iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** IV **Month of publication:** April 2022

DOI: https://doi.org/10.22214/ijraset.2022.41352

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue IV Apr 2022- Available at www.ijraset.com

IoT Based Temperature and Soil Monitoring System with Motor Pump Control

Rutuja S. Ghumatkar[1], Megha K. Hulbatte[2], Mohini M. Gaikwad[3], Mrs. R. B. Gurav[4]
[1, 2, 3]*Department of Information Technology, AISSMS, Polytechnic, Pune, Maharashtra, India*
[4]*Guide*

Abstract: ***To serve the humanity nowadays technology is playing an exquisite role and a man's basic and first need is food indeed. It will be said that about over 85% of individuals of India are directly, indirectly relied on agriculture. Proper irrigation by pump can not be maintained because of frequent power outages, unavailability of grid lines in remote areas and scarcity/cost of fuel to run pumps. to create the sustainable irrigation system and field monitoring system for convalescing crops growth also as best production, this IOT based Automatic irrigation system is proposed. during this system IOT and WSN are wont to control and monitor the irrigation system. IOT is employed to get stored data monitoring and real time monitoring of varied contents of soil. WSN is employed to create a totally wireless system to form a user-friendly system to cultivate and irrigate water properly to the sphere. Different types of sensors are used. This report presents a totally automated drip irrigation system which is controlled and monitored by using "Thinks peak Cloud Server". Temperature and also the humidity content of the soil are frequently monitored. The system informs user about any abnormal conditions like less moisture content and temperature rise, even concentration of water by sending notifications through the wireless module.***

I. INTRODUCTION

From past agriculture has been part of the human civilization. it's transformed the way humans survive. The economy of a selected area was indirectly captivated with agriculture, and was a serious thrust behind the commercial revolution. Temperature and humidity are vital environmental elements that has to be controlled for healthy plants. Humidity controls the speed of transpiration and the way the nutrients are received by the plants. Ideal humidity levels in an exceedingly grow room range between 50% to 70% in vegetative growth, and 50% to 60%for flowering plants. Soil moisture is one among the most important parameters influencing crop yields.

Fig 1: Agriculture

It plays a crucial role for efficient photosynthesis, respiration, transpiration and transportation of minerals and other nutrients through the plant. Proper irrigation schedule is very critical to plant growth. If the moisture content of a soil is optimum for plant growth, plants can readily absorb soil water. Soil water dissolves salt and makes up the soil solution, which is important as medium for supply of nutrients to growing plants.

II. LITERATURE SURVEY

This system uses Arduino technology to manage watering and roofing of the green house.

1) It uses statistical data acquired from sensors (like temperature, humidity, moisture and light-weight intensity sensors) compared with the forecast for higher noises. Kalman filter is employed to eliminate noise from the sensors.

2) Agriculture System (Argosy's) uses temperature, pH, humidity sensors then the hybrid inference to input the knowledge from sensors. The system monitors the sensors information on LCD and PC.

3) Muhammad (2010),proposed a simple approach to Automatic Irrigation control problem using Artificial Neural Network Controller. The proposed system is compared with ON/OFF controller and it's shown that ON/OFF Controller based System fails miserably because of its limitations. On the other hand, ANN based approach has resulted in possible implementation of upper and more efficient control. These controllers don't require a previous knowledge of system and have inherent ability to ANN based systems can save lot of resources (energy and water) and might provide optimized results to any or all or any type of agriculture areas.

4) Sanju Kumar (2013), proposed Advance Technique for Soil Moisture Content Based Automatic Motor Pumping for Agriculture Land Purpose was developed and successfully implemented along with flow sensor. Salient features of the system are: control system automatic irrigation system, temperature and water usage monitoring. User can easily preset the quantity of the Moisture and is typically updated about current value of all Parameters on LCD display. In future, other important soil parameters namely soil pH, soil electrical conductivity are visiting be incorporated within the system.

