

**International Journal of Research Publication and Reviews** 

Journal homepage: www.ijrpr.com ISSN 2582-7421

### Weather Monitoring System using IOT

#### Mansi Mule<sup>1</sup>, Niranjan Shinde<sup>2</sup>, Shravani Tamboli<sup>3</sup>, Vedant Thorat<sup>4</sup>, Sujata Ghige<sup>5</sup>

<sup>1</sup>Dept. of Electronics & Telecommunication Engineering, Jaihind PolytechnicKuran, Pune, India. <u>mansimule2006@gmail.com</u> <sup>2</sup>Dept. of Electronics & Telecommunication Engineering, Jaihind PolytechnicKuran, Pune, India. <u>niranjan9881259554@gmail.com</u> <sup>3</sup>Dept. of Electronics & Telecommunication Engineering, Jaihind PolytechnicKuran, Pune, India. <u>tambolishravani05@gmail.com</u> <sup>4</sup>Dept. of Electronics & Telecommunication Engineering, Jaihind PolytechnicKuran, Pune, India. <u>vedantthorat1524@gmail.com</u> <sup>5</sup>Dept. of Electronics & Telecommunication Engineering, Jaihind PolytechnicKuran, Pune, India. <u>sujataghige10@gmail.com</u>

#### Abstract—

An IOT-based climate reporting system collects actual-time climate facts using sensors and transmits it wirelessly for analysis and dissemination. This device utilizes IoT era to reveal weather situations like temperature, humidity, and rainfall, providing correct and timely reports to diverse stakeholders, together with individuals and groups, for decision-making in areas like agriculture, aviation, and disaster management. The gadget's records may be accessed via net or cell dashboards, supplying a convenient manner to live knowledgeable approximately cutting-edge weather situations.

Keywords- IOT, Workstation, Sensors, Smart Environment, ESP8266.

#### I. Introduction

In nowadays's rapid-paced and interconnected global, correct and real-time weather forecasting is of paramount Importance for various sectors ranging from agriculture and transportation to catastrophe control. The creation of Cutting-facet technology has revolutionized the field of Meteorology, enabling the monitoring and dissemination of Local climate statistics globally .This research paper affords a Pioneering technique to a reveal and percentage meteorological Conditions worldwide thru the modern use of the Internet of Things (IOT). The Internet of Things is a Ground breaking idea that seamlessly connects a Myriad of devices and sensors in a huge community, enabling them to speak and exchange data. In this context, electronic gadgets, sensors, or even automotive Electronics emerge as essential additives of the IOT Ecosystem.

Leveraging this generation, our proposed System employs a community of sensors to continuously Monitor and modify environmental elements along with Temperature and relative humidity, providing actual-time Data handy through a consumer-pleasant website. Traditionally, climate forecasting relied heavily on human Observations, especially focused on modifications in rainfall and sky Conditions. However, the sphere has developed drastically, with Computer-based totally fashions now gambling a pivotal position in Predicting climate styles. Our proposed IOT-based totally Weather reporting machine empowers customers to access Meteorological parameters on line with out relying on External climate forecasting offerings. The system effectively Utilizes sensors for temperature, humidity, and rain Measurement, providing non-stop monitoring of climate Conditions and delivering actual-time information reporting. Data Collected by rain and temperature sensors is relayed to a Microcontroller, which interprets and transmits it via a Wi-Fi connection to an online internet server. In end, this Research paper introduces an progressive IOT-based weather Reporting machine that revolutionizes the manner we monitor, Forecast, and disseminate meteorological records. By combining Cutting-part technology with traditional forecasting Methodologies, this system offers a reliable and consumer-pleasant Platform for gaining access to actual-time climate statistics, in the long run contributing to informed choice-making throughout various domain names.

#### **II.** Literature survey

#### "Student, Master of Computer Applications, VJTI, Mumbai, Maharashtra, India," Dhanshri Chaudhari Sonali Ajankar, "Master of Computer Applications, VJTI, Mumbai, Maharashtra, India, Assistant Professor" Described:

A major problem in meteorology is accurately predicting rainfall, which can have an impact on a number of industries, including agriculture, water resource management, and disaster planning. In order to create graphical rainfall maps based on historical and present readings, rainfall monitoring systems are vital for gathering vital data on temperature and moisture. After reading through a number of the field's papers, it is clear that none of them have discussed the particular combination of temperature and moisture factors in a system that is interconnected and has selectors for changing these values. Although one study examines the integration of several environmental factors, there are still surprisingly few references to the use of selectors for customisation. Therefore, the primary goal of this research is to close the gap in the literature by creating a system that can efficiently sense the major parameters controlling rainfall creation and predict rainfall with a low degree of error. The literature analysis concludes by emphasizing the

urgent need for a rainfall forecast system that incorporates selectors for customisation along with temperature and moisture factors. The suggested system seeks to close this research gap by increasing rainfall prediction accuracy, which will aid in better planning for agriculture, disaster preparedness, and water resource management. Furthermore, historical soothsaying techniques highlight how crucial it is to develop contemporary techniques to guarantee accurate and scientifically supported rainfall forecasts, which might be essential for a range of applications and decisionmaking procedures.

