

DETAILED AND HIGH SPEED SMART IOT BASED WEATHER MONITORING SYSTEM

¹T.Sudha, ²D.Udaya Kumari, ³T.Sathya, ⁴D.Sathiya

¹ Assistant Professor, GanadipathyTulsi's Jain Engineering College, Vellore.

^{2,3,4} UG Student, GanadipathyTulsi's Jain Engineering College, Vellore.

Abstract

We propose a smart weather reporting system over the internet. Our proposed system allows for weather parameter reporting over the internet. It allows the people to directly check the weather stats online without the need of a weather forecasting agency. System uses temperature, humidity as well as rain sensor to monitor weather and provide live reporting of the weather statistics. The system constantly monitors temperature using temperature sensor, humidity using humidity sensor and also for rain. The system constantly transmits this data to the microcontroller, which now processes this data and keeps on transmitting it to the online web server over a Wi-Fi connection. This data is live updated to be viewed on the online server system. Also system allows user to set alerts for particular instances, the system provides alerts to user if the weather parameters cross those values. Thus the IOT based weather reporting system provides an efficient internet based weather reporting system for users.

Keywords: Temperature, Humidity sensor, Raindrop Sensor, IoT, NWP.

1. INTRODUCTION

Weather is the state of the atmosphere, to the degree that it is hot or cold, wet or dry, calm or stormy, clear or cloudy. Most weather phenomena occur in the troposphere, just below the stratosphere. Weather generally refers to day-to-day temperature and precipitation activity, whereas climate is the term for the average atmospheric conditions over longer periods of time. When used without qualification, "weather", is understood to mean the weather of earth. Monitoring the weather conditions manually is difficult. Human beings have attempted to predict the weather informally for millennium and formally since the nineteenth century. Weather forecasts are made by collecting quantitative data about the current state of the atmosphere on a given place and using scientific understanding of atmospheric processes to project how the atmosphere will evolve on that place.

2. INTERNET OF THINGS

IoT is simply the network of interconnected things/devices which are embedded with sensors, software, network connectivity and necessary electronics that enables them to collect and exchange data making them responsive. More than a concept Internet of Things is essentially an architectural framework which allows integration and data exchange between the physical world and computer systems over existing network infrastructure.

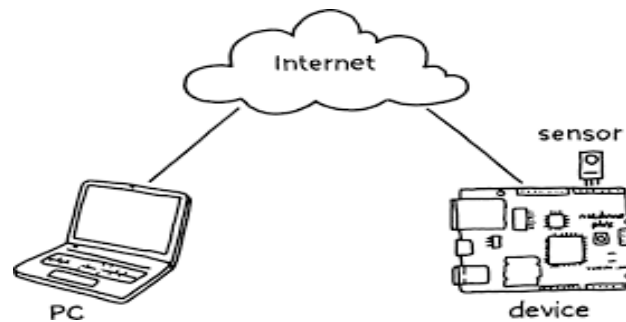


Fig 1. Internet of Things

3. EXISTING SYSTEM

Ancient weather forecasting methods usually relied on observed patterns of events, also termed pattern recognition. For example, it might be observed that if the sunset was particularly red, the following day often brought fair weather. This experience accumulated over the generations to produce weather lore. The weather, persistence, relies upon today's conditions to forecast the conditions tomorrow. This can be a valid way of forecasting the weather when it is in a steady state, such as during the summer season in the tropics. This method of forecasting strongly depends upon the presence of a stagnant weather pattern. It can be useful in both short range forecasts and long range forecasts.

Measurements of barometric pressure and the pressure tendency (the change of pressure over time) have been used in forecasting since the late 19th century. Weather forecasting now relies on computer-based models that take many atmospheric factors into account. Such model is a computer algorithm which predicts the weather (the entire process is known as "Numerical Weather Prediction"), typically run on huge government computers. These are high end systems available for round the clock weather monitoring. But these systems are implemented on a very large scale, for monitoring real time weather for a whole city or state.

