SMART IRRIGATION SYSTEM

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ABSTRACT

Our project is specifically related to the IOT based Smart Irrigation System. The Irrigation system is automatically controlled by sensors and android mobile. The objective of this project is to make easy for the farmer to cultivate the farm in easy way and get more profit in less time. The result of the design will allow the farmer which have no time to go multiple times to their farm and it also reduce the wastage of water. It gives the farmer new approach by which the farmers can easily farming and their problem can be solved by using IOT through the sensors.

Keywords: Sensors, Farmer, Android Mobile

INTRODUCTION

In this project we are using IOT, but many of the farmers who needed for smart work are satisfied with it, few farmers are find difficulty for control the sensor through the android mobile app. This project is been designed for low class family as well as for the biggest farmer which have the thousands of land they can also use this project by their mobile phone using the IOT. They can see their moisture level of soil and whether the need of water to the soil by the help of IOT in their mobile phone.

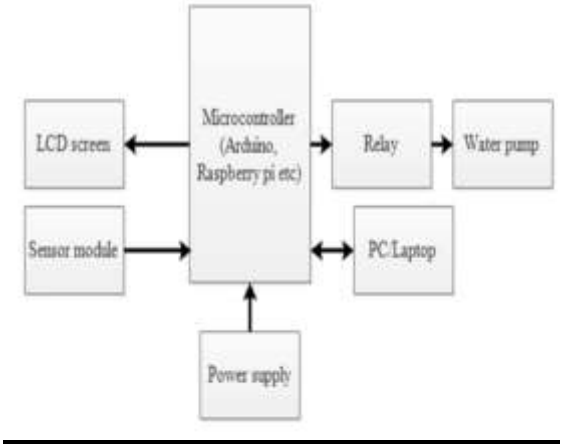
By the help of temperature sensor they can also know the temperature and control the temperature whatever they need for the particular vegetable or fruits.

LITERATURE SURVEY

A remote quantification and control system for green house predicated on Global System for Mobile GSM-SMS was proposed by Jinling et.al which sends the status of the temperature and sultriness of the green house through SMS and by remote machines, the contrivances are controlled to water the plants utilizing sensors and automated contrivances [1]. Gautam and Reddy proposed an innovative GSM Bluetooth predicated remote controlled embedded system for irrigation [2]. Suresh et.al has proposed architecture predicated on the capabilities of current and next-generation microcontrollers and their application requisites [3]. Microcontroller utilized for the system is promising that it can increment system life by decreasing the puissance utilization resulting from lower power consumption. Kansara et.al has proposed astute irrigation system utilizing IOT The scarcity of clean water resources around the globe has generated a need for their optimum utilization. Internet of Things (IoT) solutions, based on the application specific sensors' data acquisition and intelligent processing, are bridging the gaps between the cyber and physical worlds. IoT based smart irrigation systems can help in achieving optimum water-resource utilization in the precision farming landscape. This paper presents an open-source technology based smart system to predict the irrigation requirements of a field using the sensing of ground parameter like soil moisture, soil temperature, and environmental conditions along with the weather forecast data from the Internet

PROPOSED SYSTEM

Irrigation can be automated by using sensors, microcontroller, The low cost soil moisture sensor and temperature and humidity sensor are used. They continuously monitor the field. The sensors are connected to Arduino board. The sensor data obtained are transmitted through Wireless transmission and are reached to the user so that He can Control irrigation. The mobile application can be designed in such a way to analyse the data received and to check with the threshold values of moisture, humidity and temperature. The decision can be made either by the application automatically without user interruption or manually through application with user interruption. If soil moisture is less than the threshold value the motor is switched ON and if the Soil moisture exceeds the threshold value the motor is switched OFF. The sensors are connected to the Arduino board. This hardware Communicate through wireless Bluetooth transmission so that user can access the data through his mobile that has an android application which can get the sensor data from the Arduino via Bluetooth. As far as cost of device is considered Bluetooth technology is used which can be replaced by Wi-Fi. Motor is switched OFF.



