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Monitoring and Combacting Heat Stress in Paddy Leaves Using Precision Agricultural Techniques

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ABSTRACT: The water requirements in irrigation have been growing and the accurate quantity of water can be produced by a smart irrigation system. Considering this kind of need, this paper aims to develop an Internet of Things (IoT) enabled smart drip irrigation system by applying Web/Android applications that will provide a solution for continuous monitoring and controlling the drip irrigation system to avoid the problem of constant human vigilance and waste of water. It also facilitates prevention by giving automatic water to plants lying on water necessities. It can also convince be capable in Agricultural fields, Parks, Lawns, etc. With the advancement of technology, there are always reducing work and making work simpler. The embedded system provides a solution for solving this kind of problem. In this paper, a smart drip irrigation system is established which is driven by lit and web-based applications. The web application is also designed for taking appropriate action for the user during drip irrigation. This application provides the appropriate amusant of water from the pump for gardening. 11 accomplished by incorporating different urnues within the system to observe the humidity, temperature, and soil moisture condition which transmits the data to the micro-controller for proper estimating the water needs of the plants. This kind of system can be controlled and visual lard in the android mobile phone through a with application anywhere.

KEYWORDS*:* smart irrigation system, drip irrigation, web application.

I. INTRODUCTION

With an increasing population in the world, the requirement of the foodproduction rate has been increased specially in India where agriculture is a major livelihood source. To obtain a healthier quality and sustainable production rate of foods, the requirementof freshwater is also increased for irrigation. Currently, agriculture accounts hold total the water consumption of 83% in India. Considering this aspect, the water for various applications has not been using in a planned manner consequently, the water is wastage in different places. Therefore, this shows that there is a demand to develop such systems forsolving the problem without the wastage of water.

II. LITERATURE REVIEW

1) IOT Enabled Smart Drip Irrigation System Using Web/Android.Applications

Ravi Kant Jain; Bikash Gupta; Mustaq Ansari; Partha Pratim Ray

The water requirements for irrigation have been very demanding nowadays. There is a requirement for a wise irrigation system which will save a good amount of water. In the world, water and food are two of the most important resource, which makes agriculture crucial to mankind.

2) IOT based crop-field monitoring and irrigation automation

P Rajalakshmi; S. Devi Mahalakshmi

Internet Of Things (IoT)is a shared network of objects or things which can interact with each other provided the internet connection. IoT plays an important role in agricultureindustry which can feed 9.6 billion people on the Earth by 2050. Smart Agriculture helps to reduce wastage, effective usage of fertilizer and thereby increase the crop yield.

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3) Artificial Intelligence (AI) in Agriculture

V. Dharmaraj and C. Vijayanand

The United Nations FAO (Food and Agriculture Organization) states that the world population would increase by another 2 billion in 2050 while the additional land area under cultivation will only account to 4% at that time. In such circumstance more efficient farming practices can be attained using the recent technological advancements and solutions tocurrent bottlenecks in farming.

III. EXISTING SYSTEM

In existing system GSM that multiple users share the same bandwidth. With enough users, the transmission can encounter interference. Therefore, faster technologies, such as 3G, have been developed on different types of networks than GSM, such as CDMA, in order to avoid such bandwidth limitations.

GSM uses FTDMA access scheme. Here multiple users share same bandwidth and hence will lead to interference when more number of users are using the GSM service. In order to avoid this situation, robust frequency correction algorithms are used in mobile phones and base station.

DISADVANTAGES:

1. To increase coverage repeaters are required to be installed.
2. There is no end-to-end encryption of user data.
3. Several incompatibilities within the GSM standards.
4. Electromagnetic radiation is more with the use of GSM.
5. Macro cells affected by the multipath signal loss.

