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Implementation of Crop Recommendation

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ABSTRACT: In general, agriculture is the backbone of India and also plays an important role in Indian economy by providing a certain percentage of domestic product to ensure the food security. But now-a-days, food production and prediction is getting depleted due to unnatural climatic changes, which will adversely affect the economy of farmers by getting a poor yield and also help the farmers to remain less familiar in forecasting the future crops. This research work helps the beginner farmer in such a way to guide them for sowing the reasonable crops by deploying machine learning, one of the advanced technologies in Crop Recommendation. Naive Bayes, a supervised learning algorithm puts forth in the way to achieve it. The seed data of the crops are collected here, with the appropriate parameters like temperature, humidity and moisture content, which helps the crops to achieve a successful growth. In addition as the software, a mobile application for Android is being developed. The users are encouraged to enter parameters like temperature and their location will be taken automatically in this application in order to start the prediction process

KEYWORDS: Agriculture, Machine learning, Crop recommendation, Soil, Crop yield, Crop images, Effective farming Introduction, CNN.

I. INTRODUCTION

Crop yield prediction is one of the challenging tasks in agriculture. It plays an essential role in decision making at global, regional, and field levels. The prediction of crop yield is based on soil, meteorological, environmental, and crop parameters. To maximize the crop yield, selection of the appropriate crop that will be sown plays a vital role. We are going to design a convolutional neural network (CNN) approach that took advantage of state-of-the-art modeling and solution techniques to predict the crop yield. In this case, we are using a dataset from Kaggle which contains the previous weather conditions (rain, temperature, etc), pesticides and accurate information about history of crop yield. This things we are using for making decisions related to agricultural risk management and future predictions.

II. LITERATURE REVIEW

1. “Crop Yield Prediction of Indian Districts Using Deep Learning”

This research is done by Parjanya Prashant, Kaustubh Ponkshe, Chirag Garg, Ishan Pendse, Prathamesh Muley.

Abstract: Researchers propose a novel deep learning model - an ensemble neural network model using Long ShortTerm Memory (LSTMs) and onedimensional Convolutional Neural Networks (CNNs). achieve a correlation coefficient value of over 0.90 and 0.92 for our model for train and test datasets.

2. “Effective Crop Recommendation Using Deep Learning”

This research is done by Akash Mondal, Saikat Banerjee.

Abstract: Research work proposes and implements a model to predict crop yield from previous data. The proposed model for Crop Recommendation is developed using Feed forward neural network, Rectified Linear Activation Unit, backward and forward propagation techniques. The experimental result shows the proposed model performance is quite satisfactory Context-Aware Collaborative Filtering Recommender Systems.

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3." Crop Recommendation using Machine Learning"

This research is done by M.Kalimuthu, P.Vaishnavi, M.Kishore.

Abstract: The seed data of the crops are collected here, with the appropriate parameters like temperature, humidity and moisture content, which helps the crops to achieve a successful growth. In addition, as the software, a mobile application for Android is being developed. The users are encouraged to enter parameters like temperature and their location will be taken automatically in this application in order to start the prediction process.

4. "Crop Yield Prediction Using Deep Neural Network"

This research is done by Fatin Farhan Haque, Ahmed Abdelgawad.

Abstract: A machine learning model proposed illustrated the use of neural network and the concerned algorithm artificial neural network (ANN) has been evaluated. The results being shown provides a better recommendation of using artificial neural network as the base algorithm for predicting continuous multiple regression model. It can be deduced that unsupervised learning is preferable in terms of getting continuous prediction outcome than the supervised learning algorithms.

III. METHODOLOGY

Image Selection: We have to select data as our dataset and provide it to the system which we have to trained.

