IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 12, Issue 2, April 2024

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.379

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Refereed Journal |

|| Volume 12, Issue 2, April 2024 ||

International Conference on Recent Development in Engineering and Technology – ICRDET 24

Organized by

Dhaanish Ahmed Institute of Technology, KG Chavadi, Coimbatore, Tamilnadu, India

Smart Farming: Harnessing IOT for Precision Weather Monitoring to Protect Crops

B. Hemalatha, G. Manjula, J. Saranya, U.Rajasekaran

UG Student, Dept. of ECE, Builders Engineering College, Nathakadaiyur, Kangeyam, Tirupur, India

Assistant Professor, Dept. of ECE, Builders Engineering College, Nathakadaiyur, Kangeyam, Tirupur, India

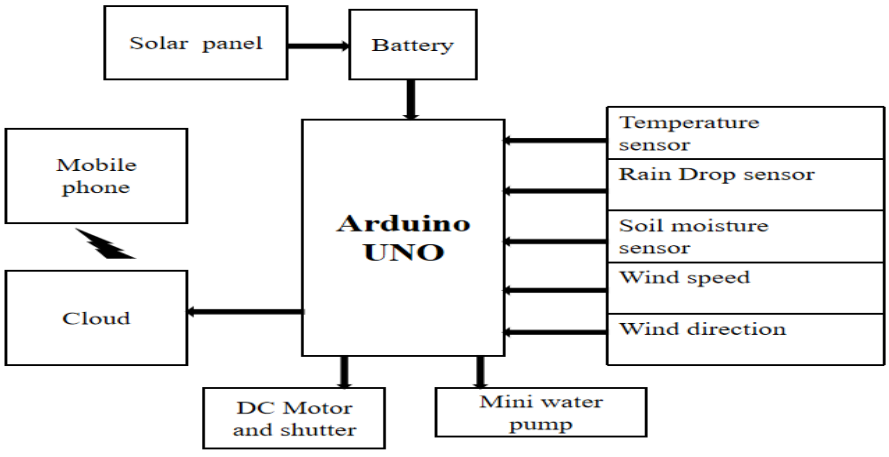
ABSTRACT: In this research, we have developed a system to know the weather conditions of a particular place from anywhere. Based on the data from sensor device, it automatically irrigates the crops, if they need water supply and close the shutter. We are using IoT in this research to link the sensor device to the internet. So that we can get the weather data from anywhere in the world. It uses temperature sensor, soil moisture sensor, infrared sensor, rain drop sensor, anemometer. It can provide the details about the surrounding temperature, humidity, soil moisture, rainfall, wind speed and direction. These sensors send the data to the cloud. Depending on the data, irrigate the crops, if they need water supply. If the wind speed is high, the shutter automatically closes the entire crop.

KEYWORDS: Cloud, Internet of Things, Weather Monitoring System, Smart Environment.

I. INTRODUCTION

Weather monitoring system detecting and collecting various weather data at different locations. This system is achieved by technologies like Internet of Things (IOT) and Cloud. Internet of things is to connect web and to other required connected devices. Using Internet, the data from the sensor device can easily transferred to the cloud and then from the cloud to the reciever. This system using various sensor to monitor the Weather of a particular location where it is placed. IoT is a network of connected devices that collect and transfer data, while cloud computing delivers computing resources and services on-demand over the internet. IoT and cloud computing complement each other, with cloud computing serving as the central hub for **data storage and management** in IoT systems. The data collected from the system is transmitted to cloud and from cloud to the user. This system consists of components like Arduino UNO board with ATmega328 micro controller and a USB connection, DHT11 is temperature and humidity sensor,FC-28 soil moisture sensor to detect the soil moisture, FC-37 Rain drop sensor used to detect the rain, IR sensor used to find the wind direction, The Anemometer is used to measure the wind speed and ESP8266 ESP 01 is a WIFI module is used to transfer the data collected from sensor device to the cloud. The required power of the whole system is taken from solar and stored it in battery.

II. BLOCK DIAGRAM



International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Refereed Journal |

|| Volume 12, Issue 2, April 2024 ||

International Conference on Recent Development in Engineering and Technology – ICRDET 24

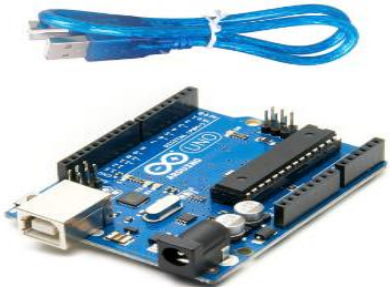
Organized by

Dhaanish Ahmed Institute of Technology, KG Chavadi, Coimbatore, Tamilnadu, India

III. FUNCTIONS OF THE COMPONENTS

1. Arduino UNO:

The **Arduino Uno** is an open-source microcontroller board based on the Microchip ATmega328P microcontroller (MCU). The microcontroller board has digital and analog input/output (I/O) pins that may be interfaced to various boards or sensor devices or other devices. The board has 14 digital I/O pins , 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), through USB cable. The use of Arduino Uno is very simple and user friendly.



2. ESP8266 ESP 01:

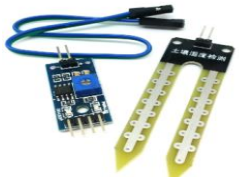
The ESP8266 ESP-01 is a Wi-Fi module that allows microcontrollers access to a Wi-Fi network. This module is a self-contained SOC (System On a Chip) that doesn't necessarily need a microcontroller to manipulate inputs and outputs as you would normally do with an Arduino, for example, because the ESP-01 acts as a small computer.

