

IoT Based Smart Crop Protection System for Agriculture

Literature Survey – 1

Name: Machine Learning Based Prediction of Reference Evapotranspiration (ET₀) Using IoT

Authors: ZHIMING HU¹ , RAB NAWAZ BASHIR ² , AQEEL UR REHMAN² , SALMAN IQBAL² , MALIK MUHAMMAD ALI SHAHID ² , AND TING XU³.

Published In: IEEE Access

Year: 2022

Summary:

In this paper, they proposed an approach based on Machine Learning for Evapotranspiration (ET₀) rate determination on directly sensed environmental conditions for ET₀ rate determination are proposed by the architecture. Comparisons between various machine learning algorithm were compared in the paper

Merits:

1. The KNN model is more accurate as compared to SVM, GNB and ANN models with 92% accuracy
2. The KNN model of ET₀ is more efficient in reducing the Root Mean Squared Errors (RMSE) by 16% and Mean Absolute Errors (MAE) by 3%

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Literature Survey – 2

Name: IOT Based Soil Testing Instrument For Agriculture Purpose.

Authors: Siddalinga Nuchhi, Vinay Kumar Bagali, Shilpa Annigeri

Published In: IEEE Xplore

Year: 2021

Summary:

The major concern of the work is to develop an instrument to maximize the yield of the crop with nutritious analysis of soil. In the proposed method sensor measures the soil fertility. The Arduino board is used to have a proper readout of the values and for conversions of the data.

With the help of the thingspeak platform the data of the measured parameters will be sent to farmers of the respective fields through a cloud platform.

Merits:

1. The application has the capability to recommend the fertilizer required to suit the necessary requirement of the plant/crops with improvement in the standards of soil for increasing the yield

De Merits:

1. Electrochemical sensor method, Spectroscopy method, and Conductivity method are the methods used here but these methods didn't give accurate results.
2. The instruments are not fabricated and commercialized.

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Literature Survey – 3

Name: Smart Crop Cultivation Monitoring System by Using IoT

Authors: Khampheth Bounnady, Poutthasone Sibounnavong, Khampasith Chanthavong, Savath Saypadith

Published In: IEEE Conference

Year: 2019

Summary:

In this paper, the monitoring of soil moisture, temperature, and water control has been done by using NodeMCU ESP8266, sensors, and cloud computing. Implementation of three methods has been done for studying the growth rate, production rate, and water-saving rate of crops namely traditional farms, the greenhouse by using a timer to control soil moisture, and the greenhouse by using sensors to automatically control soil moisture.

Merits:

1. The growth rate of the proposed method is better than the traditional form by 41.2% and better than a timer to control soil moisture by 23.1%
2. The productivity is getting more than traditional farm by 70% and more than a timer to control soil moisture is 12.1%
3. The water saving is better than traditional farm by 20.9% and better than a timer to control soil moisture is 5.5.

De Merits:

1. It has very limited processing power so it can't be used for projects which need high processing

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Literature Survey – 4

Name: IoT based System for Smart Agriculture.

Authors: Ioana M. Marcu, George Suciu

Published In: IEEE Conference

Year: 2019

Summary:

Libelium is a platform (hardware and software) used in IoT solutions systems and it is based on wireless sensor networks. This integration enables the measuring of different parameters related to weather conditions, light and radiation levels, soil morphology, fertilizer presence, frost prevention, and daily monitoring to improve crop quality production and prevent harvest losses.

Merits:

1. Libelium based on IoT technologies can lead to good and accurate precision in monitoring, analysing, assessing and controlling agricultural fields.
2. It helps in improving maximum accuracy for crop monitoring

De Merits:

1. implementing DoS attacks to limit data transmission between Meshlium and the server

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Literature Survey – 5

Done By:

Name: Research on the Monitoring System of Wheat Diseases, Pests and Weeds Based on IOT

Authors: Shufen Zhang, Xuebin Chen, Shi Wang

Published In: IEEE Conference

Year: 2014

Summary:

In this paper, the proposed system uses the ZigBee network to connect the terminal sensing devices, and connect the big data platform by IoT. This system uses data that was collected by the IoT terminal to build a big data platform and built an intelligent warning system of wheat diseases, pests and weeds on the platform

Merits:

1. Automatic identification of the object and information sharing through the internet.
2. The system not only can diagnose and forecast the occurrence of wheat diseases, pests and weeds but also can provide decision consulting

De Merits:

1. The transmission rate of this technology is also low
2. Implementation of Zigbee technology can be expensive.