INTERNET OF THINGS (IOT) BASED
SMART IRRIGATION

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Abstract

This work is primarily about the improvement of current agricultural practices by using modern technologies for betterment of agriculture and modernization the traditional agriculture system.

Internet of Things(IoT) plays a crowning role in smart agriculture. The project will help root level farmers to get into smart irrigation in term of agriculture. Which provide greater service in less cost in irrigation and lowest man power. Smart irrigation is an empirical concept because IoT sensors capable of providing information about their agriculture fields and making irrigation automated by Internet of Things. The feature of this paper includes monitoring temperature, humidity, and water level in agricultural field through sensors. The data from sensors are sent to Web server database using wireless transmission. Controlling of all these operations will be through any remote smart device or computer connected to internet and rain condition is also applied to the operations. It will be performed by interfacing sensors, Smart agriculture app, Wi-Fi module.

INTRODUCTION

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 system are operated manually. These outmoded techniques are replaced with automated techniques. The available traditional techniques are like ditch irrigation, terraced irrigation, drip irrigation. The global irrigation scenario is categorized by increased demand for higher agricultural productivity, poor performance and decreased availability of water for agriculture. These problems can be appropriately rectified if we use automated system for irrigation.
LITERATURE REVIEW

In this paper, there is a monitoring system where data gathered by the sensors to computer by Wi-Fi module and upgrade information about the water assets, soil quality. It focuses on monitoring some parameters of a greenhouse agriculture field and control the specific parameters by using Bluetooth module. It aims at creating agriculture smart access of temperature, soil moisture and relative humidity information by using DHT11 and transfers data to cloud server for remote access. From this paper, details about parameters such as humidity and temperature values are uploaded to the website using the Arduino microcontroller at regular interval of time through ESP8266 Wi-Fi module. The most important feature of this paper, all the information about the field condition through sensors is sent on the farmer mobile application using Wi-Fi Relay Module and automatically control the water supply.

METHODOLOGY

This project is run under the input of several number of sensors which up next processed by Raspberry Pi and by the condition of this project. Firstly, moisture sensor will have to sense the condition of the soil. Soil may be in dry or watery. This sensor is adjacent to water. When the dry level of the soil is high in such a condition the pump will be automatically on and this information is saved and stored in the free server Altair Smart core and in the meantime the user will get the information about the pump on condition and the information of temperature and humidity of the land which will be gotten by the temperature and humidity sensor.
**Component used**

**NodeMCU**

NodeMCU is an Internet of Things (IoT)-focused open-source Lua-based firmware and development board. It includes software for Espressif Systems’ ESP8266 Wi-Fi SoC as well as hardware for the ESP-12 module. The major argument for choosing this is that it is cheap and includes a built-in Wi-Fi module[10]. Because it is similar to Arduino, it can be programmed using the Arduino IDE software. It has ten General Purpose Input/Output pins for connecting to external devices. A standard NodeMCU, complete with pin numbers.

**Soil Moisture Sensor**

The Soil Moisture Sensor is a straightforward breakout for determining the moisture content of soil and other similar materials. The soil moisture sensor is simple to set up and operate. The sensor’s two big exposed pads serve as probes, and combined they operate as a variable resistor. The greater the amount of water in the soil, the better the conductivity between the pads will be, resulting in a lower resistance and a larger SIGout. It’s commonly used in greenhouses to regulate water supply and other bottle enhancements. Experiments in biology to track the amount of water in the soil.

**Relay**

Within a relay, there is a core with copper wire wrapped around it (the coil). Under normal conditions, the switch (armature) remains in contact with the normally closed (NC) terminal. An electromagnetic field is generated when power is applied to the coil, and the coil begins to function as a magnet, attracting the armature to the normally open terminal (NO). At their most fundamental level, relays are nothing more than that. Aside from that, there are a variety of other types of relays, such as solid state and thermal relays, all of which have distinct functioning processes but serve the same purpose. This portion is used to regulate the small dc pump, which is used to water the plants automatically, and the flow is regulated by a relay. Relays are used to switch control circuits that handle lower currents. Furthermore, it can manage even greater voltages and amperes with the assistance of amplification.
DHT 11

The dht11 sensor, which combines a temperature and humidity sensor, typically outputs either digital or analog data. It contains information about the temperature around the plant if it needs extra sunshine and the degree of humidity in the surrounding environment. Water vapor is detected by measuring the electrical resistance between the two electrodes. The humidity sensing component consists of the electrode and the substrate, which is responsible for retaining moisture while in contact with the surface. Ions are released by the substrate. The conductivity between the electrodes rises as soon as water vapour is absorbed by it. The calibration result of the dht11 sensor is quite accurate. Because of its small size and low power consumption, the DHT11 sensor has a wide range of uses. It can also transmit signals over a distance of up to 20 meters. The product we used was a four-pin single row pin box.

Blynk APP

Blynk is a platform that allows you to control Arduino, Raspberry Pi, and other devices via the Internet using IOS and Android applications. It’s a digital dashboard where you may drag and drop widgets to create a graphic interface for your project. Blynk is a programme that allows you to create your own apps. It can be applied to a single project or a number of them. Virtual LEDs, buttons, value displays, and even a text terminal, as well as the ability to interact with one or more devices, may be incorporated in any project.
CONCLUSION AND FUTURE WORK

Our intention of this research work was to establish a flexible, economical, easily configurable and most importantly, a portable system which can solve our water wastage problem. It is a robust system and small in size.

Our proposed system for water level monitoring comes under the field of Internet of Things (IoT). Nowadays water level monitoring is vital in many industries too like oil and automotive etc. Using our smart system, we can analysis the usage and also detect the leakage in the tanks of these industries. In future this project can be implemented adding quality sensor and so on. That can give information about the soil which is less fertilize and how fertilize by using compost and which exact fertilizer has to use will be notified.

Reference


