

SMART FARMER –IOT ENABLED SMART FARMING APPLICATION

INDRODUCTION

Agriculture is one of the most important aspect in India. Irrigation accounts for 55-70% of water usage in India. Water usage for irrigation is nearly 60%. Most of this water used is wasted. We can use soil moisture sensor as a solution for wastage of water. This is done by IoT device. The IoT networks reduce human labour requirements in the farm. IoT uses wireless sensor networks for gathering the information to monitor and control the activities. For monitoring the farm remotely, the end devices are equipped with soil moisture sensor, temperature sensor, etc. There are no means for farmers to have complete control over their farms and monitor the activity on the farm remotely. Here we try to provide a system that is cost effective and provides the functionalities that is required by the Indian farmers.

LITERATURE SURVEY

IoT devices enable all farms to be connected and share knowledge regarding farming from experienced users. The smart farm, embedded with IoT systems, can support a wide range of devices. Due to the deployment of connected farms, it can be easy to detect disease on crop or virus spread over farm using prediction technique. All sensors and actuators who are monitoring and growing the crops are connected through a gateway. The gateway is intern connected to a server called Mobius. It will communicate with expert farming knowledge system and control actuators to make farm suitable to grow crops. Prediction combined with KF: It is used to remove the noise present during communication. For prediction using KF, the nodes form a set of clusters. The cluster head will receive data from different parameters of environment from the leaf node [1].

Managing the moisture in the soil can reduce risk and deliver the production of crops effectively. RADARSAT-2 uses risk reduction strategies and soil moisture sensors in the agricultural sector. Here 5 data sets is first obtained to determine the accuracy of soil moisture in the soil. This can be done using C-B and SAR. The soil moisture mean value errors and index dataset is calculated by IEM depending on the dataset evaluated. Row direction and residue cover make it complex for calculating the moisture in the oil field [2]. The device that detects and replies to an input from any sources is called sensor. A motion sensor that uses one or more technologies to detect movement in an area. If a sensor is tripped the light floods surrounding the area and illuminates anything in it's path. Key components of a sensor nodes are analog to digital converter, transceiver, microcontroller and memory. The sensor can take various inputs using the components the input can range from various physical factor [3].

This is an information technology resource that helps farmers to tackle complex problems in crop production. The inputs for DSS are water, climate, energy, economy, and human resources and give an output of these factors, improving the production [4].

The irrigation sensor consists of a camera embedded in a waterproof and closed chamber. Camera takes image of the soil to determine the water content in it. A gray scale analysis is used to differentiate between light pixel and dark pixel. The contents are forwarded to gateway router. An app is developed on a smartphone which has computation and connectivity capabilities [5].

The system focuses on protection of the farm from rodents or insects in the field, the system provides real time notification on detecting the problem. The PID sensor is used to sense and detect animals using their body heat, we can improve and integrate this system even in the grain storage area.

We have three nodes in this system sink node, a sensor node and an actuator node. acquisition, collection and analysis of information like temperature and soil moisture is done from the sensors and the system identifies an ideal period to start the irrigation process, this saves the time and resources of the farmer, and helps us conserve water and protects the environment. We use cloud computing to deal with the high storage and processing requirements [6].

Using Raspberry Pi [7] we can advance the methods and production of crops. Our main objective is to obtain productivity of crops by minimal water consumption. Efficient ways of managing the water supplied to the crops is done by using two sensors: humidity and temperature sensors. The system made precise with cloud computing as it provides us with real time data. Here the complexity of the algorithm is reduced when compared to other algorithms.

In [8] the authors proposed a model for smart agriculture using IoT. This model has been proposed by studying the current agricultural system and its problems. This smart model enables the farmers to have the Remote Monitoring System (RMS). This is used to handle the agriculture activities remotely and also used for collecting data of agriculture in real time. This has been done by using various sensors, smartphone and Wi-Fi network. Monitoring based on WSN which make use of environment factors such as temperature, humidity etc.

To reduce the power consumption and problem of using wires for connection, the use of wired communication system is replaced with IoT technology [9]. The node, server and the database are made to communicate via Bluetooth and LPWAN.

In [10] authors have proposed the use of sensing devices in smart agriculture system. The sensors have the RF transmitter. All the sensors are connected to Arduino. Moisture Sensor used to detect soil moisture level which turns the pump on and off. Motion Sensor which is used to detect the animal intrusion and alerts the farmer via buzzer. This sensor is connected to Arduino UNO. Arduino is connected to PC using Arduino software data are monitored continuously and they are transmitted to RF transmitter.

Using sensors along with multispectral imaging [11] technology detects most of the problems in the agricultural farm. Sensors like the ultrasonic sensor to determine the growth of the crop and also detect the pests intruding the crops. The multispectral camera is a most effective way to monitor the crop. The accuracy of these technologies is commendable. Authors have proposed the reliability of smart agriculture. To improve the performance of a computer reliability of the computer is researched. The reliability of a system is effected when the sensing nodes in the system is increased. To observe the reliability of system we have to consider the no of nodes in the system. If we are using multiple systems the number of nodes in the system varies. The simulation time is

kept for desired time, then this desired period is sufficient to define a steady state of reliability of the chosen parameters the nodes send data to the server using wireless routines to eliminate connection problem we set the distance small, ideally less than 50 meter [12].

Conclusion

An agricultural system with a concept of automated irrigation using soil moisture sensors with the help of WSN can be remotely accessed via a smartphone application. Compared to traditional methods in farming, it is significant to use sensors to monitor the crops. The sensors used in the system can be maintained and is operable for the entire cultivation period by using rechargeable batteries or solar panels. For communication, capabilities such as Bluetooth or an SMS to URL or to a smartphone is used to remotely monitor the whereabouts

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