

# **Smart Farmer - IoT Enabled Smart Farming Application**

## **Literature Survey**

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### **Design and Optimization of IoT Based Smart Irrigation System**

**H.G.C.R. Laksiri, H.A.C. Dharmagunawardhana, J.V. Wijayakulasooriya. Year: 2019.**

Development of an effective IoT-based smart irrigation system is also a crucial demand for farmers in the field of agriculture. This research develops a low-cost, weather-based smart watering system. To begin, an effective drip irrigation system must be devised that can automatically regulate water flow to plants based on soil moisture levels. Then, to make this water-saving irrigation system even more efficient, an IoT-based communication feature is added, allowing a remote user to monitor soil moisture conditions and manually adjust water flow. The system also includes temperature, humidity, and rain drop sensors, which have been updated to allow remote monitoring of these parameters through the internet. In real time, these field weather variables are stored in a remote database. Finally, based on the present weather conditions, a weather prediction algorithm is employed to manage water distribution. Farmers would be able to irrigate their crops more efficiently with the proposed smart irrigation system.

### **Automated Irrigation System-IoT Based Approach Dweepayan Mishra, Arzeena Khan, Rajeev Tiwari, Shuchi Upadhaye Year: 2018.**

Agriculture is a substantial source of revenue for Indians and has a huge impact on the Indian economy. Crop development is essential for enhanced yield and higher-quality delivery. As a result, crop beds with ideal conditions and appropriate moisture can have a big influence on output. Traditional irrigation systems, such as stream flows from one end to the other, are usually used. As a result of this delivery, the moisture levels in the fields can alter. A designed watering system can help to enhance the management of the water system. This research proposes a terrain-specific programmable water system that will save human work while simultaneously improving water efficiency and agricultural productivity. The setup is made up of an Arduino kit, a moisture sensor, and a Wi-Fi module. Data is acquired by connecting our experimental system to a cloud

framework. After then, cloud services analyse the data and take the necessary actions.

### **IoT Based Smart Crop-Field Monitoring and Automation Irrigation System. R.Nageswara Rao, B.Sridhar Year: 2018.**

Agrarian countries like India rely heavily on agriculture for their development. Agriculture has always been a roadblock to the country's development. Smart agriculture, which comprises modernising present agricultural systems, is the only answer to this challenge. As a result, the suggested strategy attempts to use automation and Internet of Things technologies to make agriculture smarter. Crop growth monitoring and selection, irrigation decision assistance, and other uses are possible thanks to the Internet of Things (IoT). To modernise and boost crop yield, a Raspberry Pi-based autonomous irrigation IOT system has been proposed. This project's main purpose is to produce crops using the least amount of water possible. Most farmers waste a lot of time in the fields in order to focus on water available to plants at the appropriate time. Water management should be improved, and the system circuit's complexity should be minimised. Based on the data collected from the sensors, the suggested system determines the amount of water required. Two sensors detect the humidity and temperature of the soil, as well as the humidity, temperature, and length of sunshine each day, and send the data to the base station. Based on these characteristics, the recommended systems must calculate the irrigation water quantity. The key benefit of the system is the integration of Precision Agriculture (PA) and cloud computing, which will reduce water fertiliser consumption while increasing crop yields and assisting in the evaluation of field weather conditions.

### **A Smart Wireless System to Automate Production of Crops and Stop Intrusion Using Deep Learning Shrihari M. Year: 2020**

The concept of automating agricultural production has been around since the early 1990s, and one of the primary challenges that both scientists and farmers confront is irrigation. Irrigation is a dynamic system that is heavily reliant on outside influences. This article describes a method that uses a custom-built mathematical model to handle data from wireless sensors on Google Cloud, resulting in a smart system. An IoT-enabled design that can scale up to big farms. According to Holistic Agricultural Studies, around 35 have been damaged by animals and people. This intelligent system uses Tensor flow and deep learning neural networks to recognise animals depending on their threat level, as well as

human intruders who are not authorised on the farm, and to alert the farmer immediately. An android application is included with the device, which allows for remote access and surveillance through live video streaming.