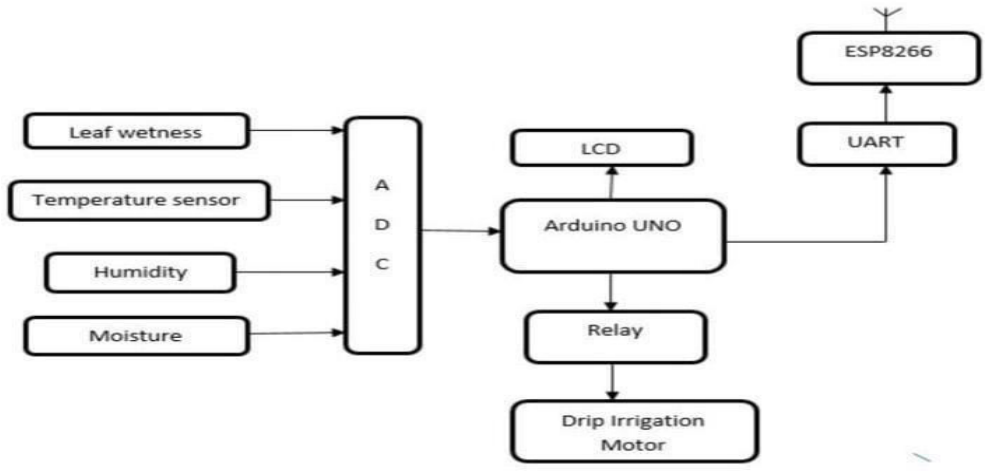
IV. PROPOSED SYSTEM

The Smart irrigation System has wide scope to automate the complete irrigation system. Here we are building a IoT based Irrigation System using Arduino UNO. It will not only automatically irrigate the water based on the moisture level in the soil but also send the Data to IOT page to keep track of the land condition. The System will consist of drip irrigation motor on the land depending upon the land environmental condition such as Moisture, Leaf wetness, Temperature and Humidity.

ADVANTAGES OF PROPOSED SYSTEM:

1. Efficient resource utilization
2. Minimize human effort.

BLOCK DIAGRAM:



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COMPONENTS

WETNESS SENSOR 237:

Monitoring the moisture level in plant leaves. The 237 measures leaf wetness by determining the electrical resistance on the surface of the sensor. (A wet surface is less resistant.) It is primarily used to determine the percentage of time that a leaf surface is wet, versus the timeit is dry.

SOIL MOISTURE SENSOR: This soil moisture sensor module (LM393) is used to detect the moisture of the soil. It measures the volumetric content of water inside the soil and gives us the moisture level as output. The module has both digital and analog outputs and a potentiometer to adjust the threshold level..

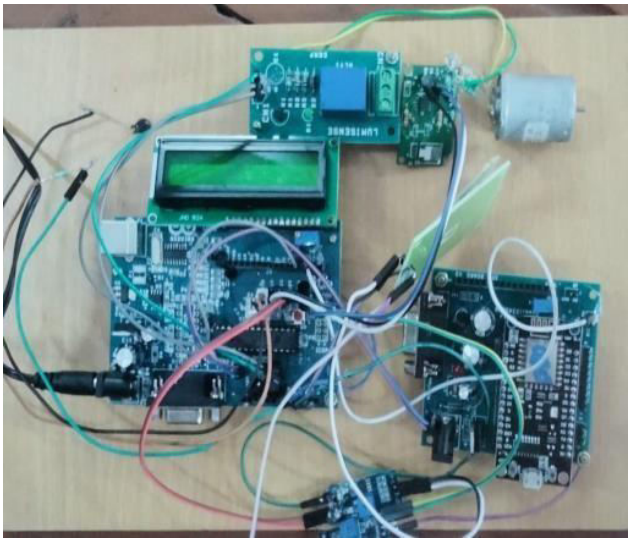
TEMPERATURE SENSOR: It will measure the temperature .NTC 103 THERMISTOR The "103" in NTC 103 signifies that these thermistors have a nominal resistance of 10,000 ohms (10k ohms) at a temperature of 25 degrees. The main use of a thermistor is to measure the temperature of a device. In a temperature controlled system, the thermistor is a small but important piece of a larger system. A temperature controller monitors the temperature of the tie.

HUMIDITY SENSOR: It will measure humidity. Humidity sensor can detect conditions favorable to plant growth. A humidity sensor is an instrument which measures the humidity of air or some other gas: that is, how much water Vapor it contains. Humidity measurement instruments usually rely on measurements of some other quantities such as temperature, pressure, mass and mechanical or electrical changes in a substance.

ESP8266:It is an micro controller with Wi-Fi module. The ESP8266 is a low-cost Wi-Fi microchip, with built-in TCP/IP networking software, and microcontroller capability, produced by Espressif Systems in Shanghai, China. ESP8266. ESP8266-IC. Manufacturer.

UART: Universal Asynchronous Receiver and Transmitter. The signal will be received and transmitted.

