Vardhaman College of Engineering

(AUTONOMOUS)

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Kacharam, Shamshabad, Hyderabad – 501218, Telangana, India

Department of Computer Science and Engineering (AI & ML)

Project Work Phase (1) -A7044

Title: Soil Quality and Management using DL and IoT for Precision Agriculture

Abstract

Soil quality plays an important role in agriculture, Where the farmers are used to apply their traditional knowledge to analyze the soil of the farm, based on the knowledge through analysis they will incorporate the methods to be used to improve the quality of the soil and appropriate techniques to manage the soil throughout the crop cycle. Analyzing the soil day by day will become a hectic task for farmers and if their intuition is not correct the whole crop will be wasted as they cannot use appropriate measures in agriculture. Soil Quality and Management system that leverages the power of Deep Learning (DL) and Internet of Things (IoT) to provide real time, data driven insights for optimizing agricultural methods and enhance the agricultural productivity.

By deploying a various of IoT sensors like soil moisture sensor, pH sensors, nutrient sensors and temperature sensor etc. we collect the data of soil parameters. And then this data is transmitted to a centralized cloud platform or local storage, where the deep learning model processes the data to identify patterns, predict soil conditions based on the data received, then the system will generate recommendations for soil management and suitable crops for the soil.

The system is designed to be scalable, adaptable to different soil types, crops, and capable of real time operation, and it provides immediate alerts and recommendations to farmers as per the data generated through sensors. This project ensures in enhanced soil quality and health, improved yields and sustainable agricultural practices.

Keywords: *Soil Quality, Deep Learning, Internet of Things (IoT), IoT sensors, Pattern Recognition, Real Time data, Recommendations.*

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