

3. Project description:

❖ **Burglar Alert:**

The system uses a PIR sensor and a force-sensitive sensor. Whenever someone passes through the PIR sensor, the PIR sensor detects the heat change. Then if the switch is not turned OFF within a given time range the Bluetooth module will send an alert to the connecting device. Not only that, as the intruder appears close to the PIR sensor, it will activate an LED and buzzer alerting anyone in or outside the house of a potential burglary. PIR sensors detect human presence by detecting the change in infrared radiation across the polarity of the sensor. Now there are possibilities of a false alarm so we incorporated a switch to turn off the LED and buzzer. Furthermore, we also placed force-sensitive sensors that will also activate the LED and buzzer and send messages to the owner about a potential burglary. The force-sensitive sensor converts an input mechanical force such as load, weight, tension, compression, or pressure into another physical variable, in this case, into an electrical output signal.

❖ **Fire alarm:**

In the following system we have used a flame sensor and DHT22. If the fire breaks in, the flame sensor will detect the fire and will activate the LED light and buzzer and water will be spread at a very low speed using delay. DHT22 will also detect heat and will continuously detect heat and continue to do so until reaching a certain temperature. When a certain threshold of temperature is reached, the motor will spray out water at a low speed. The speed of the motor is controlled by the delay in our Arduino code. If the temperature reaches even higher, the speed of the motor is increased and this speed is controlled again by the delay in our Arduino code. After a given range, our microprocessor will send a notification via Bluetooth module to the owner alerting that there is a fire.

❖ **Water level and quality detector:**

In the case of water quality detection, we have used a water turbidity sensor to detect the quality of the water. We have set the threshold between 0 and 100 for pure water. So if the sensor senses a value between 0 and 100, the LCD display will show clean water. However, if the value appears above 100 then the LCD display will show dirty water. We have also incorporated a water level sensor. When our water level is low red LED will turn ON, the motor will be ON and the white LED will indicate the motor's activity. When our water level is high and a red light will be turned OFF, a white light will be turned OFF, a green light will be turned ON, and the motor will be stopped.