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Iot Based Plant Monitoring System

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Abstract: In the iot based smart plant monitoring system we can monitor and controlusing iot . It is very difficult to controlscattered without a remote environment monitoring system. Inrecent years, there appeared a canopy remote monitoring system based on Ethernet.In this project we use different modules such as IOT, arduino as controller, Temperature sensor, Moisture sensor, Humidity sensor. This project uses sensors such as A humidity sensor is also given to know about the atmospheric humidity of that place.By having knowledge of all these one can take actionaccordingly. Moisture sensor sense the soil is dry or wet. If soilis dry automatically water pump will get ON. And the sensorvalues are given to ADC to get processed by arduinocontroller. The temperature sensor LM35 senses thetemperature and converts it into an electrical (analog) signal,which is applied to the micro controller through ADC. The analog signal is converted into digital format by the analog-to-digital converter (ADC). If temp increases more than setthreshold value. Automatically fan will be ON. In this projectwe are using dry/wet sensor, humidity sensor andTemperature sensor.. To overcome this problem we use wireless device to monitor the parameters so that we can take certain steps even in worst case. Few years back the use of wireless device was very less, but due the rapid development is technology now-a-days we use maximum of our data transfer through wireless like Wi-Fi, Bluetooth, WI-Max, etc. This project is designed as a plant monitoring system based on IOT.

1. INTRODUCTION :

We live in a world where everything can be controlled and operated automatically, but there are still a few important sectors in our country where automation has not been adopted or not been put to a full-fledged use, perhaps because of several reasons one such reason is cost. One such field is that of agriculture. Agriculture has been one of the primary occupations of man since early civilizations and even today manual interventions in farming are inevitable. Plant monitoring form an important part of the agriculture and horticulture sectors in our country as they can beused to grow plants under controlled climatic conditions for optimum produce. Automating a plant monitoring and controlling of the climatic parameters which directly or indirectly govern the plant growth and hence their produce.

Automation is process control of industrial machineryand processes thereby replacing human operators.in this paper the presented plant monitoring system technology to provide feedback to the user through smart phone. The automated system will reduce the need of man power hence reducing the error for a large scale area,it is quite impossible for a farmer to monitor the efficiency of the system implementing thistechnology, the farmers can easily monitor the

system using there smart phone.

Block diagram

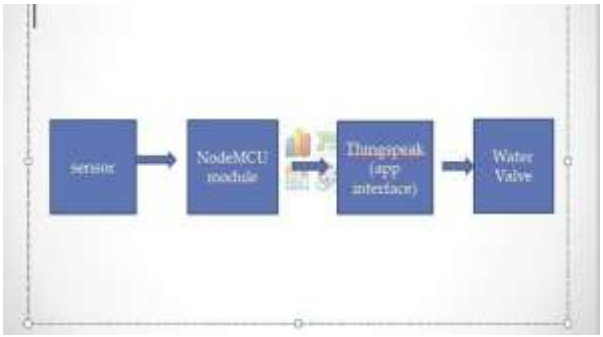

fig1.1: Block Diagram:

The block diagram is a way in which the principle parts are presented under blocks connect with the lines which showed the relationship of these ways. These are deeply used in engineering whole world its hardware graph, electronic design, software digraph and diagram. The block diagrams relyon the ethics of the black box which the article are mystic from sight either to eliminate being distracted bythe details are not well known. Also know that which goes inland goes out but we cannot see how it works.

LIST OF COMPONENTS USED INCIRCUIT:

Relay module

1. Aurduno compiler
2. Solenoid water valve
3. DHT11 temperature and humidity Sensor
4. Adapter
5. PCB
6. Relay module
7. Soil Moisture Sensor
8. Node MCU8266

OPERATIONS:

Node MCU is an open source IOT platform. While writing code on Node MCU, you cant address them On the other side for measuring temperature DHT11 sensor use a NTC temperature sensor or a thermistor. A thermistor changes its resistance with change of the temperature because it is variable resistor. Thesesensors are made by sintering of semi-conductivematerials (ceramic and polymers), which provide with actual Pin Numbers. There are different I/O Index numbers assigned to each Pin which is used for Pin addressing. ESP8266 offers a complete and self- contained WIFI networking solution; it can be used to host the application or float WIFI networking functions from another application processor. When ESP8266 hosts the application, it boots up directly from an external flash. In has integrated cache to improve the performance of the system in such application sd.DHT 11 (Temperature and Humidity): DHT11 consist of both humidity and temperature sensor. For measuring humidity there are two electrodes with moisture holding substrate between them. So when the humidity changes, the resistance between these electrodes changes and conductivity of the substratechanges. This change in resistance are measuredand processed by

the IC which makes it ready to be read by a nodemcu8266. Large changes in the resistance with just small changes in temperature. The term NTC means Negative Temperature Coefficient, which means that the resistance decreases with increase of the temperature