### **IoT Based Smart Agriculture System G. Sushanth, and S. Sujatha. Year: 2018.**

Smart agriculture is a novel concept since IoT sensors can offer information about agricultural regions and then act on it based on user input. The purpose of this study is to develop a smart agricultural system that utilises cutting-edge technologies such as Arduino, Internet of Things, and wireless sensor networks. The purpose of this study is to develop a system that can monitor temperature, humidity, wetness, and even the movement of animals that might damage crops in agricultural areas using sensors, and then send an SMS notification as well as a notification on the app developed for the same to the farmer's smartphone via Wi-Fi/3G/4G if there is a discrepancy. The system uses a duplex communication link based on a cellular Internet interface, which allows data inspection and irrigation schedule to be changed using an android app. Because of its energy independence and inexpensive cost, the gadget has the potential to be useful in water-scarce, geographically isolated areas.

### **Smart Agriculture Using Internet of Things with Raspberry Pi- Zuraida Muhammad, Muhammad Azri Asyraf Mohd Hafez, Nor Adni Mat. Year: 2020.**

The term used for networking of objects, equipment, vehicles, and other electronics device into the network for information exchange purpose is called Internet of Things (IoT). Nowadays, IoT is widely used for connecting device and collecting data information. Therefore, the use of IoT is very relevant for agriculture. The project is about smart agriculture system that is implemented with IoT. The system is combined with irrigation system in order to cope with the unpredictable weather in Malaysia. Raspberry Pi 4 Model B is used as the microcontroller of this system. DHT22 and soil moisture sensor is used to detect the temperature and humidity in surrounding and moisture level of the soil respectively where the output will be displayed on smartphone and computer. So, Smart Agriculture Systems using Internet of Things with Raspberry Pi brings a tremendous impact on the farmer's working method. Plus, it will also bring a positive effect on the crop production in Malaysia. Where about 24.44% water savings rate in a year can be achieved when using IoT-based irrigation

systems compared to traditional irrigation systems. This would save the expenditure for hiring workers and avoid water wastage in daily needs.

### **IoT based smart soil monitoring system for agricultural production Divya J., Divya M., Janani V., N.Ananthi. Year: 2017.**

Agriculture plays the major role in economics and survival of people in India. The purpose of this project is to provide embedded based system for soil monitoring and irrigation to reduce the manual monitoring of the field and get the information via mobile application. The system is proposed to help the farmers to increase the agricultural production. The soil is tested using various sensors such as pH sensor, temperature sensor, and humidity sensor. Based on the result, the farmers can cultivate the appropriate crop that suits the soil. The obtained sensor values are sent to the field manager through the Wi-Fi router and the crop suggestion is made through the mobile application. Automatic irrigation system is carried out when the soil temperature is high. Crop image is captured and it is sent to the field manager to suggest pesticides.

### **Development of Smart Drip Irrigation System Using IoT Anushree Math, Layak Ali, Pruthviraj U. Year: 2018.**

India is a country with agriculture having paramount significance. Hence it is important to irrigate the plants in an astute way to get good production by maximizing the yield per unit space. Irrigation is the supply of an appropriate amount of water to the plants at a precise time. The objective of this endeavour is to irrigate the plants using the smart drip irrigation system within National Institute of Technology Karnataka campus. To achieve this, open source platform is used as a central controller of the system. Various sensors have been employed which continuously provide the existing parameters of factors governing healthiness of plants. Based on the information obtained from the RTC module water is supplied to the plants at regular interval of time by controlling a solenoid valve. The health of the plants is monitored by a raspberry pi camera which gives live streaming to the webpage. Water flow sensor accords information about water flow to the controller by the means of wireless communication. This information is analyzed by the controller to find out leakages in the pipe. Further, weather prediction is carried out, so as to regulate the quantity of water being administered thus making it more reliable and efficient.