## The department of information technology and computer applications at Madan Mohan Malaviya University of Technology in Gorakhpur is headed by Puja Sharma and Shiva Prakash.

#### Described:

The author suggested a reliable and reasonably priced automatic weather station. The author of this paper explains how the weather prediction system is becoming a significant issue in every weather extreme event that has a negative impact on the system's ability to anticipate the weather and affect both lives and property. Thus, the weather data's accuracy is one of the most important issues to improve weather forecasting abilities and increase resilience to the negative effects of weather reports.

Sensors can be used in this study to get the environmental parameter. To scale the different parameters, such as humidity, temperature, pressure, and rain value, the author uses an LDR sensor in addition to another sensor. Additionally, the system uses the temperature prototype to determine the dew point value. The value of the specific area, room, or location can be determined using the temperature sensor. The light intensity can be utilized as the author has stated with the aid of the LDR Sensor. When the values of the sensor parameters—temperature, humidity, pressure, light intensity, and rain value—exceed, the author utilized an extra weather monitoring feature as an SMS warning system.

# Department of AIMLE, GRIET, Hyderabad, Telangana, India; M. Sreerama Murthy1, R. P. Ram Kumar1, Billa Saikiran2\*, Islavath Nagaraj2, Tejesh Annavarapu2 AIMLE Department, GRIET, Hyderabad, Telangana, India, 2UG Student Described:

An IOT-based real-time local weather station is proposed by Rajinder Kumar M. Math and Dharwadkar for Precision Agriculture in India [1]. By adopting this approach, the authors want to give farmers a way to automate their farming tasks, including fertilization, irrigation, and harvesting, at the appropriate times. The article details a low-cost weather station that uses an Internet of Things platform to track weather parameters like temperature, humidity, air pressure, rainfall, and soil moisture. In order to help farmers make decisions, the authors also suggest a smart weather prediction system based on artificial neural networks that can forecast weather conditions ahead of time. The study is important because it discusses the difficulties Indian farmers experience as a result of erratic weather patterns and the exorbitant price of traditional weather monitoring equipment.

nternet of Things (IOT)-based climate forecast system that employs a weather forecast algorithm and a few sensors is proposed by Levin Varghese and Gerard Deepak. To predict the weather, the system keeps an eye on air pressure and temperature. In addition to presenting the system's accuracy in weather predicting, the paper details the system's design, implementation, and testing. This article presents a weather monitoring system that uses an Internet of Things method to give real-time temperature and humidity monitoring. An Arduino UNO microcontroller and a DHT11 sensor for temperature and humidity measurement were used in the system's implementation. The goal of the study was to develop a low-cost, effective system with various models for real-time environmental monitoring and alerting.

#### Jayanta Kumar Behera, Abhisek Bera, and Satyabrata Mishra Assistant Professor Jyostnamayee Behera teaches in the Gandhi Institute for Technology's Department of Electronics and Communication Engineering in Bhubaneswar.(AICTE, the All India Council for Technical Education, is the affiliate.)

#### **Described:**

An Internet of Things-based weather monitoring system is described by the author. In this investigation, sensors can be used to gather the ambient parameter. To scale several characteristics including humidity, temperature, pressure, and rain value, the author uses a range of sensors, including the LDR sensor. The dew point value is also calculated using the temperature prototype. The temperature of a certain area, space, or location can be ascertained using the temperature sensor. With the aid of the LDR sensor, the light intensity can be used as the author describes. An SMS warning system based on the value of sensor parameters including temperature, humidity, pressure, light intensity, and rain exceeding the value was used by the author as an extra weather monitoring feature.

Only two devices—Wemos and OLED—are used by the author to measure the weather. After the connection, the data will be shown on the Thingspeak website and saved in the cloud. The system displays the data in the cloud and on an OLED panel. Getting current weather data on an OLED screen is the author's aim. The work's author also shows a comparable NodeMCU-based weather reporting system in which the recorded data in the Thingspeak cloud is displayed via an Android application. As demonstrated in this article, a weather station monitoring system can process and chart the data obtained from the device in real time.

Mohammed Khan 1, Digumarti Sai Jayanth 1, M Shreyash Naidu 1, H. Kanaka Durga Bella 1\*, and Yasir Khan Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad, Telangana, India, Department of Information Technology. 2 Uttaranchal University's School of Applied and Life Sciences in Dehradun, India.