WORKING

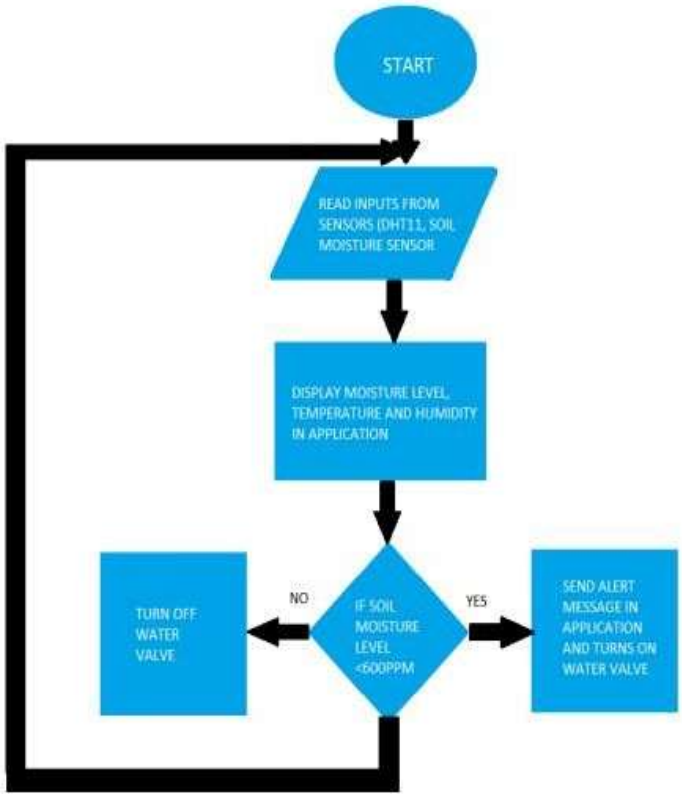

Fig.2.2: Flowchart of plant monitoring systemAlgorithm of of plant monitoring system

Step 1: Start

Step 2: Initialize all the devices, DHT11, Soil moisture sensor, , Node mcu and mobile application

Step 3: Collect the sensors output .

Step 4:Display the value on Mobile app

Step 5: Check the value of Soil moisture
a. If value>threshold, turn on the water pump
b. If value<threshold, go to step 4.

Step 6: Check the value of DHT11

Step 7: Sending alert messages to the user using WiFi module

Step 8: Go to step 3

Step 9: End

In image processing, a recognition system capable of identifying plants by using the images of their leaves, stem has been developed and with the helpof the image compare with previous plant images. Identify the problem in database and find it. Then choose the rectified natural pesticides and spread to the affected plants. The different features that are extracted and compared are color, texture and shape of the leaf. Here we combine IOT and Image processing. In addition, our system is simple to use,fast and highly calculable. In an industry during certain hazards is will be very difficult to monitor the parameter through wires and analog devices such as transducers. To overcome this problem we use wireless device to monitor the parameters so that arduino andTemperature Sensor soil moisture Contrast Soil Humidity Sensor Water Pump IOT wecan take certain steps even in worst case. Few years back the use of wireless device was veryless, but due the rapid development is technology now-a-days we use maximum of our datatransfer through wireless like Wi-Fi, Bluetooth, WI-Max, etc. This project is designed as aplant monitoring system based on IOT.
In this project we use different modules such as IOT, arduino as controller, Temperature sensor, Moisture sensor, Humidity sensor. Thisproject uses sensors such as a humidity sensor is also given to know about the atmospheric humidity ofthat place. By having knowledge of all these one can take action accordingly. Moisturesensor sense the soil is dry or wet. If soil is dry automatically water pump will get ON. the sensorvalues are given to ADC to get processed by arduino controller. The temperature sensor LM35senses the temperature and converts it into an electrical (analog) signal, which is applied to themicro controller through ADC. The analog signal is converted into digital format by the analog-to-digital converter (ADC).If temp increases more than set threshold value. Automatically fan willbe ON. In this project we are using thingspeak cloud, dry/wet sensor, humidity sensor and Temperature sensor

2. RESULT :

The Output of the proposed system is fast,accurate and secure. Hence, the experimental results show that the proposed system is easy to access and protects the plant from being rotten or drought.