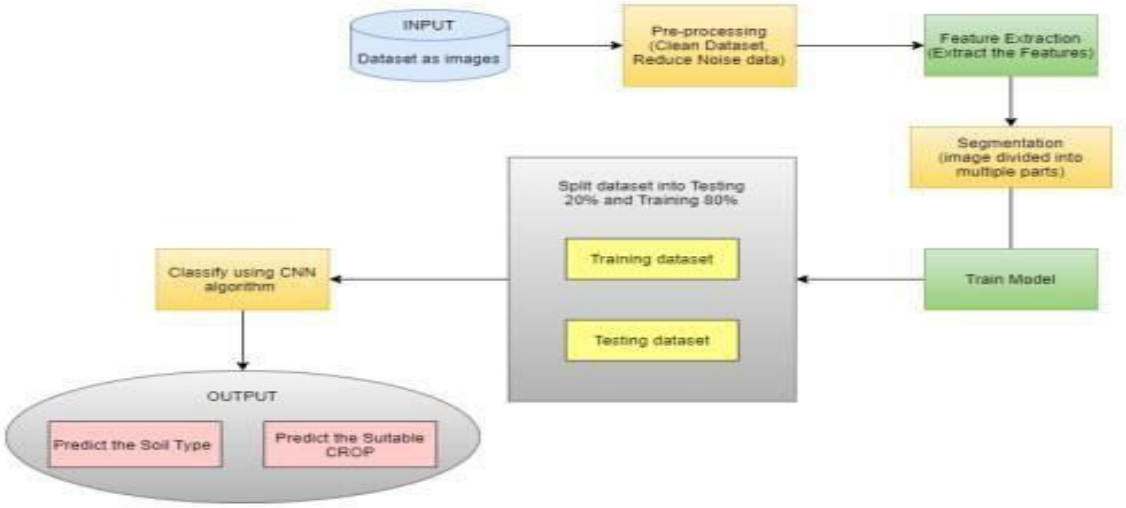
Pre-processing: Image pre-processing are the steps taken to format images before they are used by model training and inference. This includes, but is not limited to resizing, orienting, and color correction.

Feature Extraction: Feature extraction refers to the process of transforming raw data into numerical features that can be processed while preserving the information in the original data set. It yields better results than applying machine learning directly to the raw data.

Segmentation: Segmentation, the technique of splitting customers into separate groups depending on their attributes or behavior, makes this possible.

Classification: CNNs are used for image classification and recognition because of its high accuracy. The CNN follows a hierarchical model which works on building a network, like a funnel, and finally gives out a fully-connected layer where all the neurons are connected to each other and the output is processed.

System Architecture:



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IMPLEMENTATION:

Firstly, the application will be started by the user, and they will have the option to select the registration, login and end. When the user will select the registration optionthe user fill the form to create the username and password. When the username and password is create and select the login and entered the username and password and click to the login button .They go for next page and click on the soil detection button.

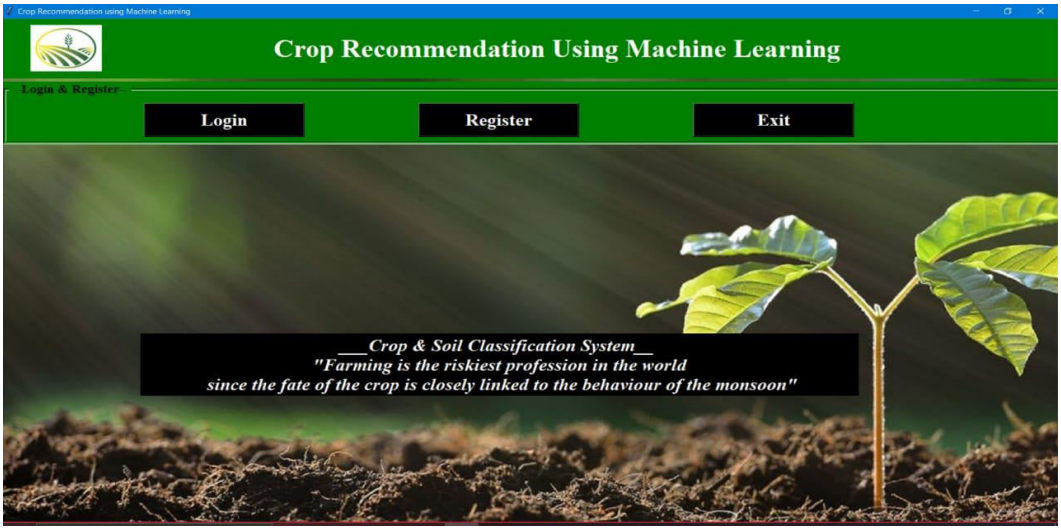
The last process is to select the image and then the machine learning model needs to extract features from the preprocessed images. Several approaches exist for feature extraction, including using handcrafted features and using convolutional neural networks (CNNs) to learn features automatically. At last the outputwill come that which crop is best for the soil.

