ISSN 2278-3091
Volume 9 No.2, March -April 2020
International Journal of Advanced Trends in Computer Science and Engineering
Available Online at http://www.warse.org/IJATCSE/static/pdf/file/ijatcse28922020.pdf
https://doi.org/10.30534/ijatcse/2020/28922020

Smart Irrigation and Agriculture Monitoring system using Cloud Server based on IOT

Sumathi K [1], Adchaya P[2], Jayasri M[3], Nandhini B[4], Pavithra J T[5]
[1]Department of CSE, M.Kumarasamy College Of Engineering, India, thirusumathi83@gmail.com
[2]Department of CSE, M.Kumarasamy College Of Engineering, India, adchayankl15@gmail.com
[3]Department of CSE, M.Kumarasamy College Of Engineering, India, jayasrimurugesan99@gmail.com
[4]Department of CSE, M.Kumarasamy College Of Engineering, India, nandhinibemkce@gmail.com
[5]Department of CSE, M.Kumarasamy College Of Engineering, India, pavisrisubramaniam@gmail.com

ABSTRACT

The technology used in horticulture sector is fetching surplus everyday. The main goal concerning this paper is the farmer will be able to monitor and control irrigation by using a smart phone or pc from anywhere at any time, to monitor the water parameter and reduce his efforts also to optimize the use of water. the measured value of sensor driven to cultivator wound up the WiFi router and the yield setup contrived through android application. The peculiar sensors are worn in this ideology. The sensors furnish and communicate towards Arduino. The scrutinizer transmit the information directed towards cloud server.

Key words : IOT, Cloud Computing, Android, Irrigation System, Sensors, Arduino.

1. INTRODUCTION

Massive amount of yield were eradicated owing to unperceived climate predicament. It includes immense number pertaining to yield blemished due to less replenishment of water. This ideology uses embedded based technology pertinent to cultivators at less amount. This irrigation entity detect the moistness and climate departure throughout the yield that furnishes the motor ON/OFF conditions. Using this entity to deflect human correction and scrutinize the moistness. The main objective of the work is to achieve a technological solution based on IoT and Arduino to facilitate the task of monitoring plant, control the irrigation process, to A thing speak channel is created and connected to Arduino by using the esp8266 Wifi module to sending and receiving data using the cloud, where the user can access the channel via user name and password to remotely monitor and control. IOT indicates to the physical object that appearance an IP address for internal connectivity and the communication that is established between the objects and the other devices .

2. LITERATURE SURVEY

In this paper, the wireless detector system used in horticulture will trail to agriculture farming society to exchange a standard methods. The agriculture increases the crop production and the saves labour cost and protect the environment from pesticide and fertilizers. The parameters includes temperature, humidity, soil moisture, leaf wetness and atmospheric pressure sensors to be integrated in all nodes[1].

The main purpose of this paper is to find moisture level and switch relay manipulation the solenoid valve allowing to the fundamentals. This system uses python programming for controlling the entire system. It users soil moisture sensor to measure the amount of moisture in soil. The Raspberry Pi is supplied with 5V to control the system[2].

This ideology was signified new knowledge and communication technology (ICT) advancements. Automatic management options with the latest electronic technology mistreatment microcontroller that turns the pumping motor ON and OFF on detective work the moistness content of the world and GSM telephone circuit is planned when activity the temperature, humidity, and soil wetness[3].

In this proposed system, the sensor node provides low-power communication. It helps to estimate the network. The energy and worth were used for interpretation of networks. In this network it consist of sink nodes and gateway depending on network topology. The sink receive data from sensor nodes and send the data to server. In wireless network the sink is in active state and thus saves more power[4].

In this paper, they used MLP and RBF to find soil moisture, ELM to find soil temperature, SVM to find condition of soil KNN to find dryness of the soil. Using think speak channel , we built the IOT application and also representing the data in the form of chart. The plugins and apps are creator for proving web services and other API[5].

In this paper, they used sensors like temperature, soil moisture, humidity sensors. This sensor will sense a different

parameter of the soil. By using the value of soil moisture the motor will ON/OFF automatically. The central processing unit includes communication device for collecting data from sensors It can be done using a Wi-Fi module. The user can see the data using mobile phone or tablet. The mobile application of the user receives the data from an IP address[6].

3. COMPONENTS

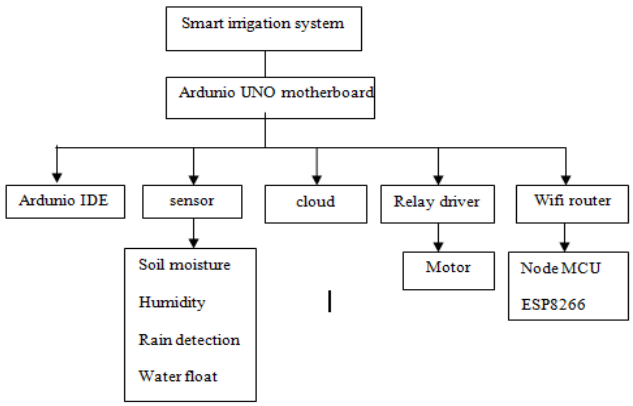

Figure 1: Block Diagram For Smart Irrigation

3.1 Arduino UNO

Arduino takes a look at complicated science merchandise. It is simple in writing program. It act as a interface between hardware and software factors. In Arduino UNO consist of 14 digital input and output pins. The sensor values are initialized to A0,A1 and A2 and its corresponding temperature moisture and humidity are measured.

3.2 Soil moisture Sensor

The soil moisture sensor is an analog sensor used to pitch moisture content in the soil. this sensor is worn for irrigating the field with water and provide accurate measurements. Soil moisture depends upon substantial factors includes soil type, temperature. It depends upon the need of moisture level of certain crops and also measure the moisture content in the soil.

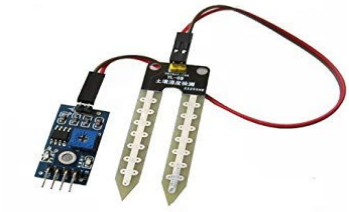

Figure 2: Soil Moisture Sensor

3.3 Humidity Sensor

Humidity is that the quantity of vapor within activated the molecular turbulence causes lightweight to be scattered all told directions and therefore the cell seems to be bright. It sense both temperature and moisture. It consists of three basic sensors namely capacitive, resistive and thermal.

3.4 Rain Detection Sensor

This sensor is an apparent device for rain detection. It helps to find the rainfall intensity. Using this method we can intensify the level of ground water. The rain sensor comprise of nickel coated lines and it entirety on the resistance principle.

Figure 3: Rain Detection Sensor

3.5 Float Sensor

The float sensor is used to recognize the surface of water interior the tank. This sensor worn to oversight the pump. Magnetic float sensor it subsist of electromagnetic ON/OFF switch. This sensor is fixed in the well. If the level of water is below the fixed level then the motor will turn on automatically.

Figure 4: Water Float Sensor

3.6 NodeMCU

NodeMCU is an IOT platform which bound on the ESP8266 Wi-Fi. It refers to firmware and prototyping board. In this operation lua scripiting language is used. NodeMCU possess features such as Wi-Fi capability, analog pins, digital pins and the serial communication protocol.

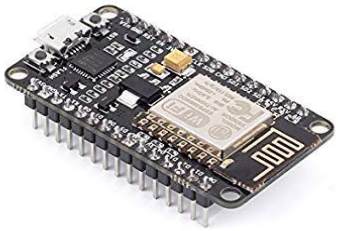

Figure 5: NodeMCU

3.7 Arduino IDE

Arduino IDE is used to write the program in C and C++ programming language. This helps to convert the executable code into a text file and also loaded into Arduino board. It accommodate a text editor for writing code, message area. It checks the error and also we can make changes wherever possible. Using USB port we can able to dump the code in Arduino UNO. It consist of toolbar button that allowing to create , save, open and upload the program.

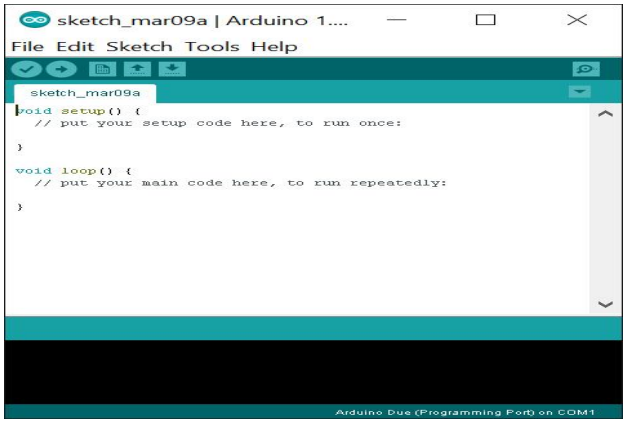

Figure 6: Arduino IDE

3.8 Embedded C

Embedded C is also like that C programming language. Mostly this embedded C helps to design the Iot projects. It helps to write the program for hardware devices. Embedded software concede hardware to monitor both input and output. It directly wield the intrinsic architecture of embedded hardware. there are many languages used for embedded systems namely assembly language, C++, JAVA, C, JAVA script etc.

3.9 Proteus simulation

It is a software suite containing schematic, simulation in conjunction with PCB designing. ISIS is the software program used to induce schematics and simulate the circuits in real-time. The simulation permits human access throughout run time. It helps to find how the connection is established between the components. Using this simulation we can easily predict the error connection. it is easy to identify the components used in circuit connection.

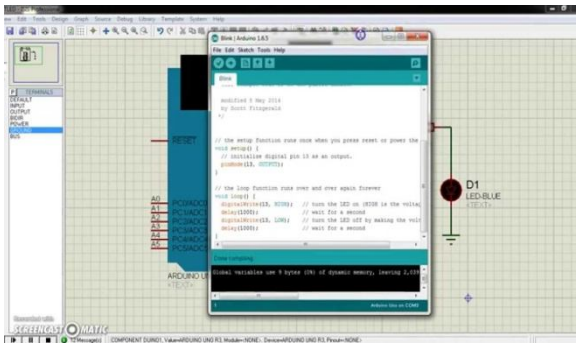

Figure 7: Proteus Simulation

3.10 Cloud server

The cloud server act as a platform to store the data for future purpose. It is used to retrieve the data when internet is accessible. The measured value from the sensor are stored in cloud for future access. This cloud server helps to many organization to store data. Cloud server having certain limits to store the data. If you want to store huge amount of data then we can pay and use it. It helps store the history of data.

Figure 8: Cloud Server

4. CONCLUSION

The ideology affords high-quality option to the issues faced inside the existing guide process of irrigation with the aid of enabling green usage of water resources. The proposed systems explore how the horticulture sector is used in IoT. the effective use of water pump is done. It includes low value, low strength consumption of devices, a higher selection making system. WiFi enabled paperwork collecting statistics to carry out in a manner to be able to reduce the quantity of water wasted in irrigation and also reduces monetary price for farmers.

5. REFERENCES

1. N.Sakthipriya, **An Effective Method for Crop Monitoring Using Wireless Sensor Network,** Middle-East Journal of Scientific Research 20 (9): 1127-1132, 2014, pp.1-6.
2. K K Namala, Krishna Kanth Prabhu A V,Anushree Math,Ashwini Kumari,Supraja Kulkarni, **Smart Irrigation with Embedded System,** 2016 IEEE Bombay Section Symposium (IBSS), pp.1-5. https://doi.org/10.1109/IBSS.2016.7940199
3. Yuthika Shekhar, Ekta Dagur, Sourabh Mishra, Rijo Jackson Tom and Veeramanikandan. M, **Intelligent IoT Based Automated Irrigation System,** International Journal of Applied Engineering Research ISSN 0973-4562 Volume 12, Number 18 (2017) pp. 7306-7320.
4. Soumil Heble, Ajay Kumar, K.V.V Durga Prasad, Soumya Samirana, P.Rajalakshmi, **A Low Power IoT Network for Smart Agriculture,** Indian Institute of Technology, 2011, pp.1-5.
5. P.Roopa Ranjani and Gvnsk Sravya, IOT **Based Smart Irrigation System,** International Journal Of Research, Volume 05 Issue 12 April 2018, pp.1-7.
6. Pavankumar Naik, Arun Kumbi, Kirthishree Katti, Nagaraj Telkar, **Automation Of irrigation System Using IOT,** International Journal of Engineering and Manufacturing Science. ISSN 2249-3115 Volume 8, Number 1 (2018), pp. 77-88.
7. P. Lottes, R. Khanna, J. Pfeifer, R. Siegwart and C. Stachniss**, UAVbased crop and weed classification for smart farming,** 2017 IEEE International Conference on Robotics and Automation (ICRA), pp. 30243031, 2017. https://doi.org/10.1109/ICRA.2017.7989347
8. Novi Azman, Mohd Khanapi Abd Ghani , Sandy Rachmat Wicaksono , Lizawati Salahuddin, **The Development of IoT Tele-Insomnia Framework to Monitor Sleep Disorder,** International Journal of Advanced Trends in Computer Science and Engineering, Volume 8, No.6, November – December 2019, pp. 2831 – 2839. https://doi.org/10.30534/ijatcse/2019/25862019
9. Siwoo Byun, **Gateway-based Resource Control for Reliable IoT Environments,** International Journal of Advanced Trends in Computer Science and Engineering, Volume 8 No.5, September - October 2019, pp.1881 – 1885**.** https://doi.org/10.30534/ijatcse/2019/11852019
10**.** Dr.K.Sumathi, **S**oundarya S, 2019, **Adaptive Clock Synchronization In Wireless Sensor Networks Using Pi Method**, Intelligent Computing Research Studies in Life Science ISSN 2250 – 0480, Volume SP-06/SP-5/32-39.
11. K.Sumathi ,Dr.M.Venkatesan,2015, **Identification of packet droppers in wireless sensor networks using a novel algorithm**, International Journal of Applied Engineering Research, ISSN 0973-4562, Vol. 10 No.38 /2015/ 28548-28552.
12. K.Sumathi ,Dr.M.Venkatesan, 2016, **Trust based detection of malicious nodes in wireless sensor networks**, International Journal of Advanced Research in Computer Engineering & Technology,Volume 5 Issue 2/2016/378-381.
13. K.Sumathi ,Dr.M.Venkatesan, 2016, **A Survey on congestion control in WSN**, International Journal of Computer Applications, Volume 147(6)/2016/6-11. https://doi.org/10.5120/ijca2016911115
14. K Sumathi, P Pandiaraja 2019," **Dynamic alternate buffer switching and congestion control in wireless multimedia sensor networks**" , Journal of Peer-to-Peer Networking and Applications , Springer,2019.
15. P.RajeshKanna and P.Pandiaraja 2019," **An Efficient Sentiment Analysis Approach for Product Review using Turney Algorithm**", Journal of Procedia Computer Science , Elsevier ,Vol 165 ,Issue 2019, Pages 356-362. https://doi.org/10.1016/j.procs.2020.01.038
16. . S.Sravanan , T.Abiramai , and P.Pandiaraja 2018, '**Improve Efficient Keywords Searching Data Retrieval Process in Cloud Server** ", 2018 International Conference on Intelligent Computing and Communication for Smart World (I2C2SW) .PP 219 -223.
17. P.Pandiaraja & Vijayakumar, P 2017, **'Efficient multi-keyword search over encrypted Data in untrusted cloud environment**", Proceedings of the 2nd International Conference on Recent Trends and Challenges in Computational Models (ICRTCCM '17), pp :251-256. https://doi.org/10.1109/ICRTCCM.2017.54
18. S.Thilagamani, N.Shanthi, "**Literature survey on enhancing cluster quality**", International Journal on Computer Science and Engineering Vol. 02,No. 06, 2010,pp1999-2002.