Hardware Output:

Fig 12: Hardware Design

The hardware setup of the system includes NodeMCU as the controller. It is powered by a 9V battery source. The temperature sensor and the soil moisture sensor areconnected to the node mcu using jumper wires. The relay module is used to control the solenoid valve. The control signal for the solenoid valve is provided through the nodemcu8266. Once the setup is complete, the next step is to link the device with the IoT application that is installed in the smartphone. The smartphone then sends the control signals that control the on and off functions of the solenoidvalve.It can be seen that the entire setup is simple, compact and very user friendly.

swoftware output.

Fig Swoftware output

3. CONCLUSION:

This whole project mainly focuses on two results. The first result is to help farmers to upgrade their agriculture – technical knowledge, act in accordingly with minimum requirements on environmental issues and mostly the basic function being prevented by major disasters and protect plants and nature from being ruptured. And the second result of our project is to The application installed in the android smartphone displays the parameters like soilmoisture, temperature and humidity. ThishelpsIn monitoring the current condition ofthe plant. Abutton is displayed with whichthe solenoid watervalve can be controlled. When the moisture level fallsBelow100 orwhen the temperature rises beyond normalroom temperature, say degrees the water valve is turned on by clicking the button. use technology to measure the humidity, temperature and moisture. ofthe plant root and make the plant grow in a well suitable environment with out the use of soil as per the concept of hydroponics. The farmer or user receives the message regarding the status and thus helps in avoiding delay of plant watering and protect the plant to live in a suitable environment.

4. REFERENCES:

[1] A. Pravin, T. Prem Jacob and P. Asha (2018) ‘Enhancement of plant monitoring using IoT’, InternationalJournal of Engineering and Technology, Volume 7 (3.27).

[2] Monirul Islam Pavel, Syed Mohammed Kamruzzaman, Sadman Sakib Hasan, Saifur Rahman Sabuj (2019) ‘An IoT based plant health monitoring system implementing using Image Processing’, IEEE 4th International Conference on Computer and Communication systems.

[3] Nivesh Patil, Shubham Patil, Animesh Uttekar, A.R Suryawanshi (2020) ‘Monitoring of hydrophonics system using IoT technology’, International Research Journal of Engineering and Technology, Volume: 07, issue: 06.

[4] Pratima Amol Kalyankar, Altaf O. Mulani, Sampada P. Thigale, Pranali Gajanan

Chavhan and Makarand M. Jadhav, "Scalable face image retrieval using AESC technique", Journal Of Algebraic Statistics Volume 13, No. 3, p. 173 –176, 2022

[5] Rahul G. Ghodake and A. O. Mulani, "Sensor Based Automatic Drip Irrigation System", Journal for Research, 2016.

[6] P. B. Mane and A. O. Mulani, "High Speed Area Efficient FPGA Implementation of AES Algorithm", International Journal of Reconfigurable and Embedded Systems, Vol. 7, No. 3, November 2018, pp. 157-165 DOI: 10.11591/ijres.v7.i3.pp157-165

[7] Renuka Kondekar and A. O. Mulani, "Raspberry pi based voice operated Robot", International Journal of Recent Engineering Research and Development (IJRERD), Vol. 2 Issue 12, Dec. 2017

[8] Kulkarni P.R., Mulani A.O. and Mane P. B., "Robust Invisible Watermarking for Image Authentication", In Emerging Trends in Electrical, Communications and Information Technologies, Lecture Notes in Electrical Engineering, vol. 394,pp. 193-200, Springer, Singapore, 2017.

[9] Bhanudas Gadade and Altaf Mulani, "Automatic System for Car Health Monitoring, International Journal of Innovations in Engineering Research and Technology, 57–62, 2022

[10] Leonid Spirin. (2022). Analysis Of Basketball Selection Systems On The Example Of The Usa And Uzbekistan. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(01), 1–5. https://doi.org/10.55529/jipirs.21.1.5

[11] M.D.Thamarai Selvi. (2022). Global language in the field of maritime – the backbone of global trade. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(01), 6–13. https://doi.org/10.55529/jipirs.21.6.13

[12] Dr. Nimisha Beri, & Shivani Gulati. (2022). Cyberloafing As A Challenge For Integration Of Ict In Education. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(01), 14–19. https://doi.org/10.55529/jipirs.21.14.19

[13] Dr. Dinesh kumar, & Abdulhamid Sanusi Ahmad2. (2022). Theoretical Models Of Technology Acceptance: A Critical Analysis & Design For Future Research. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(01), 20–31. https://doi.org/10.55529/jipirs.21.20.31

[14] Rashid Manzoor Bhat, & Peer Amir Ahmad. (2022). Social Media and the Cyber Crimes Against Women-A Study. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(01), 32–36. Retrieved from http://journal.hmjournals.com/index.php/JIPIRS/article/view/634

