Grenze International Journal of Engineering and Technology, June Issue

IoT based Weather Detecting System

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***Abstract*—The system proposed will be a project which will perform the work of weather detecting with IoT technology implemented in it. The system will be linked to a webpage to which data will be provided by the various sensors which will be used in the system for the different purposes. Then the website will analyze the data and accordingly weather conditions will be displayed on the screen along with the graphical representation of the data. Also, the data will be stored in the database for future references. Different parameters will be sensed by the device namely temperature, humidity, atmospheric pressure, sound , light intensity, carbon dioxide and monoxide levels in the air present there.**

***Index Terms*— Weather, Humidity, Temperature, Pressure, Intensity, Detecting.**

I. INTRODUCTION

This is a simple weather detecting system powered by Arduino UNO, this system detects environmental parameters such as temperature, humidity, barometric pressure, air and sound quality and light intensity as well. The device is having IoT (Internet of things) technology applied in it. Weather detection have always been a standout topic for meteorologist.

Weather conditions need to monitored on frequent and daily basis as it assumes a significant role in metereology. Weather conditions are important for many other factors like farming, deciding schedules for export of goods, flight schedules and deciding various other outdoor activities. Forecasts depends on environmental parameters like temperature, Humidity, Wind, etc. To serve this purpose one needs to study these factors.

The proposed device is having different sensors for detecting different environmental parameters namely DHT11 for temperature and humidity, BMP180 for altitude and atmospheric pressure, MQ07 and MQ135 for carbon dioxide and monoxide levels respectively, sound sensor as FC04 and LDR for light intensity. Also, the project is linked to a website which will fetch all the data from the sensors and then will accordingly analyze it and will the output as graphs of the data. Also, the data will always be stored in the database of the website for future references.

Table I. Type Sizes for Camera-Ready Papers

Methodology/Experimental

Block Diagram

Below is the block diagram of the project. The functional diagram represents the main concept of the project. The project is powered by an Arduino Uno, on which various sensors are attached. Acoustic sensors such as FC04, MQ135 for carbon monoxide, DHT11 for temperature and humidity, BMP180 for altitude and barometric pressure and MQ07 for carbon dioxide levels in the air. In addition, we will use LDR to measure light intensity.

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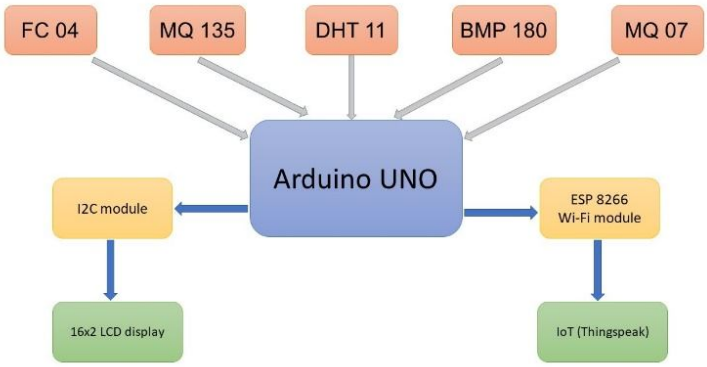


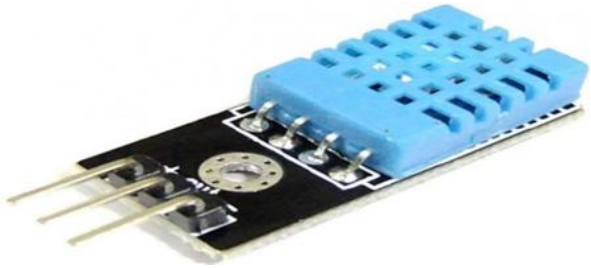
The I2C module allows multiple devices to be connected to each other using just two wires. The screen will show on the 16*2 LCD. In addition, the ESP8266 Wi-fi module is used to enable ,internet connectivity with various vehicle system applications and will provide data for subsequent jobs i.e. the website will also show the output to the user on the screen with the data graph and also store it in the database.

II. Implementation Setup

The different components used in the project are:

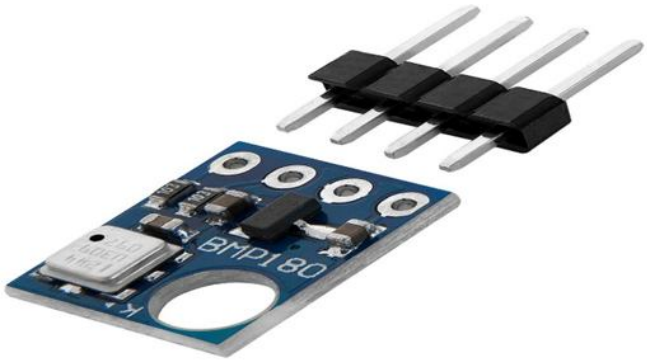
1)DHT 11

The DHT11 is a low-cost digital sensor for temperature and humidity detection. This sensor can be easily interfaced with any micro-controller like Arduino, Rasperry Pi, etc. to measure humidity and temperature instantly.



2)BMP180

BMP180 is a high-precision sensor designed for consumer applications. Air pressure is nothing but the weight of air acting on everything. Air has weight and wherever there is air its pressure will be felt. The BMP180 sensor detects this pressure and provides this information as a digital output.



