"Plant Disease Detection by Using Deep LearningAlgorithm with Product, Price Recommendation and Crop prediction."

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Abstract - *In India, agriculture has come to be an important source of economic development. The farmer selects a suitable crop based totally at the sort of soil, climate condition of the location, and economic cost. The agriculture industries started attempting to find new strategies to increase the manufacturing of food because of the increasing population, adjustments in climate and on the spot deep mastering with convolutional neural networks has performed amazing fulfillment in the classification of diverse plant sicknesses. In this examine, a ramification of neuron-wise and layer-wise visualization techniques are carried out the usage of a CNN, educated with a publicly available plant disorder photo dataset. We show neural networks can seize colors, textures of lesions specific to respective diseases on diagnosis.*

Key Words: Crops Prediction, Soil Detection, Medicine, Disease detection

1. INTRODUCTION

In general, agriculture is the spine of India and additionally performs an critical function in Indian financial system by means of offering a certain percent of home product to make certain the meals security. However now-a-days, meals production and prediction is getting depleted because of unnatural climatic changes, so that you can adversely have an effect on the financial system of farmers via getting a poor yield and additionally assist the farmers to stay less acquainted in forecasting the destiny plants. This research work allows the newbie farmer in this sort of way to manual them for sowing the motive-capable crops by way of deploying system studying, one of the advanced technologies in crop prediction and disease prediction. CNN algorithm places forth in the way to attain it. The seed facts of the plants are amassed here, with the appropriate parameters like "temperature, humidity and moisture" content material, which enables the vegetation to attain and a hit increase. The users are endorsed to go into parameters like temperature and their region will be taken automatically in this application that allows you to begin the prediction Procedure. Also software will recommend medicine for leaf disease and display its rate.

1.1 Project Scope

"Agricultural departments wants to automate the detecting the yield plants from eligibility method (real time)".To automate this technique with the aid of show the prediction result in internet utility or computer application. To optimize the work to implement in artificial Intelligence environment.

1.2 Methodologies of problem solving

We planned to design a module so that someone with no planning experience could use and get information about soil and plant diseases. It proposed a program to predict plant and leaf diseases. It also indicates the cure for the disease and its value.

1.2 Motivation of the project

Modern technology have enabled human society to provide sufficient food to feed extra than 7 billion humans but, food security continues to be jeopardized due to a ramification of factors which includes weather change, pollinator decline, crop plant illnesses, and others. Crop Plant illnesses now not only pose an international threat to Food protection, however they can also have disastrous effects for smallholder farmers whose livelihoods depend upon healthy crops. Moreover, most people of hungry human beings (50 percentage) stay in smallholder farming households, making smallholder farmers mainly prone to pathogen-associated disruptions in meals deliver.

2. SOFTWARE REQUIREMENT AND SPECIFICATIONS

2.1 Assumption and dependencies

- **Assumption:**

As we give input image of plant system shoulddetect the disease on crop.

- **Dependencies:**

We are totally depend on CNN model.

2.2 Functional Requirement

- **System Feature 1(Functional Requirement)**

Crop disease should be detect using CNN algorithm.

- **System Feature 2(Functional Requirement)**

    Dataset is trained and tested properly

2.3 Software Requirements

- IDE : Spyder
- Coding Language : Python
- Operating System : Windows 10

2.4 Hardware Requirements

- RAM : 8 GB
- Hard Disk : 40 GB
- Processor : Intel i5 Processor

2.5 Non-Functional Requirements

2.5.1 Performance Requirement

- The performance of the functions and every module must be well.
- The overall performance of the software will enable the users to work efficiently.
- Performance of response should be fast.
- Performance of the providing virtual environment should be fast.

2.5.2 Performance Requirement

The application is designed in modules where errors can be detected and fixed easily. This makes it easier to install and update new functionality if required.