[15] Umarfarooq A Halyal, & Maheajabeen A Choudhary. (2022). Indigenous Cosmetic Home Remedies by utilizing waste food, vegetables and organic products. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(02), 1–10. https://doi.org/10.55529/jipirs.22.1.10

[16] Fowsiya P A, Rajesh P, Rajkumar G, & Maheswaran K. (2022). Optimization of Energy Conversion Efficiency of PV System. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(02), 11–19. https://doi.org/10.55529/jipirs.22.11.19

[17] Maheswaran K, Anoopkumar M V, David E, & Saranya Nair. (2022). Wireless Charging of Electric Vehicle. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(02), 20–25. https://doi.org/10.55529/jipirs.22.20.25

[18] Md. Jannatul Ferdous, Nayan Sarker, Chinmoy Das, Md. Tabil Ahammed, & Zayed Mohammad. (2022). Design and Analysis of A High Frequency Bow-tie Printed Ridge Gap Waveguide Antenna. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(02), 26–38. https://doi.org/10.55529/jipirs.22.26.38

[19] Md. Tabil Ahammed, Shadat Hossain, Md. Mehedi Hasan, Golam Rabby, & Nazmul Huda. (2022). Superior Short circuit & Overcurrent Protection of Devices like Alternator, Transformer etc. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(02), 39–46. https://doi.org/10.55529/jipirs.22.39.46

[20] Dr. Sobha Manakkal, Rajeenamol P T, & Sundaramoothi P. (2022). A Comparative Study Of Different Topologies Of Transformer less AC-DC Converters. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(03), 1–9. https://doi.org/10.55529/jipirs.23.1.9

[21] Dr Echeta, & Sydney Onuchukwu. (2022). Impact Of Event Tourism On Lagos Residents Image. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(03), 10–19. https://doi.org/10.55529/jipirs.23.10.19

[22] Hemang Desai, & Birajkumar V. Patel. (2022). A Model for Gujarati News Search Engine by Link Builder and Web Crawler Algorithms. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(03), 20–23. https://doi.org/10.55529/jipirs.23.20.23

[23] Ms. Pinal Solanki. (2022). "A Study on Emotion Detection & Classification from Text using Machine Learning". Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(03), 24–30. https://doi.org/10.55529/jipirs.23.24.30

[24] Idiang, Magdalene Ime, Muhammad Shehu Shuaibu, Sweta Dixit, Linus Beba Obong, & Bilkisu Baba Bala. (2022). The Effects Of Overcrowding On Students Living In University Of Calabar Female Hostel, Cross River State, Nigeria. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(03), 31–49. https://doi.org/10.55529/jipirs.23.31.49

[25] Showkat Ahmad Dar. (2022). Role of E-governance in Higher Education in Jammu and Kashmir. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(04), 1–8. https://doi.org/10.55529/jipirs.24.1.8

[26] Rashid Manzoor Bhat. (2022). An Analytical Study of the Kushan Rule in Kashmir. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(04), 9–14. https://doi.org/10.55529/jipirs.24.9.14

[27] Ms. Ritu Bhatiya. (2022). "A Study and Analysis on Color Coded Cryptography on Textual Data". Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(04), 15–21. https://doi.org/10.55529/jipirs.24.15.21

[28] Sudipto Ghosh, & Md. Tabil Ahammed. (2022). Effects of Sentiment Analysis on Feedback Loops between Different Types of Movies. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(04), 22–28. https://doi.org/10.55529/jipirs.24.22.28

[29] Aqib Yousuf Rather. (2022). A Note on Conception of Aurangzeb Alamgir Religious Policy. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(04), 29–36. https://doi.org/10.55529/jipirs.24.29.36

[30] Rashid Manzoor Bhat. (2022). Queen Yasovati: A Descriptive Study on her Leadership in the Kingdom of Kashmir. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(05), 1–7. https://doi.org/10.55529/jipirs.25.1.7

[31] Aadil Ahmad Shairgojri, & Showkat Ahmad Dar. (2022). Voices from India's Borderlands against the Citizenship Amendment Act (CAA-2019) An Explanatory study. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(05), 8–18. https://doi.org/10.55529/jipirs.25.8.18

[32] Shabir Ahmad Lone. (2022). Reflections of Dr. B.R Ambedkar's Idea of Social Justice. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(05), 19–25. https://doi.org/10.55529/jipirs.25.19.25

[33] Shabir Ahmad Lone. (2022). The Legacy of Chak Rule in Jammu and Kashmir an Explanatory Study. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(05), 26–33. https://doi.org/10.55529/jipirs.25.26.33

[34] Fatima Akther. (2022). Impact of Information and Communication Technology (Ict) On the Curriculum Upgradation and Career Aspiration of Students. Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, 2(05), 34–42. https://doi.org/10.55529/jipirs.25.34.42