5) S Nalini Durga (2018) proposed Smart Irrigation System supported Soil Moisture Using Iot Agriculture remains the world which contributes the simplest to India's GDP. But when considering technology that's deployed during this field, we discover that the event isn't tremendous. Now a days there's huge enhancement in technologies which have an unlimited impact on various fields like agriculture, healthcare etc. Agriculture is that the first occupation in our country. India's major income source is wishing on agriculture therefore the event of agriculture is significant. In today also most of the irrigation systems are operated manually. The available traditional techniques are like drip irrigation, sprinkler irrigation etc. These techniques are should be combined with IoT so we are able to make use of water vary efficiently. IoT helps to access information and make major decision-making process by getting different values from sensors like soil moisture, water level sensors, water quality etc. PlagiarismDetector.net is offering one in every of the simplest paraphrasing tool to rephrase sentences. it's the power to craft highly unique, readable.

III. METHODOLOGY

The planned algorithmic rule uses sensors knowledge of recent past and also the weather forecasted knowledge for prediction of soil wet of coming days. the anticipated price of the soil wet is healthier in terms of their accuracy and error rate. Further, the prediction approach is integrated into a standalone system epitome. The system epitome is price effective, because it is predicated on the open normal technologies. The machine mode makes it a sensible system and it may be additional tailor-made for application specific eventualities. In future, we have a tendency about to conduct a water saving analysis supported planned algorithmic rule with multiple nodes in conjunction with minimizing the system price. system to observe temperature, humidity, wet levels within the soil was designed and also the project provides a chance to review the present systems, in conjunction with their options and downsides. Agriculture is one amongst the foremost water-consuming activities. The planned system can be used to switch the motor (on/off) counting on favorable condition of plants i.e sensor values, thereby automating the method of irrigation. that is one amongst the foremost time economical activities in farming, that helps to forestall over irrigation or below irrigation of soil thereby avoiding crop harm. The farm owner can monitor the process online through an automaton App. although this project may be complete that there may be sizable development in farming with the utilization of IOT and authentication.

1) Once power provide is ON, the input module of 3 sensors (DHT22, moisture) begin to activate.

2) Once sensors get on that can scan the information from soil and from close.

3) In step with the values that ar detected by sensors motor can flip ON/OFF.

4) If wet below threshold price, then the motor is activate.

5) If wet level is high, then it'll stop the motor and facility also will stop.

6) If Water level is low in tank, then it'll even have detected by the supersonic detector.

7) All the values that ar collected from detector is send via ESP8266 Wi-Fi module to factor speak cloud. Server and it store in on-line database(firebase) via dummy server.

8) Factor speak can produce the graph for the information received by WI-FI module.

9) And, then whole data can show on the automaton app.
10) User will simply management the motor manually by victimization automaton app.

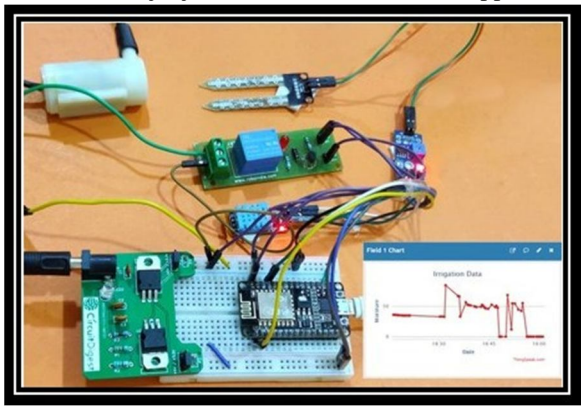


Fig 2: Temperature and soil monitoring system model

IV. SPECIFICATION OF A SYSTEM

Item	Specification.
Arduino Uno	ATmega328P – 8 bit AVR family microcontroller, Operating Voltage 6-20V, DC Current on I/O Pin – 40ma
NodeMcu	ESP-8266 32-bit, Operating Voltage- 3.3V, Input Voltage- 4-10V, Flash memory- 4 MB/64 KB
Development Platform	IA-32, x86-64, ARM.
Language Used	Arduino C++
Code development	Arduino Software

V. ADVANTAGES.

A. It can optimize water levels as per soil moisture and weather predictions with the help of moisture sensors.
B. It can determine when a farm/land needs to be watered based on local weather data.
C. It will help you to have better control on your landscape and irrigation needs.
D. It will save a substantial amount of money on your water bills as it cuts water wastage significantly.