PHOTOGRAPH OF MACHINE:



V. CONCLUSION

The proposed project is a step towards smart and precision agriculture increasing the overall crop yield. The usage of sensors contributes towards precision agriculture, as accurate data from the sensors are used to precisely irrigate the field when required. The usage of IOT plays the role of making the system smart by providing the choice to the user to decide if and when the irrigation is required. It can thus play a vital role in the field of agriculture, ultimately contributing to the overall wellbeing of the society.

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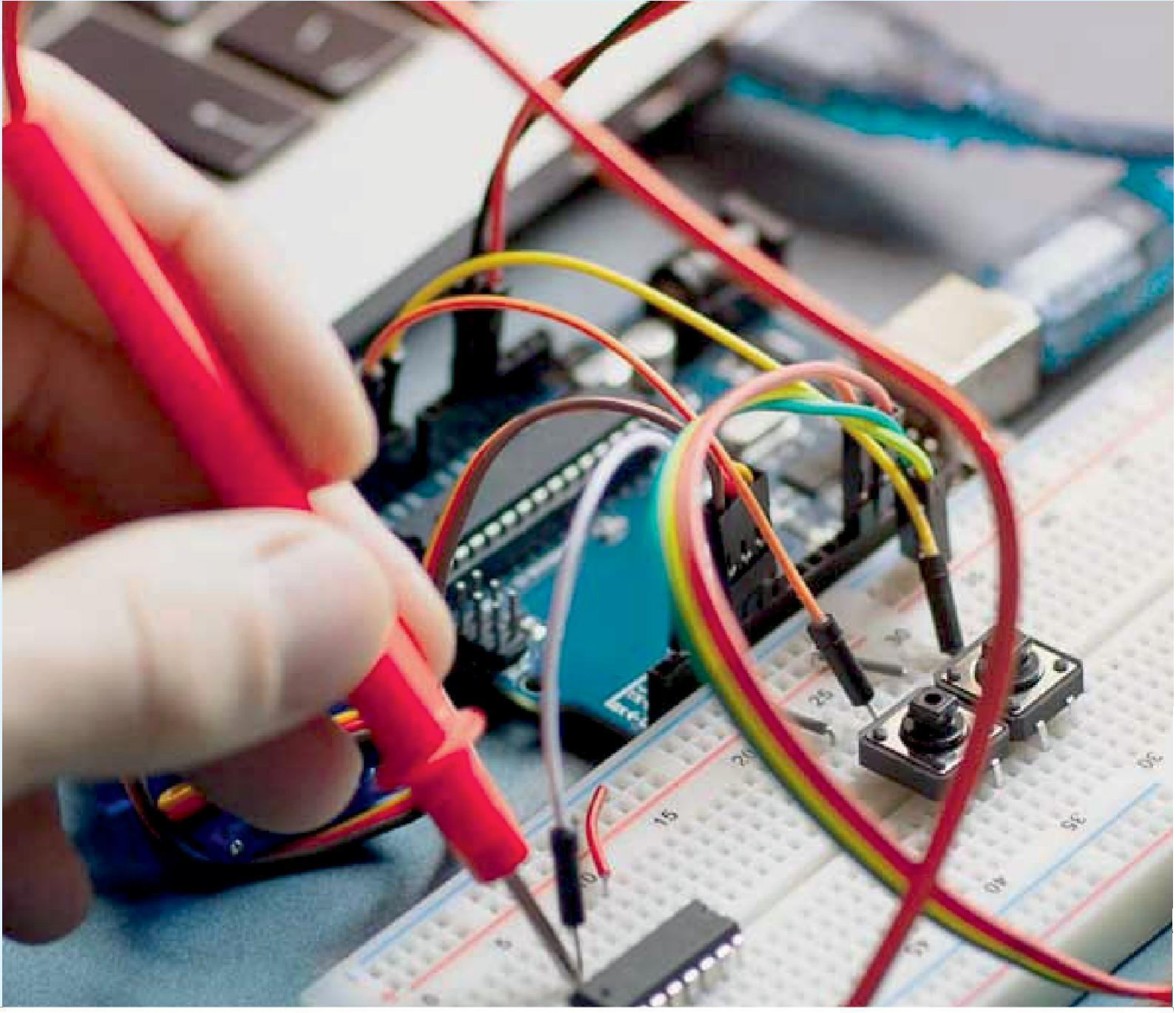

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