#### Described:

In this study, we describe the creation of an inexpensive wireless weather station that uses a Node MCU to gather and transmit sensor data [1]. accompanied by a graphical application program based on the Internet of Things. The purpose of our weather station is to give consumers quick access to precise meteorological data, such as readings of temperature, pressure, humidity, rainfall, and altitude. In comparison to other reasonably priced weather stations on the market, our experimental findings show that our weather station has good accuracy and stability. The system is cost-effective because of its easy-to-use interface and low maintenance needs. In addition, we hope to improve the system in further work by adding features like precipitation measurement, sun radiation, and wind direction.

To make the system as inexpensive as possible, more research can be done to optimize its cost. Each module's inclusion and positioning in the "IOT Weather Station using Arduino Uno" have been carefully considered and executed [2]. This methodical approach helps the system as a whole operate smoothly. Additionally, the efficiency is further increased by using Wi-Fi technology to transfer the weather sensor data to the Thing Speak web cloud. It has been successfully implemented, accomplishing its goals thanks to careful planning and testing. A wide range of practical fields, including agriculture, archeology, construction, tourism, and many more, benefit greatly from weather monitoring [3].

#### **III.** Methodology

- System Analysis & Requirements: Identify the monitoring desires (e.G., voltage, cutting-edge, temperature) and desires (actual-time statistics, fault detection, predictive preservation) with the aid of consulting with climate reportors.
- System Architecture Design: Plan the device components (sensors, Node mcu, DTH 11sensor BMP 180, communique protocols).
- Hardware & Software Selection: Choose dependable sensors, node mcu, and conversation devices. The ESP32 microcontroller and Wemos patron will
  control all the information, receiving sensor Data from the ESP32 and showing it on an OLED display.
- System Integration: Integrate all components for seamless facts series, transmission, and evaluation.
- Testing & Validation: Conduct practical, overall performance, and redundancy assessments to ensure reliability and accuracy, which includes AIprimarily based predictive preservation validation.
- · Pilot Deployment: Implement the gadget in a constrained wide variety of substations, acquire feedback, and train operators.
- Full-Scale Deployment: Roll out the gadget to all substations, making sure full integration and scalability.
- Continuous Monitoring & Optimization: Monitor device performance, update predictive algorithms, and optimize based on remarks.
- · Post-Deployment Support & Training: Provide on going assist and schooling to operators and make sure device updates and upgrades.

#### **References:**

- [1]. "Master of Computer Applications student, VJTI, Mumbai, Maharashtra, India, Dhanshri Chaudhari, Sonali Ajankar, "Master of Computer Applications, VJTI, Mumbai, Maharashtra, India, Assistant Professor."
- [2]. Shiva Prakash and Puja Sharma, Department of Computer Applications and Information Technology, Mohan Malaviya University of Technology, Gorakhpur.
- [3]. Department of AIMLE, GRIET, Hyderabad, Telangana, India 1 M. Sreerama Murthy1, R. P. Ram Kumar1, Billa Saikiran2\*, Islavath Nagaraj2, Tejesh Annavarapu2 AIMLE Department, GRIET, Hyderabad, Telangana, India; 2UG student.
- [4]. Jayanta Kumar Behera, Abhisek Bera, and Satyabrata Mishra Assistant Professor Jyostnamayee Behera teaches in the Gandhi Institute for Technology's Department of Electronics and Communication Engineering in Bhubaneswar.(Associated with AICTE, the All India Council for Technical Education)
- [5]. Mohammed Khan 1, Digumarti Sai Jayanth 1, Yasir Khan 1 and H. Kanaka Durga Bella 1\*, Department of IT, Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad, Telangana, India. 2 Uttaranchal University's School of Applied and Life Sciences in Dehradun, India.
- [6]. "IOT Based Weather Station" by Ravi Kishore Kodali and Snehashish Mandal, International on Control, Instrumentation, Communication and Computational Technologies (ICCICCT), 2016 IEEE, 978-1-5090-5240-0/16/\$31.00
- [7]. "An IOT based Weather Information Prototype Using WeMos" by Ravi Kishore Kodali and Archana Sahu, 2nd International Conference on Contemporary Computing and Informatics (ic3i), 978-1-5090-5256-1/16/\$31.00, IEEE, 2016
- [8]. "IOT Based Weather Reporting System to Find Dynamic Climatic Parameters," International Conference on Energy, Communication, Data Analytics, and Soft Computing (ICECDS-2017), Kavya Ladi, A V S N Manoj, and G V N Deepak
- [9]. G. Sowmyabala and P. Susmitha "Weather Monitoring and Controlling System Design and Implementation," International Journal of Computer Applications (0975–8887), Volume 97–No.3, July 2014
- [10]. "Weather Monitoring System Using Wi-Fi," (IJSR) ISSN (Online): 2319-7064 Index Copernicus Value (2015): 78.96, 2015 Tanmay Parashar1, Shobhit Gahlot2, Akash Godbole3, Y.B. Thakare4