

# IoT based Climate Monitoring System using Arduino

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**Abstract:** *The Internet of Things (IOT) defines the interconnection of devices & people through the traditional internet & social networks for various day-to-day applications like climate monitoring, Healthcare systems, smart cities, irrigation fields & smart lifestyles. The climate monitoring system plays important role in our daily life So, in this paper, we present an automatic climate monitoring system that permits having real-time climate data of a particular place. The advanced system uses ESP 8266 module & which is implemented on the Arduino platform and is used to recover the data from the cloud. The main purpose of this system is to sense the climate parameters, like temperature humidity, rain & survival of some gases based on the sensors & sends the information to the Thing speak server & then plot the sensor data as graphical statistics. Updated data from the implemented system can access the internet from anywhere in the world.*

**Keywords:** Internet of Things (IOT); Embedded computing system; Arduino software, ESP8266, Smart Environment

## I. INTRODUCTION

Climate forecasting is a prediction of what the climate will be like shortly. In the online world, climate prediction is essential for several reasons like it saves lives & it helps when things like natural tragedies occur such as floods trauma does hurricanes etc. Climate forecasting can predict when those natural tragedies are imminent. The more messages people have better they can prepare for the upcoming tragedy the climate can impact our mainboard, if we didn't know more about the climate at right time, e would be in serious trouble. It can affect sports, outside activities, farming, navigation, and transportation. The climate is important to farmers also to plant the seeds in the right type of climate. From the seedlings to taking the grains home formers need to observe the climatic conditions throughout. Well actually predicting climate is majorly important for sailors, pilots & the people who are in business transportation.

## II. LITERATURE RIVIEW

### ESP 8266 Node MCU based Weather Monitoring System

In the paper the author developed a system that includes HVAC system Node MCU, yearly, transformer to weather condition software used Net PI platform the parameters are Temperature, Humidity wind only.

### IOT based Weather Monitoring System

In this paper, the author developed a system in which the main part is or mainboard is Node MCU 1.0 And only here are parameters are checked Humidity, Temperature, pressure software used HTML file Library it can also check an android app.

### IOT based Climate Monitoring System

In this paper, the author developed a system for rural areas to monitor weather conditions. The heart of this system is raspberry pi & the collected data is sent to the webserver through the GSM parameters monitors.

### Weather Monitoring System using IOT and Cloud Computing

In this paper, the author developed the system in which parameters are monitored using ESP8266 w.3 version WIFI model using ArduinoAma using AWS for cloud software we can check the weather condition

### IOT based Weather Monitoring System

In this paper, the author developed the same in which parameters are monitored using Temperature, Humidity & MQ2 sensors using a WIFI module.

### III. PROPOSED METHODOLOGY

The system consists of multiple nodes placed in distinct locations for monitoring temperature, humidity and pressure in an area. The end nodes are provided with various detectors end nodes send the data to the cloud and the data is stored in a cloud database..

#### 3.1 Hardware Used

##### A. DHT11 Sensor

It is used to determine the distance of the object. Ultrasonic sensors are also used as level sensors to detect, monitor, and regulate liquid levels.

##### B. MQ2 Sensor

It is an open-source hardware and software, development board. Node MCU ESP8266 is one type of controller. It is a board that takes the input from the connected devices to it. This Node MCU act as a wi-fi module. Arduino IOT Cloud is the software used for programming..

##### C. Rain Sensor

It works on the principle of total internal reflection, the resistance is inversely proportional to the amount of water.

##### D. ESP 8266 WIFI Module

It is an 8 pin IC with integrated TCP/IP protocol. It is also known as a serial to WIFI module.

#### 3.2 Software Used

##### A. Thing speak

Thing speak is an IoT platform. Which is allowed to monitor live data in the cloud. We can see the data to thing speak from our device. Whenever creating the channel on thing speak we got the channel id, and AIP keys i.e. Write AIP key and Read AIP key. Write AIP key has a 16-digit code that allows an application to write data to the channel. The read AIP key has a 16-digit code that allows an application to read data stored in the channel. We can see the output on things speak from anywhere.

