Smart Irrigation and Animal Monitoring System

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Abstract

Water is main resource for Agriculture. Irrigation is the main method to facilitate water but, in certain cases, there will be lot of water wastage. So, in this regard to save water and time we have proposed project titled smart irrigation and animal monitoring system using IoT. In this proposed system we are using various sensors which senses the various parameters of the soil and based on soil moisture value land gets automatically irrigated by ON/OFF the motor. This system is used to monitor the animal activities by restricting their entry to the agricultural land. To adapt to the changing needs and demands, we must modify the way we farm and safe guard the farm from the entry of animals. © 2020VDGOODProfessional Association. All rights reserved

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1. Introduction

Agriculture is undoubtedly India's largest provider of livelihoods. With an increasing population, there is a need for improved agricultural production. The demand for the quantity of freshwater used in irrigation is also increasing in order to support greater production in farms. Today, agriculture accounts for 83% of total water intake in India. Inadvertently, unplanned water use results in water wastage. This indicates that there is an immediate need to build systems to prevent water wastage without putting a burden on farmers. Over the last 15 years, farmers have begun to use computers and software systems to organize their financial data and track their transactions with third parties and to monitor their crops more effectively. In the age of the Internet, where information plays a key role in people's lives, agriculture is rapidly becoming a highly data-intensive industry, where farmers need to gather and evaluate a huge amount of information from a variety of devices (e.g. sensors, farming machines, etc.) in order to become more efficient in the production and communication of appropriate information. The main aim of this project was to automatically supply water to plants or gardening using a microcontroller (Arduino Uno). With the introduction of open-source Arduino boards along with low-cost humidity sensors, it is possible to build devices that can track soil moisture content and therefore irrigate fields or ecosystems as and when
required. The proposed system uses the ESP32 microcontroller on the Arduino Uno and IoT platforms, which enables farmers to remotely monitor the status of the sprinklers installed on the platform. We should just water the plants when we're on holiday or don't have to annoy my neighbours, sometimes the neighbours do too much irrigation, and the plants end up dying anyway. Timer-based devices are available in India, which waters the soil on its own interval. They do not sense the soil moisture and the ambient temperature to know if the soil actually needs watering or not. Assimilation is that artificial transfer of water to land or soil is used to assist the production of agricultural crops, the conservation of habitats and the vegetation of degraded soils in dry areas and during times of inadequate rainfall. When the zone comes on, the water flows through the side-lines and eventually ends up on the irrigation electrode (drip) or the mechanical device heads. Several sprinklers have pipe thread inlets on the lower part that allow the fitting and also the pipe to be connected to them. Sprinklers are usually used at the top of the head flush with the ground surface. As the dripping method reduces huge water losses, it has become a popular method by reducing labour costs and increasing yields. When the components are activated, all the components will read and send the output signal to the controller, and the information will be displayed to the user (farmer). The sensor readings are analog in nature so that the analog signals are converted to digital format by the ADC pin in the controller. The system will then access the information and, when the engines are turned on / off, it will be shown on the LCD panel and the serial monitor windows. There are many systems available for saving water in different crops, from basic ones to more technologically advanced ones. For example, in one method, plant watering status has been tracked and irrigation has been planned depending on the temperature of the soil content of the field.

2. Existing System

The existing system was used for accessing Sensor data for wired or RF wireless communication. The GSM module was used to transmit the data to the system. It stores the data in a web based server. In the existing model predefined interface and models are used. It makes use of a complicated kit and the cost is also very high. This system uses a microcontroller device called arduino mega 2560
where all the sensors are attached in the arduino mega 2560 using jumper wires. ESP 8266 is needed in order to connect the internet. An application named blynk is the interface and supporting software. The state of dryness and wetness for soil, humidity values and temperature values can be seen through the smartphone via the blynk application.

3. Proposed System

The Internet of Things (IoT) is a system where the operation of a computer can be tracked on a mobile device. The Internet of Things (IoT) is concerned with interconnecting networking devices that are mounted at different locations that may be distant from each other. The Internet of Things (IoT) is a sort of network technology that detects information from different sensors and makes every effort to connect to the Internet to exchange information. It can also be used to change the device's status. The central processing unit will also include a communication device to receive data from the sensors and transmit to the computer of the customer. This will be achieved by using a higher communication device, such as a Wi-Fi module. The data generated by the central node is translated into meaningful data and transmitted to the customer. The customer will display the data using a handheld device such as a mobile phone or a laptop. The shortage of water today is a major concern for agriculture. This initiative allows farmers to irrigate fields effectively with an integrated soil moisture-based irrigation system. The planned system was designed to address the excessive flow of water through agricultural land. Temperature, moisture and humidity readings shall be constantly tracked using the temperature, moisture and humidity sensor and shall be forwarded to the specified IP address. The Android program continually collects data from the allocated IP address. Once the soil moisture values have been reached the specific limit, the relay attached to the Arduino microcontroller regulates the generator. The Android app is a basic menu-driven program with four choices. It requires the motor state, moisture, temperature and humidity values. The motor status indicates the current status of the pump. The microcontroller is the system's decision-maker. This regulates the importance of moisture and temperature. Firstly, a threshold value for moisture and temperature must be established. When the perceived moisture value reaches the threshold value, the controller tests the temperature. Only when the sensed temperature value becomes greater than the threshold value, the irrigation cycle is carried out and the customer is remembered. This is because both crops will tolerate dry soil moisture if the temperature is high. This would protect the resources used for agriculture.

4. Conclusion

The application of agriculture is need of the modern agricultural development and it is also an important symbol for the future level of agricultural development. It will be the future direction of agricultural development. With more advancement in the field of IoT expected in the coming years, these systems can be more efficient, much faster and less costly. In Future, this system can be made as an intelligent system, where this system predicts user actions, rainfall pattern, time to harvest, animal intruder in the field and communicating the information through advanced technology like IoT can be implemented. So that, agricultural system can be made independent for human operation so high quality and huge quantity yield can be obtained.

References