4. PROPOSED SYSTEM

The system proposed is an advanced solution for monitoring the weather conditions at a particular place and make the information visible anywhere in the world. The technology behind this is Internet of Things (IoT), which is an advanced and efficient solution for connecting the things to the internet and to connect the entire world of things in a network. Here things might be whatever like electronic gadgets, sensors and automotive electronic equipment. The system will be dealing with monitoring and controlling the environmental conditions like temperature, rain, relative humidity level with sensor and sending the information to the web page. The system is equipped with all sensor devices should acts as client to send the data to the web server. For establishing a connection between the sensor network and internet, we will be using a Wi-Fi module as an additional communication interface controlled by the microcontroller. A Wi-Fi module requires a source of wireless internet connection. Once configuring the Wi-Fi module with

an internet source, it acts as client and sends the sensor data retrieved by the microcontroller. The data which will be updated from the sensor data retrieved by the microcontroller.

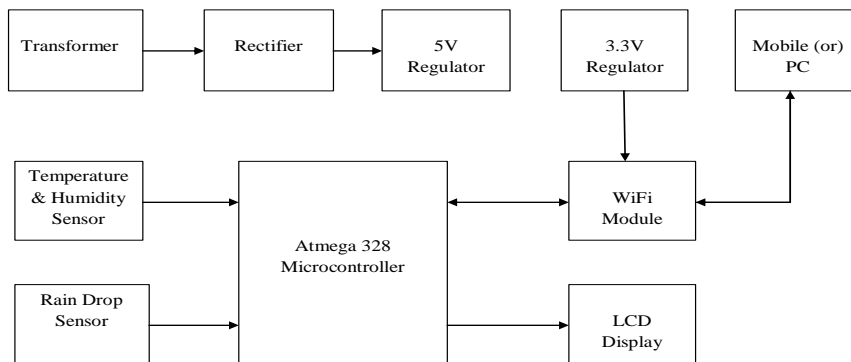


Fig 2. Block Diagram

5. RESULTS AND ANALYSIS

After sensing the data from different sensor devices which are placed in particular area of interest and constantly transmit the data to microcontroller. The weather parameter will be monitoring using this system. Also keeps measuring the parameters and an reports it to the online server over IoT. The sensor interact with which processes this data and transmit it over internet. This allows users to monitor weather parameter in different areas. This provides efficient, low cost solution for continuous monitoring environment.

Timing	Temperature	Humidity	Rain
6.00am	28 ⁰ c	28%	No Rain
10.00am	28 ⁰ c	28%	2mm
1.00pm	31 ⁰ c	26%	6mm
8.00pm	31 ⁰ c	28%	No Rain

Table 1. Measuring the weather parameter

⇒ **Weather Monitoring System**

Humidity 26 %

Rain 6 mm

Temperature 31⁰c

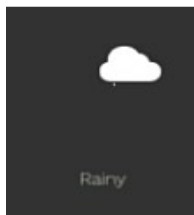


Fig 3. Display weather parameter on website

CONCLUSION

The proposed system can be used to monitor weather parameters accurately over a wide area without taking satellite images. This system provides a cheap, easy and real time solution to monitor the weather parameters. The system helps in reducing the human error. Since all the parameters are displayed online, it can be made available to general public for smart cities. This concludes that the present work was a success and it will provide a competent method for recording real time weather readings and help farmers whose livelihood depends on the weather in a country like India to produce better quality crops. This will have a huge impact on agriculture and also on farmers throughout the world.

REFERENCES

[1] Zigbee based weather monitoring system by The International Journal Of Engineering And Science (IJES) Volume 4, 2015 ISSN (e): 2319 – 1813 ISSN (p): 2319 – 1805 Nisha Gahlot1 , Varsha Gundkal2 , Sonali Kothimbire3 , Archana Thite4, Pune, India.

[2] Arduino Based Weather Monitoring System by International Journal of Engineering Research and General Science Volume 3, Issue 2, March-April, 2015 ISSN 2091-2730 Karthik Krishnamurthi, Suraj Thapa, Lokesh Kothari, Arun Prakash Department of Computer Science, Christ University, Bangalore, India.

[3] Real Time Data Transmission for Weather Monitoring System by International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056 Volume: 03 Issue: 02 | Feb-2016 Prof. Satyashil Nagrale¹, Ms. Poonam Khetmalis², Ms. Sanika Doke³, Ms. Varsha Dherange⁴ Pune, India.

[4] Localised weather monitoring system by International Journal of Engineering Research and General Science Volume 4, Issue 2, March-April, 2016 ISSN 2091-2730, Parijit Kedia, Department of Computer Science, VIT University, Vellore, India.