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In Collaboration with

UNIVERSITY OF WESTMINSTER

AgroBrain: Automated Crop Recommendation System

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Submitted in partial fulfilment of the requirements for the BEng (Hons) in Software
Engineering degree at the University of Westminster.

May 2023

Abstract

The agriculture sector plays a crucial role in the economy of any country, and the soil is the most valuable natural resource for agriculture. Soil quality, which mainly depends on pH value and soil classification, is a key factor in maximizing crop yields. However, the growing population's demand for food has led to the increased use of pesticides and fertilizers, which can reduce soil fertility, increase toxicity and decrease soil holding capacity. Therefore, maintaining proper soil classification is essential before plantation, and image processing techniques can help determine soil classification accurately.

This paper proposes a system that bridges the gap between farmers and technology by predicting soil classification based on its pH value using soil images and recommending crops accordingly. The Convolutional Neural Network (CNN) algorithm is used for soil classification, which has proven to be effective in image processing tasks. Additionally, use an ensemble model for crop recommendation, which considers several attributes, such as soil classification, rainfall, humidity, and temperature.

The system's accuracy and effectiveness were evaluated using a large dataset of soil images and environmental data. The results indicate that our proposed system can accurately predict soil classification and recommend crops, with an overall accuracy of 98%.

Keywords: Image Processing, Deep Learning, Ensemble Technology, Crop Recommendation, Soil Classification