

Smart Agriculture System using Internet of Things

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Abstract: *Internet of Things (IoT) play crucial role in smart agriculture. Smart farming is an emerging concept, because IoT sensors capable of providing information about their agriculture fields. The paper aims making use of evolving technology i.e. IoT and smart agriculture using automation. Monitoring environmental factors is the major factor to improve the yield of the efficient crops. The feature of this paper includes monitoring temperature and humidity in agricultural field through sensors using CC3200 single chip. Camera is interfaced with CC3200 to capture images and send that pictures through MMS to farmers mobile using Wi-Fi. Agriculture is the primary occupation in our country for ages. But now due to migration of people from rural to urban there is hindrance in agriculture. So to overcome this problem we go for smart agriculture techniques using IoT. This project includes various features like GPS based remote controlled monitoring, moisture & temperature sensing, intruders scaring, security, leaf wetness and proper irrigation facilities. It makes use of wireless sensor networks for nothing the soil properties ,and environmental factors continuously .*

Keywords: IoT, Sensors, GPs

1. Introduction

IOT is a shared Network of objects where these objects interact through Internet. One of the important applications of IOT is Smart Agriculture. Smart Agriculture reduces wastage of water, fertilizers and increases the crop yield. Here a system is proposed to monitor crop-field using sensors for soil moisture, humidity and temperature. By monitoring these parameters the irrigation system can be automated if soil moisture is low. Irrigation is a crucial alternative to predominantly monsoon fed Indian agriculture. Due to the possible health risks behind the use of pesticides, the cost of developing new pesticides has risen at an increasingly rapid rate over recent years .Government regulations have become more stringent, slowing the rate of development and in turn increasing the cost of new products. The biggest advantage of pesticides is they are readily available and very easy to use unlike alternative method and other similar methods which can take a long while to plan and often don't have an immediate effect on. The system was studied and developed to configure of the wireless sensor network to assess the temperature, humidity and water level adjustment, and of the sensor node necessary for the optimal farming environment, and of the monitoring management devices to collect and analyze such collected data from sensor node and to store them in the management server and to alert emergency. The collected data provide the information about the various Environmental factors. Monitoring the environmental factors is not the complete solution to increase the yield of crops. There are number of other factors that decrease the productivity to a greater extent Hence automation must be implemented in agriculture overcome these problems. Though it is Implemented, in the research level it is not given to the farmers as a product to get benefitted from there sources. Hence this paper deals about developing smart agriculture.

2. Wireless Sensors Network

Wireless sensor networks represent an enabling technology for low-power wireless measurement and control applications. The elimination of lead wires provides significant cost savings as well as creating improved

reliability for many long term monitoring applications. Wireless sensor networks enable completely new capabilities for measurement and control applications. Part of the reason for that is the wireless communication itself. Instrumenting spaces to be observed or controlled with wireless networks can enable long-term data transmission at scales and resolutions that are difficult, if not impossible, to obtain otherwise. Generally, wireless sensor networks consist of a large number of densely deployed small sensor nodes with sensing, computation and wireless communication capabilities. Sensor nodes do not incorporate an infrastructure. They build up a network autonomously, without any external guidance or supervision.

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3. Literature Review

The new scenario of decreasing water , drying up of rivers and tanks, unpredictable environment, present an urgent need of proper utilization of water. To cope up with this use of temperature and moisture, sensors are placed at suitable locations for monitoring the crops. After research in the agricultural field, researchers found that the yield of agriculture is decreasing day by day. However, use of technology in the field of agriculture plays an important role in increasing the production as well as in reducing the man power . Some of the research attempts are done for betterment of farmers that provide systems which use technologies helpful for increasing the agricultural yield. The cloud computing devices create a whole computing system from sensors to tools that observe data from agricultural field and accurately feed the data into the

repositories. This idea proposes a novel methodology for smart farming by linking a smart sensing system and smart irrigation system through wireless communication technology. It proposes a low cost and efficient wireless sensor network technique to acquire the soil moisture, Humidity, temperature from various locations of field and as per the need of crop water motor is enabled. It proposes an idea about how automated irrigation system was developed to optimize water use for agricultural purposes.

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4. Proposed Work

We have seen the problem facing by farmers like water scarcity, irrigation problem like under irrigation and over irrigation, wild animal and pest attack. We also see that farmers are not able to take multi crops because of unorganized structure agriculture farm, so we need to modernize farm structure for increasing food production at peak level. Hence, we discuss advantage of step farming in plane area over hilly area. In this chapter, we will discuss how to solve such problems with the help of internet of things.

5. Conclusion

The death count and the suicidal rate of farmers [30] in India increase day by day due to the various field, farming, and water-related issues. So, by using organized fashion of field structure and proper irrigation scheduling and providing them the early danger weather condition on their mobile directly, we can save them from this kind of disaster. Now, by this technique farmers are able to produce crops in all three season effectively and losses will be minimized. So death toll ultimately decreased

6. Future Work

- 1) For the pest control, we need to use ultrasound of various frequency which. When any pest interacts with any part of the plant, then by using capacitive touch shield, we can detect the presence of pest so an alert signal is generated by the ultrasound generator.
- 2) For the supply of constant and continuous energy to the sensor, we need to set up a solar cell powered battery in the field..
- 3) To reduce the consumption of the battery, we need to set up some logic to activate the sensor network at a

particular time and other time, the sensor network remains idle.

- 4) Incorporation of small exhaust fan as a heat sink to protect the sensor devices or drive circuitry from the excess heat of the sun so, the age of the sensor devices and circuitry will increase.

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