

# Project Third-Eye : A Home Monitoring System

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## I. INTRODUCTION

AS a result of various advancement in the world of technology, we now have people living in intelligent or smart homes that they can constantly monitor and get notifications about anything happening in and around their home even when they are not physically at home. In this project, we will be developing an Arduino based home monitoring system that focuses on the humidity and temperature in a room. The information on the current humidity and temperature are displayed using an LCD. The final prototype is expected to be capable of detecting light, motion and flame and at the same time make a sound to alert the user of these scenarios so as to take necessary action. On our final stretch, we ultimately look to have all these information saved on the cloud and transmitted to the user's mobile device through a mobile application. The idea of this project is based on the work done by [Team Gifted Media](#). [1] They used the Arduino DTH22 Humidity and Temperature Sensor to capture the temperature and humidity of a terrarium and this information is displayed on the LCD I2C 16x2 Display that they used. We will work with the knowledge from their project, adding some more new capabilities to deliver a working project.

## II. NOVEL CONTRIBUTION

The project done by the Team Gifted Media was majorly used to capture the temperature and humidity in a terrarium for the survival of a snake they owned. The system measures the temperature and humidity in the terrarium where the snakes are kept to make living comfortable for them. We are adopting this project with some new additional features. Our project will focus on the temperature and humidity but not limited to a terrarium, it will be extended to a room. We will be able to detect light, motion and flame or a temperature that is awkwardly too low or too high and alert the user of this anomaly so as to take the right decision. In addition, we hope our system can automatically communicate the data acquired to the user through a mobile application. This will make our solution more effective as the user can get information about these happenings even when they are not physically in the house.

## III. MOTIVATION

In recent times, one of the contributors to this project has a child who has constantly been complaining of cold because of the weather, his nose was constantly running and they have had to visit the hospital on three different occasions to take medication for this. They were advised to constantly dress warmly for the child and ensure he is not exposed to the cold weather. One observation they quickly made was to ensure that the temperature in their home is always set to be conducive and warm for the child. The overall temperature in their home is controlled from a central control system and they sometimes forget to change

it with the changing weather condition. They wished they had a system that could tell them when the temperature is beyond a particular threshold and help them make an informed decision. The main motivation behind this project is to create a system that can inform the user when we have a sudden or drastic change in weather conditions in the house. Another issue that motivated this project is our resolve to have the ability to detect flame and report it accordingly to the user and maybe the appropriate authority and ultimately avoid a fire incidence. The recent visit of fire department to one of our colleague's apartment building prompted us to add the flame detector capability to our solution. The fire department has had to visit this building about two times in the last month, they were responding to a fire/flame alarm triggered in the building by the installed alarm system. The occupants of the apartment can get information about flame and take necessary action as required.

## IV. ROLE OF TEAM MEMBERS

To achieve this project, we are working in a team of three individuals who will be contributing to the success of the entire project. The team members and their roles are identified below;

S/N	Name	Role
1	A K M Nazmul Hasan	Sourcing and Assembling of the Electronics Wi-Fi shield sketch programming Server side Application Mobile Application
2	Syed Tasrif Ahmed	Assembling and sketch programming for all sensors Formatting and commenting all codes
3	Tolu Fatoki	Diagrams, Schematics and Documentation

These are the specific functions for each team member. However, we are all actively involved in the various aspects of the success of this project. All the members will be collaborating with each other through google docs and GitHub.

## V. MATERIALS REQUIRED

For the success of this project we are going to be needing and using the following components;

- HC-SR04 ultrasonic distance sensor
- DHT11 temperature and humidity sensor
- Thermistor and flame detector
- 1602 LCD panel
- 10k potentiometer/ variable resistor
- ESP8266 ESP-01 Wi-Fi module
- Piezo buzzer
- Push button
- Arduino Uno board
- Bunch of resistors

- Connection wires and jumper wires
- Breadboard
- Cloud server with a domain name
- Web application to store the data
- Mobile web application

## VI. MILESTONES

We are proposing to work within the time specified in the table below. We are aware of time limitations in completing this project, but we are very hopeful that we can achieve each milestone by the specified date and ultimately have a working prototype at the end.

<b>MILESTONE 1</b>	March 11	All required Components gathered
<b>MILESTONE 2</b>	March 16	Each Component tested Individually to confirm functionality
<b>MILESTONE 3</b>	March 25	The Temperature and Humidity Sensor working with LCD
<b>MILESTONE 4</b>	March 29	The flame detector working with the system with the Capability to make a sound for an alarm
<b>MILESTONE 5</b>	April 5	Final Stretch 1- Post sensor data to the cloud
<b>MILESTONE 6</b>	April 8	Final Stretch 2- User Notification via mobile phone application

## VII. SUMMARY

We are proposing an Arduino based home monitoring system that will focus on measuring the temperature and humidity in a room and then display it on an LCD, the system will also be able to detect flame in a room in case of fire and make a sound that will alert the residents. If we can get to the final stretch of our project, the information captured by this system will be stored on the cloud and ultimately communicated to the user through the use of a mobile application. We believe that a good job done on this project can be a very useful and viable solution in various aspects of life, like in a building as we are proposing here, agriculture to monitor soil temperature and animal temperature.

## REFERENCES

- [1] Team GiftedMedia. "Arduino DTH22 Humidity Temperature With LCD I2C 16x2 Display". In: (2017). URL: [https://www.hackster.io/giftedmedia/arduino-dth22-humidity-temperature-with-lcd-i2c-16x2-display-8fe3c9?fbclid=IwAR1pbNbv14rAKp0aBYb-bg5\\_SRYxpWhU6j6xapMnl9Jv2uNEBusRPu06MF8](https://www.hackster.io/giftedmedia/arduino-dth22-humidity-temperature-with-lcd-i2c-16x2-display-8fe3c9?fbclid=IwAR1pbNbv14rAKp0aBYb-bg5_SRYxpWhU6j6xapMnl9Jv2uNEBusRPu06MF8).