WORKING OF PROPOSED MODEL

- The results of the moisture, temperature and threshold level can be calculated through the sensors used in the project.
- Analysis of soil parameters can be done and the needed nutrients
- Can be calculated for the soil. The need of water supply of the soil can be calculated and hence appropriate irrigation is done through smart techniques.

SYSTEM CONFIGURATION

This module is used to configure all hardware devices. Soil moisture sensor, Temperature and Humidity sensor, Pump all are connected to major component Arduino with Bluetooth connectivity.

Soil moisture and temperature sensing:

In this module we analyze the moisture content in the soil and its temperature. According to the sensor values further decision are taken.

COMPONENTS REQUIRED

TRANSFORMER

A transformer designed to reduce the voltage from primary to secondary is called a step-down transformer. The transformation ratio of a transformer will be equal to the square root of its primary to secondary inductance (L) ratio.

Fig 1: Transformer

WI-FI MODULE

The ESP8266 Wi-Fi Module is a self-contained SOC integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network can give any microcontroller access to your Wi-Fi network integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network protocol stack that can give any microcontroller access to

Fig 2: Wi-Fi Module

RELAY DRIVER

A relay driver circuit is a circuit which can drive, or operate, a relay so that it can function appropriately in a circuit. The driven relay can then operate as a switch in the circuit which can open or close, according to the needs of the circuit and its operation.

Fig 3: Relay Driver

SOIL MOISTURE SENSOR

Soil moisture module is most sensitive to the ambient, generally used to detect the moisture content of the soil. When the module cannot reach the threshold value, DO port output high, when the soil humidity exceeds a set threshold value, the module D0 output low;

Fig 4: Soil Moisture Sensor

TEMPERATURE SENSOR

A temperature sensor is a device used to measure temperature. This can be air temperature, liquid temperature or the temperature of solid matter. There are different types of temperature sensors available and they each use different technologies and principles to take the temperature measurement.

Fig 5: Temperature sensor

ADVANTAGES

- Ability to save water
- Smart irrigation systems can optimize water levels based on things such as soil moisture and weather predictions
- The smart irrigation controlled receives local weather data that can help it determine when a landscape should be watered
- Wide reaching.
- Save water and money
- Long term enhanced landscape health
- Protect the community's water supply for generation
- Prepare for the future of water pricing
- Make maintaining your yard easy and convenient
- Smart home integration and connectivity features

LIMITATIONS

- The primary disadvantage associated with a smart irrigation is the expense
- These systems can be quite costly depending on the size of the property
- Even the most efficient smart systems can have their pitfalls. Wind can wreak Havoc on sprinklers, directing water in the wrong direction
- Smart watering system is a bit expensive. Depending on the size of your property, you will need more
- Systems. Of course saving on water bills will lead to less cost.
- If you want to use this system for lawn watering, it's better to fix it under the ground before planting.

RESULTS

Nowadays innovations can be consolidated to let down the cost and maximize utilization of resources. Currently, farmers control irrigation method manually and irrigate their area at a systematic period. These mechanisms diminish high amount of water and the conclusion is water loss.

Fig 6: Smart irrigation System module

CONCLUSIONS

- As per future perspective, this system can be the more intelligent system
- Which predicts user actions, nutrient level of the plants, time to harvest, etc., with using Machine Learning algorithms more advancement can be done in the future which will help farmer a lot and water consumption can also be reduced in agriculture?
- This smart irrigation system is feasible and cost effective for optimizing water resources for agricultural production
- This irrigation system allows cultivation in places with water scarcity thereby improving sustainability.
- It proves that the use of water can be diminished
- The use of solar power in this system is significantly important for organic crops.

FUTURE SCOPE

- This smart irrigation system extends watering time for plants, and provides ideal growth condition.
- It saves time and timer delay as per the environmental condition can be added for automatic watering.

- This automated Smart Irrigation System using IoT is found to be cost-effective for enhancing the techniques to preserve water resources and to optimize them for agriculture production.
- This system helps the farmer by working automatically and smartly. With placing multiple sensors in the soil, water can be only provided to the required piece of land.

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