3. TEMPERATURE SENSOR:

The system consists of a temperature and humidity sensor (DHT 11) is used to monitor the temperature of the environment. 32℃ - 38℃ is a maximum temperature range for growth. If the output of temperature sensor is greater the 38℃ it automatically irrigate the crops.

4. SOIL MOISTURE SENSOR:

Soil moisture level is a important value for crop health. Soil moisture sensor (FC-28) is used to find the soil moisture of the environment. The optimal range of soil moisture content for cropsdepends on the specific plant species, but the range for most crops are between 20% and 60%. Basically the soil moisture produce output as resistance.The more water in the soil, the better the conductivity and the lower the resistance(200 to 300).The less water in the soil, the lower the conductivity and thus the higher the resistance.(400 to 670). The output from the device is greater than 400 , the system automatically irrigate the crops.



International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | Impact Factor: 8.379 | Monthly Peer Reviewed & Refereed Journal |

|| Volume 12, Issue 2, April 2024 ||

International Conference on Recent Development in Engineering and Technology – ICRDET 24

Organized by

Dhaanish Ahmed Institute of Technology, KG Chavadi, Coimbatore, Tamilnadu, India

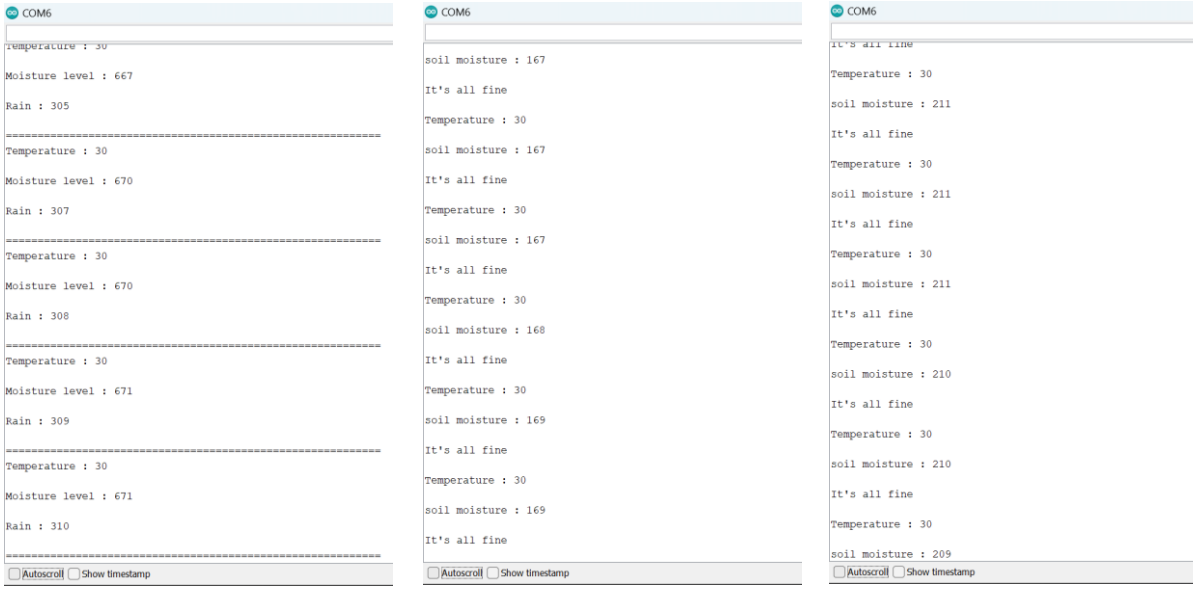
5. RAIN DROP SENSOR:

Rain drop sensor is used to detect the rain. The rain drop produce output as resistance. The more water on the surface of the rain pads the better is the conductivity and will result in a lower resistance. The sensor produces an output voltage through which it determines whether it is raining or not.

6. IR SENSOR:

Usually IR sensor is used to measure the distance of the object. By using this concept we find the direction. In this system we use 4 IR sensor , each one represents the direction North,East, West, South.

IV. RESULTS AND DISCUSSION



We can also see the sensor devices results in serial Monitor in Arduino IDE. Any sensor devices measures the data, if the data exceeds the limit it send to the cloud and from cloud to the user. Depending on the data , irrigate the crops, if they need water supply.If the wind speed is high, the shutter automatically closes the entire crop.

VII. CONCLUSION

This System monitor the changes happening over the environment and provide enough ways for the users to access the knowledge from anywhere through cloud. The temperature will monitor and provides the small print about the changes happening over the climate. Soil moisture sensor monitor the moisture of the place.Anemometer used to measures the wind speed.

REFERENCES

1. Rao BS, Rao KS, Ome N (2016) Internet of Things (IOT) based weather monitoring system. International Journal of Advanced Research in Computer and Communication Engineering Sep 5(9): 312-319.
2. Devanand Wale, D RaghunathRokade, S BaliramAdsul and K S Kazi (2019). Smart agriculture system using IoT, International Journal of Innovative Research in Technology, 5(10), 493-497,
3. Arsheen Shaikh, ShrutiYangal ,"IOT based whether monitoring system", International Journal of Research in Engineering and Science (IJRES) ISSN,volume 10 issue 5,2022.
4. A F Pauzi and M Z Hasan , "Development of IoT Based Weather Reporting System", IOPConf. Ser.: Mater. Sci. Eng.

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

INNO SPACE SJIF Scientific Journal Impact Factor

doi crossref

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details