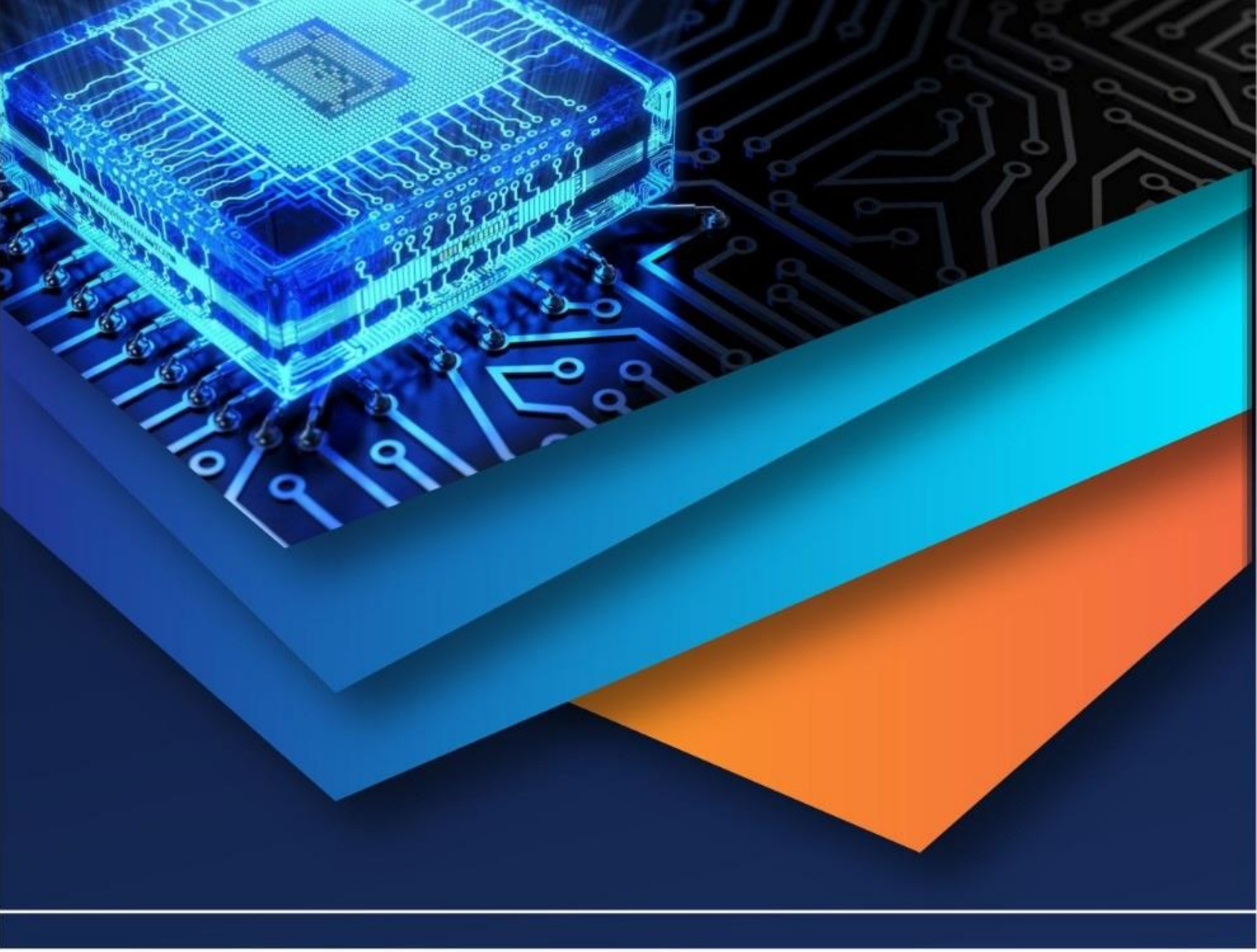
VI. CONCLUSION

The soil moisture is a critical parameter for developing a smart irrigation system. The soil moisture is affected by a number of environmental variables, e.g., air temperature, air humidity, UV, soil temperature, etc. With advancement in technologies, the weather forecasting accuracy has improved significantly and the weather fore- casted data can be used for prediction of changes in the soil moisture. This paper proposes an IoT based smart irrigation architecture along with a hybrid machine learning based approach to predict the soil moisture.