3)MQ135

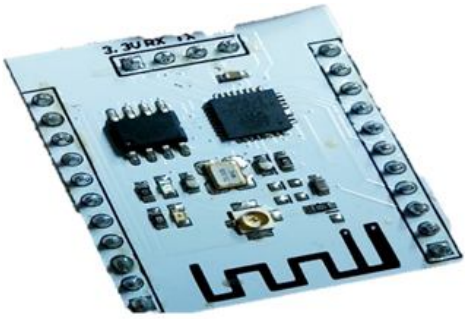
The MQ135 gas sensor is used in air quality monitoring equipment and is suitable for detecting or measuring NH3, NOx, Alcohol, Benzene, Smoke, and CO2. The MQ135 sensor module comes with a digital pin that allows this sensor to work even without a microcontroller and is very useful when you are just trying to detect a specific gas.

4)MQ07

The MQ07 gas sensor is highly sensitive to carbon monoxide. The sensor can be used to detect different gases containing CO, it is inexpensive and suitable for different applications.

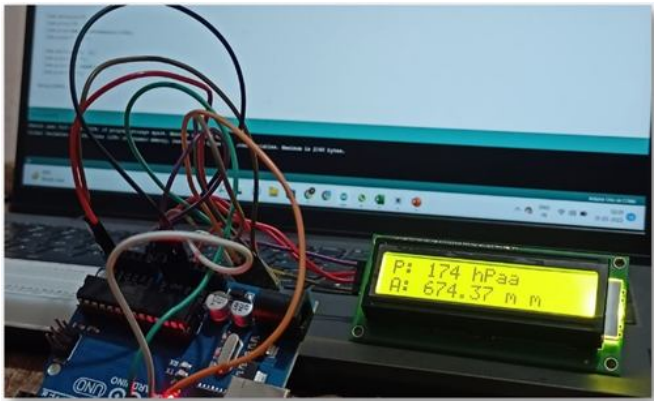
5)ESP 8266

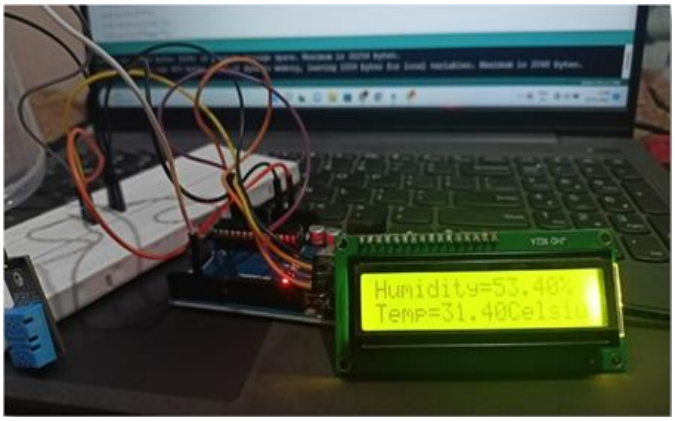
ESP8266 is a low cost WiFi module of the ESP series thst you can use to control your electronic projects anywhere in the world. It has a buily-in microcontroller and a 1MB flash that allows it to connect to WiFi networks.

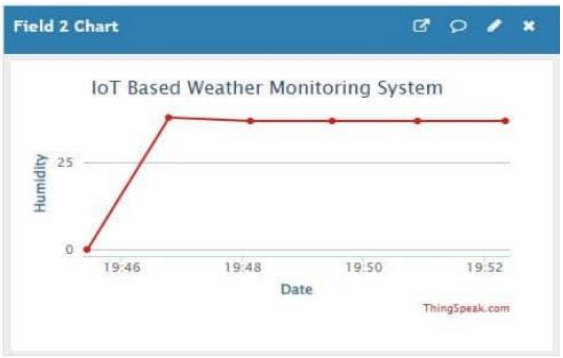


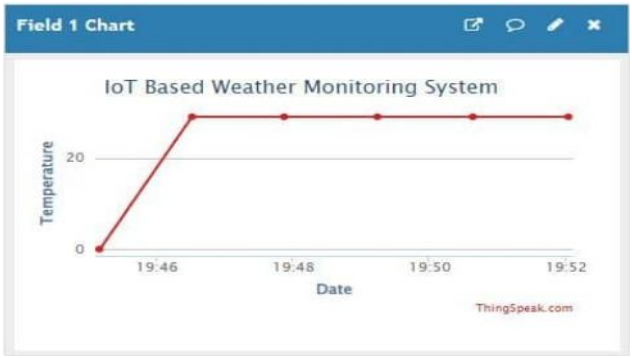
III. Results and Discussions

The result is a weather detection system that will detect the weather based on various environmental parameters like humidity, temperature, barometric pressure, sound and light, etc. The system will be linked to a device via IoT, which will provide the graphical result of the forecast and will be stored in the database.









IV. Future Scope

This system is very useful for farmers where they can ensure high crop yield and reduce the risk caused by weather through IoT. In particular, it is useful when drastic changes in the environment take place. In the future, we may also add different types of sensors such as earthquake detection sensor, light sensor, rain level sensors. We may also add machine learning and artificial intelligence algorithms to predict future weather and its effect on the environment

V. Conclusion

This system is used to detect environmental parameters such as temperature, humidity, pressure, air quality, etc. Sensors in the data collection environment. By implementing sensors in the system, we can bring the environment to life. The results of the collected data are then displayed on the screen via Wi-Fi. We can use this device to monitor a specific room or place where environmental parameters need to be monitored. Accuracy of this exact model with real data. The main purpose if this device is to make the system beneficial and useful.

Acknowledgment

"DESH VIT, Pune", "Principal VIT, Pune", "HOD, DESH" sincerely thank you for giving us valuable advice and suggestions in this project. "P.P Musale" would like to thank you for your valuable advice, enthusiastic attitude and support throughout our project. We are fortunate to work under your leadership.

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