Steps for Implementation:

1. Registration: Implement a registration feature to allow new users to create an account and access the crop recommendation system.
2. Login: Implement a login feature to ensure that only authorized users can access the crop recommendation system. You can use tools like Flask-Login or Django-Authentication for user authentication and authorization. This will help to protect the privacy and security of the user's data and ensure that the recommendations are personalized to each user's specific needs.
3. Data Collection: Collect data on the crops, soil properties, weather conditions, and other relevant parameters from various sources such as government databases, research papers, and farming communities. This data should cover a large area to ensure that the recommendations are region-specific.
4. Model Training: Train the selected model using the preprocessed data set. Split the data into training and validation sets to evaluate the model's performance. You can use techniques like k-fold cross-validation or stratified sampling for model training
5. Exit Option: Add an option for users to exit the system or go back to the main menu if they don't want to continue with the crop recommendation process. This will make the user interface more user-friendly and give users more control over the system.

IV. RESULTS

1)Main Page



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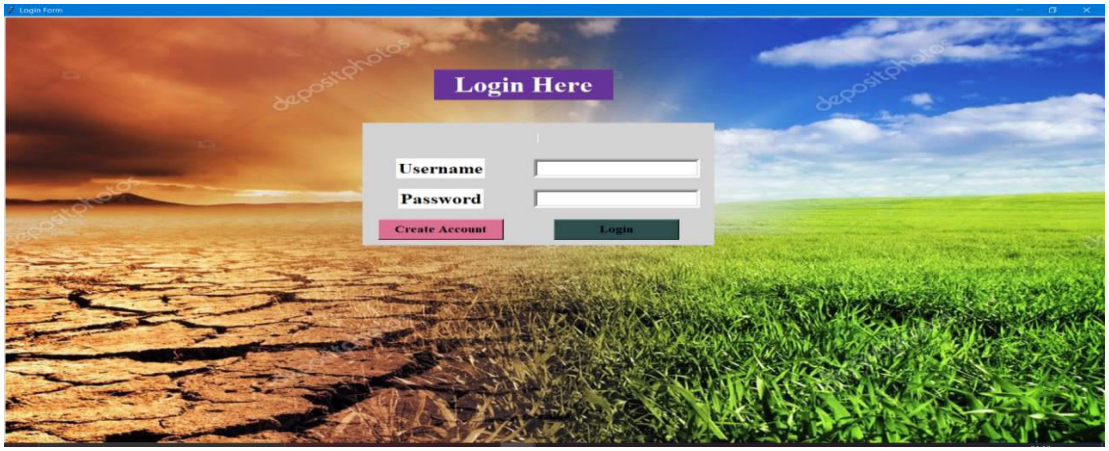
2) Registration Page