#### 3.3 Block Diagram

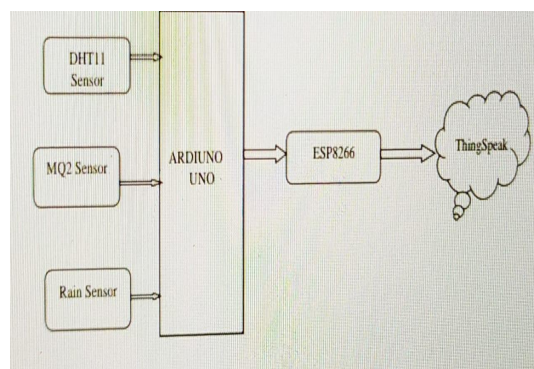


Fig.1. IOT Based Flood Monitoring System using Node MCU

#### 3.4 Working

The block diagram consists of DHT11, Gas, Rain Sensors, Arduino UNO, WIFI module. DHT11 sensor senses the surrounding temperature and humidity and sends the information to the Arduino UNO device. The gas sensor senses

the environmental gas and the information to Arduino UNO. When rainfall will occur the time sensor send the data to the Arduino UNO. The Arduino UNO further uploads this information of the recorded parameters to the Thing speak server using the ESP8266 WIFI module. The user uses this Thing speak server and it acts as the front end of the entire system.

#### IV. RESULTS

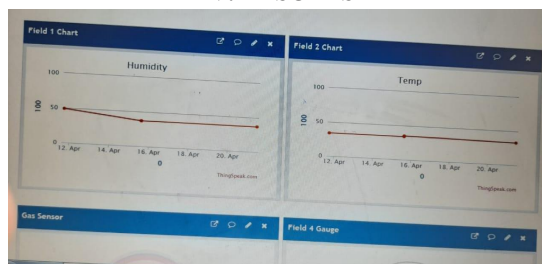


Fig.1: Result of Temperature and Humidity Sensor

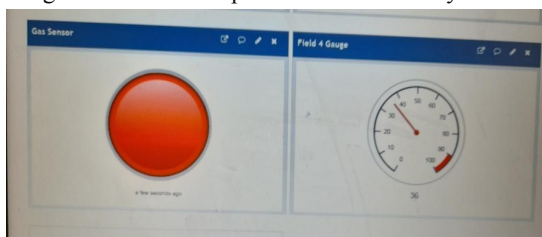


Fig.2.: Result of Gas and Rain Sensor

#### V. APPLICATIONS

- Climate forecasting plays a very important role in the field of agriculture.
- IOT weather monitoring project proves helpful for monitoring the weather at places like volcanoes, and rainforests. It is quiet for a human being to stay for a longer time in such places or even regions which are revealed to have radioactive leakage.
- It is quite difficult for a humanise to stay for a longer time in such places.
- Monitoring of environment.

#### VI. CONCLUSION

By keeping the weather station in the environment for monitoring enables self-protection (i.e., smart environment) of the environment. To implement this need to use the sensor devices in the environment for collecting the data and analysis. By using sensor tools in the environment, we can give rise to the environment in real life, the collected data and analysis results will be available to the user through the Wi-Fi. The smart way to control the environment with an efficient, low-cost embedded system is presented in this paper. It also sent the sensor parameters to the cloud. This data will be helpful for future analysis and it can be easily shared with other users low-cost model can be expanded to monitor the developing cities and industrial zones for pollution monitoring. To protect public health from pollution, this model provides an efficient and low-cost solution for continuous monitoring of the environment.

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#### REFERENCES

- [1]. Suryakant Acharekar, Prashant Dawnade, Binay Kumar Dubey, Prof. Prabhakar Mhadse “ IoT Based Weather

- Monitoring System” 1,2,3,4 Electronics & Telecommunication, Bharat College Of Engineering, University Of Mumbai Received: 14 /April/ 2020 Revised:17/April/2020 Accepted:01/May /2020 Published: 09/May /2020
- [2]. Muhammad Aziz Muslim, Raden Arief Setyawan, Achmad Basuki, Angger Abdul Razak, Fakhriy P Hario, Edward Fernando “ IOT Based Climate Monitoring System” Universitas Brawijaya, Malang, Indonesia Proceedings of the 1st International Multi-Disciplinary Conference Theme: Sustainable Development and Smart Planning, IMDC-SDSP 2020, Cyberspace, 28-30 June 2020
  - [3]. Sarmad Nozad Mahmood, Sameer Alani, Forat Falih Hasan, Mohammed Sulaiman Mustafa, “ESP 8266 Node MCU Based Weather Monitoring” year of publication 2020
  - [4]. Mr. MohitTiwari, Deepak Narang, PriyaGoel, AnupmaGadhwai, Abhinav Gupta And Ankush Chawla “Weather Monitoring System Using IoT and Cloud Computing” Bharti Vidyapeeth’s College of Engineering, New Delhi 2020.
  - [5]. Neeraj Kumar, AlkaAgrawal, R.A.Khan, “Cost Estimation of cellular deployed IoT-enabled network for flood detection”, Iran journal of computer science, 2019.
  - [6]. Girija C, Harshalatha H, Andreanna Grace Shires, Pushpalatha H P "Internet of Things (IOT) based Weather Monitoring System" International Journal Of Engineering Research & Technology (IJERT ) April 2018.