REFERENCES

[1] Abdullah, S. A. Enazi and I. Damaj, "AgriSys: A smart and ubiquitous controlled-environment agriculture system," 2016 3rd MEC International Conference on Big Data and Smart City (ICBC), Muscat, 2016, pp. 1-6.
[2] Gheith, R. Rajamony, P. Bohrer, K. Agarwal, M. Kistler, B. L. W. Eagle, C. A. Hambridge, J. B. Carter, and T. Kaplinger, Ibm Bluemix mobile cloud services, IBM Journal of Research and Development, vol. 60, no. 2-3, pp. 7:17:12, March 2016.
[3] Lage and J. C. Correa, Weather station with cellular communication network, in 2015 XVI Workshop on Information Processing and Control (RPIC), Oct 2015, pp. 15.
[4] A.V. Bossio and M. P. Cadeddu, Rain detection from ground- based radiometric measurements: Validation against rain sensor observations, in 2015 IEEEInternational Geo-science and Remote Sensing Symposium (IGARSS), July 2015, pp. 23232326.
[5] ArduinoAvailable:http://www.arduino.cc/download/
[6] Goldstein, A., Fink, L., Meitin, A., Bohadana, S., Lutenberg, O., Ravid, G., 2017. Applying machine learning on sensor data for irrigation recommendations: revealing the agronomists tacit knowledge. Precis. Agric. 19, 421 444.https://doi.org/10.1007/s11119-017-9527-4.

[7] G. M. Salim, H. Ismail, N. Debnath, and A. Nadya, Optimal light power consumption using LDR sensor, in 2015 IEEE International Symposium on Robotics and Intelligent Sensors (IRIS), Oct 2015, pp. 144148.
[8] H. Saini, A. Thakur, S. Ahuja, N. Sabharwal, and N.Kumar, Arduino based automatic wireless weather station with remote graphical application and alerts, in 2016 3rd International Conference on Signal Processing and Integrated Networks (SPIN), Feb 2016, pp. 605609.
[9] Corporation, Ibm-blue-mix [Online] Available: https:// www.ibm.com/cloud- computing/bluemix/
[10] Jaguey, J.G., Villa-Medina, J.F., Lopez-Guzman, A., Porta-Gandara, M.A., 2015.Smartphone irrigation sensor. IEEE Sens. J. 15, 5122 5127.https://doi.org/10.1109/JSEN. 2015.2435516.
[11] Mean Squared Error [WWW Document], 2018. Tutor vista (accessed 8.29.18). https://math.tutorvista.com/statistics/ mean- squared-error.html.
[12] M.H. Asghar, A.Negi, and N. Mohammadzadeh, Principle application and vision in internet of things (IoT), in International Conference on Computing, Communication Automation, May 2015, pp. 427431.
[13] N. Putjaika, S. Phase, A. Chen-Im, P. Phunchongharn and K. Akkarajitsakul, "A control system in an intelligent farming by using arduino technology," 2016 Fifth ICT International Student Paper Conference (ICT-ISPC), Nakhon Pathom, 2016, pp. 53-56.
[14] Pandey, V.S., Sharma, D., Shukla, A.K., Tyagi, S., 2017. A low-cost zigbee based temperature and humidity acquisition system for research and industrial applications. In: Dutta, C.R.K.S.D.K. (Ed.), International Conference on Communication Computing and Networking, pp. 379385.
[15] R. H. Budi Setiyono, Sumardi, Measurement system of temperature, humidity and air pressure over 433 Mhz radio frequency: An application on quadrotor, October 2015.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY