NavaJyoti, International Journal of Multi-Disciplinary Research
Volume 5, Issue 2, Feb 2021

IOT BASED AUTOMATIC IRRIGATION SYSTEM

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ABSTRACT

India is mainly an agricultural country. Agriculture is the most important occupation for the most of the Indian families. Water is main resource for Agriculture. Irrigation is one method to supply water but in some cases there will be lot of water wastage. So, in this regard to save water and time we have proposed paper titled automatic irrigation system using IOT. In this proposed system we are using various sensors like temperature, humidity, soil moisture sensors which senses the various parameters of the soil and based on soil moisture value land gets automatically irrigated by ON/OFF of the motor. These sensed parameters and motor status will be displayed on user android application.

Key Words: Node MCU E-12, Arduino IDE 1.8.13, Blynk app, KNN algorithm and Repl.it tool.

1 INTRODUCTION

The IOT is stands for internet of things, India's major source of income is from agriculture sector and 70% of farmers and general people depend on the agriculture. In India most of the irrigation systems are operated manually. These techniques are replaced with semi-automated and automated techniques. An automated irrigation system was technology in low cost which is usable by Indian farmers. In India people mainly depend on agriculture in villages plays an essential role in developing the country. Basically, agriculture depends on the monsoons which have not enough water source. To overcome this problem the irrigation system is employed in the field of agriculture. In this system, based on the soil type, the water will be provided to the agricultural field. Water management is paramount in countries with water scarcity. This also affects agriculture, as a large amount of water is dedicated to that use. The possible consequences of global warming lead to the consideration of creating water adaptation measures to ensure the availability of water for food production and consumption. Thus, studies aimed at saving water usage in the irrigation process have increased over the years in agriculture, there are two things, namely, the moisture content of the soil as well as the fertility of the soil. At the present time, there are several types of techniques available for irrigation to reduce the need for rain. This type of technique is driven by on/off (water pump) schedule using electrical power. This article discusses the implementation of a automatic irrigation system using IOT.

IOT (Internet of Things) the Internet of Things is the inter-networking of “physical devices” also referred to as "connected devices" and "smart devices”. Sometimes referred to as the Internet of Everything (IOE) and Machine to Machine (M2M) communicating. IOT is expected to offer advanced connectivity of devices, systems, and services that covers a variety of protocols, domains, and applications.

2 LITERATURE REVIEW

In paper [1] In this paper, soil moisture sensor, temperature and humidity sensors placed in root zone of plant and transmit data to android application. Threshold value of soil moisture sensor that was programmed into a microcontroller to control water quantity. Temperature, humidity and soil moisture values are displayed on the android application. System sends the values to mobile application. This proposed paper is Arduino based remote irrigation system developed for the agricultural plantation, which is placed at the remote location and required water provides for plantation when the humidity of the soil goes below the set-point value.

In paper [2] This paper on "Automatic Irrigation System on Sensing Soil Moisture Content" is intended to create an automated irrigation mechanism which turns the pumping motor ON and OFF on detecting the dampness content of the earth. In this paper only soil moisture value is considered but proposed project provided extension to this existed project by adding temperature and humidity values. Remote Monitoring in Agricultural Greenhouse Using Wireless Sensor and Short Message Service (SMS).In this paper they are sending data via sms but proposed system sends the values to mobile application.

In paper [3] .IoT can construct agricultural and farming processes more efficient by tumbling human intervention through automation. In agriculture, irrigation is one of the processes which support crop production by supplying needed water to the soil. The irrigation methods involve a lot of time and effort in farming. A Sensor-based automated irrigation system provides a promising solution to manage agricultural activity. This research article provides a vast study on the irrigation system in smart agriculture.

In paper [4] the aim of this research paper is to make agricultural process easy and convenient. Automatic systems are used instead of traditional methods. Irrigation is vital for sustenance of mankind but simultaneously it is very tedious and time consuming. By introducing advanced systems, this process can become better. There is already a shortage of water sources and hence it becomes essential for mankind to save it. This proposed system consumes the least amount of water required for crops, thus saving it. This paper proposes a system which does not require physical presence of people in the field by controlling the farming process with the help of a smart phone.

In paper [5] this research paper is all about process needs of soil environmental monitoring system and analyzing those problems with existing monitoring system; we implemented a wireless sensor network based on the soil moisture level monitoring system to control the water flow available on the pipe. This system can rapidly realize the automatic networking irrigation system, transmission and display. Through the technologies and Web Services technology, we can realize the function of remote monitoring and the retrieved sensor details are updated via web technology. It shows that the system can meet the requirements of the moisture level of the soil and water flow level for the agricultural field monitoring and the updated information will be available on the webpage.The user can anytime view their sensor data details and the intimation about the water flow level will be sent via SMS to the users mobile phone.

In paper [6] Automated Irrigation System using WSN and GPRS Module- Crop Monitoring System based on WSN - Automatic Drip Irrigation System using WSN and Data Mining Algorithm.

In paper [7] the proper utilization of water needs to be considered as most urgent issue in the current scenario of water decreasing and drying up of rivers and tanks. To come across from this issue the use of sensors such as temperature and moisture at appropriate locations for monitoring the crops implemented. An algorithm developed and implemented with threshold values. The threshold values are applied in the temperature and soil moisture by using micro controller based gateway to monitor water quantity. The system can be powered and have communication link on cellular interface that allows data monitoring and irrigation scheduling through a web page.

3 PROBLEM STATEMENT

- The economy of many countries depends on agriculture.
- This project looks into developing an automated irrigation system that could be controlled through mobile application.
- This system will work to minimize the number of workers in a crop field, control and save water and electricity.
- All these features make this research sustainable option to be considered to improve the agriculture and irrigation efficiency.
- The main aim of this project is to generate an intelligent irrigation system that measures the moisture of soil and helps to take the decision to turns on or off the water supply
- The aim of this project is to mainly reduce human work and to save the water and environment.

4 METHODOLOGY

KNN ALGORITM

The model for KNN is the entire training dataset. When a prediction is required for an unseen data instance, the KNN algorithm will search through the training dataset for the k-most similar instances. The prediction attribute of the most similar instances is summarized and returned as the prediction for the unseen instance. The similarity measure is dependent on the type of data. For real-valued data, the Euclidean distance can be used. Other types of data such as categorical or binary data, Hamming distance can be used. In the case of regression problems, the average of the predicted attribute may be returned. In the case of classification, the most prevalent class may be returned.

LEVEL 1

- NodeMCU,5V relay and Moisture sensor are connected together and using with data cable I will send the code to the nodemcu with pc.

- The Arduino IDE is tool for the programming with hardware components it will display the moisture level is low or high in the Mobile.

- If the moisture sensor is low then it will send the notification to Blynk Application and also to the Email. This will help to find out the moisture level of the soil.

LEVEL 2

- Tools used - reppl.it, jupyter.

- Web-site- Kaggle Here first of all, I make an IOT model. After collecting the data from a model. I apply machine learning algorithms to find how much soil dry and check or compare Machine Learning K-NN Algorithm.

5 EXPERIMENTS AND RESULTS

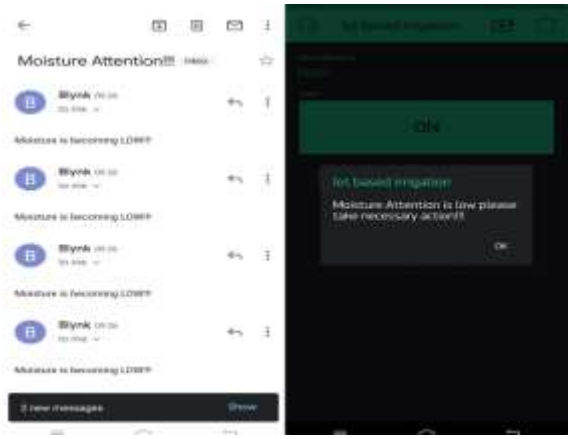
Blynk_IOT | Arduino 1.8.13

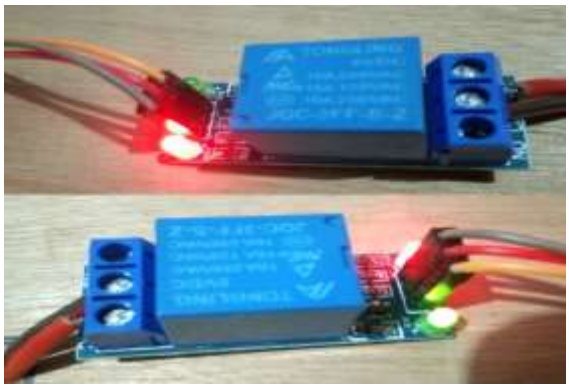
File Edit Sketch Tools Help

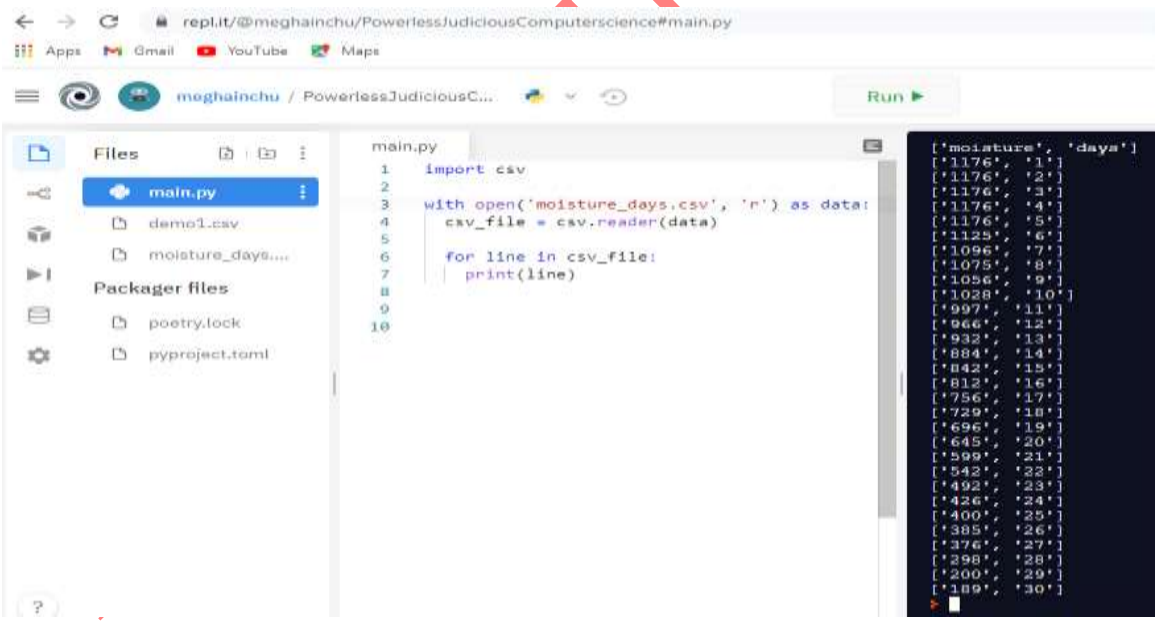
Blynk_IOT

```
#define BLYNK_PRINT Serial
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>

char auth[] = "SLE-EpNvZkusPVRLvRrF0Aplip66UGx6";
char ssid[] = "Meghana";
char pass[] = "meghana7";

void setup()
{
  Serial.begin(115200);
  Serial.println(digitalRead(D0));
  pinMode(D1,OUTPUT);
  digitalWrite(D1, HIGH);
  Blynk.begin(auth, ssid, pass);
}

void loop()
{
  if(digitalRead(D0) == HIGH)
  {
    Blynk.email("meghanam038@gmail.com", "Moisture Attention!!!", "Moisture is becoming LOW!!!");
    Blynk.notify("Moisture Attention is low please take necessary action!!!");
  }
  digitalRead(D0)== LOW;
  Blynk.run();
}
```

Done Saving.


Moisture Attention!!!
Moisture is becoming LOW!!!
2 new messages
Show
OK
IoT based Irrigation
Moisture Attention is low please take necessary action!!!
OK

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Apps
Gmail
YouTube
Maps
meghainchu / PowerlessJudiciousC...
Run
Files
main.py
demo1.csv
moisture_days....
Packager files
poetry.lock
pyproject.toml
main.py
1 import csv
2
3 with open('moisture_days.csv', 'r') as data:
4 csv_file = csv.reader(data)
5
6 for line in csv_file:
7 print(line)
8
9
10
['moisture', 'days']
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6 CONCLUSION

The main objective of this smart irrigation system is to make it more innovative, user friendly, time saving and more efficient than the existing system. Due to server updates farmer can know about crop field nature at anytime, anywhere. The primary application of this work is for farmers and gardeners who do not have enough time to water their Crops/plants. This project presents the design of an IoT based automatic irrigation system. The proposed system can reduce the efforts of farmers and provides high yield. The main objective of this smart irrigation system is to make it more innovative, user friendly, time saving and more efficient than the existing system. Due to server updates farmer can know about crop field nature at anytime, anywhere.

7 REFERENCES

- Rane, et al - .,"Review Paper Based On Automatic Irrigation System Based on RF Module" 2014
- Archana and Priya,- ”Design and Implementation of Automatic Plant Watering System” presented at International Journal of Advanced Engineering and Global technology , vol-04, Issue-01 , Jan-2016.Sonali.
- D.Gainwar and Dinesh.V.Rojatkar ,-“Soil Parameters Monitoring with Automatic Irrigation System” presented at International Journal of Science, Engineering and Technology Research(IJSETR),vol-04,Issue 11,Nov 2015.
- R. Vagulabranam, M. Karthikeyan “Automatic Irrigation System On Sensing Soil Moisture Content” International Research Journal Of Engineering & Technology (IRJET) ISSN: 2395-0056Prof. Rashmi Jain, Shaunak Kulkarni, Ahtesham Shaikh, Akash Sood, “ Automatic Irrigation System For Agriculture Field Using Wireless Sensor Network”, International Research Journal Of Engineering & Technology (IRJET) ISSN: 2395-0056
- Anurag D, Siuli Roy and SomprakashBandyopadhyay, “Agro-Sense: Precision Agriculture using Sensor-based Wireless Mesh Networks”, ITU-T “Innovation in NGN”, Kaleidoscope Conference, Geneva 12-13 May 2008.
- C. Arun, K. Lakshmi Sudha “Agricultural Management using Wireless Sensor Networks – A Survey”2nd International Conference on Environment Science and Biotechnology IPCBEE vol.48 (2012) © (2012) IACSIT Press, Singapore 2012.