3) Login Page



4) Detection Page

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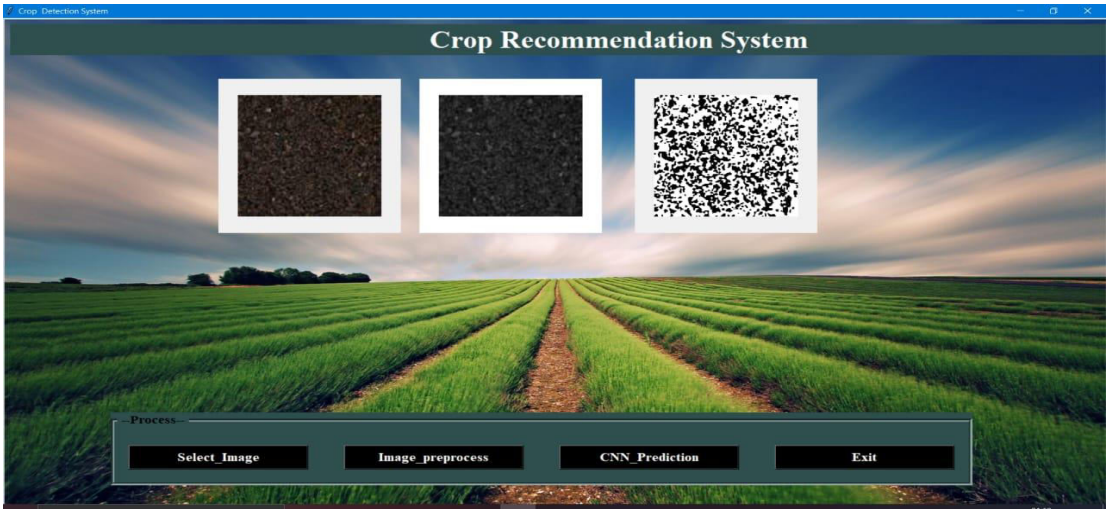
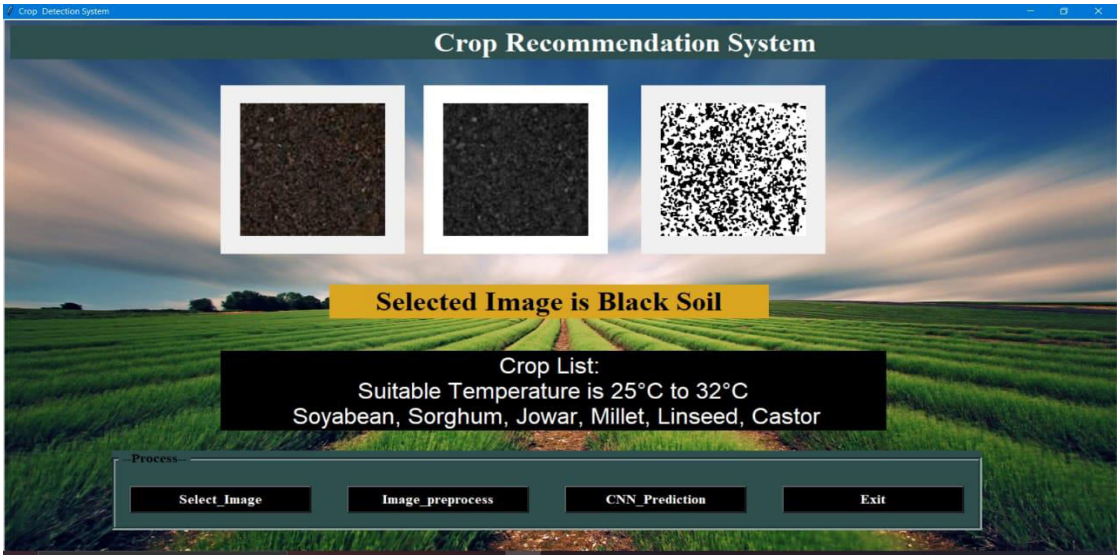
5) Image Preprocess



6) CNN Prediction



V. CONCLUSION

A model is proposed for predicting soil series and providing suitable crop yield suggestion for that specific soil and weather. The model has been tested by applying different kinds of Deep algorithm. CNN shows highest accuracy in soil classification and suggests crops with less time. It gives us more accuracy as compared to existing system and gives more benefit to farmers.

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