3. SYSTEM DESIGN
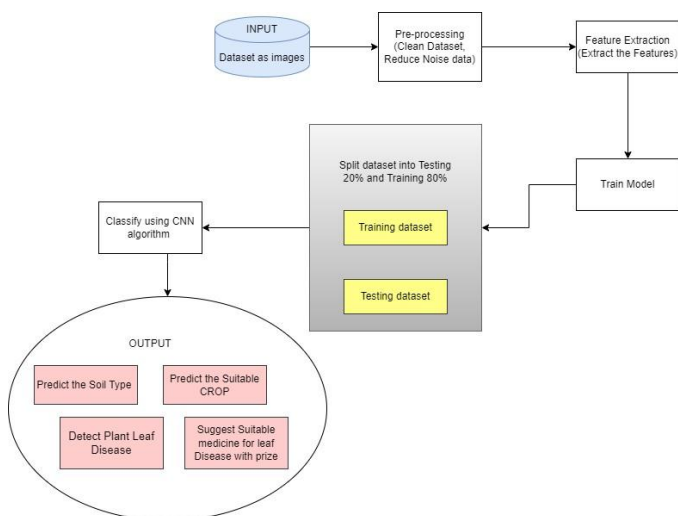
3.1 System Architecture:

Fig-1: System Architecture

Mathematical Model:

Let S be the Whole system S= I, P, OI-input

P-procedureO-output

Input (I) I = Dataset

Where, Dataset contain Textual Dataset.Procedure (P),

P = I, Using I System perform operations and calculate the prediction Pre-processing

Feature Extraction Classification using CNNOutput (O)

O= System to Recommend Products.

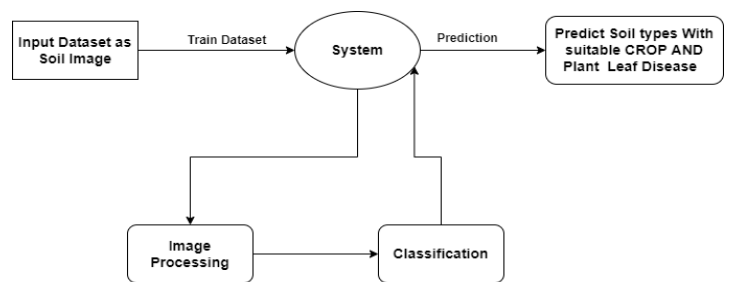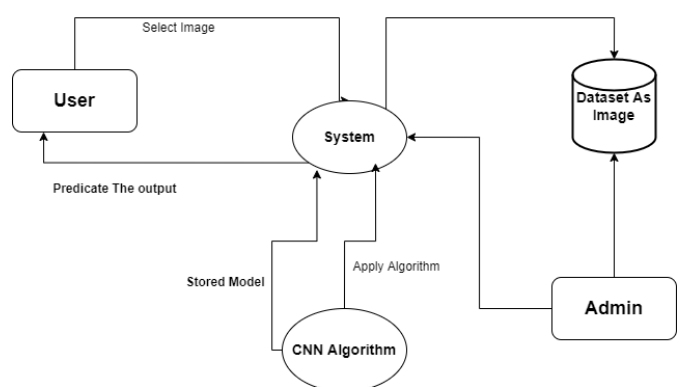### 3.2 Data Flow diagram

Fig. DFDO

Fig. DFD1

Fig. DFD2

In the Data Flow diagram, we show that the data flow in our system in DFD0 shows that the DFD base where rectangular current inputs and outbound circuits reflect our system, In DFD1 we display real input and actual output inputs for our system. system text or image and output are similarly in DFD2 we present user functionality and management.

4. SPECIFICATIONS

4.1 Advantages

Predicting productivity of crop in diverse climatic situations can assist 'farmer' and other partners in vital primary management as some distance as agronomy and product selection. This version may be used to pick out the maximum wonderful crops for the area and additionally its yield thereby enhancing the values and gain of farming additionally. Expect leaf plant sickness and also show medication and its charge.

4.2 Applications

Disease detection is an important function of decision-makers at national and regional levels so that decisions can be made quickly. An accurate model of crop yield prediction can help farmers decide what to plant and when to plant it. There are various ways to predict crop yields.

4.3 Limitation

1. This system requires internet connection.
2. User needs to put correct data.

5. FUTURE SCOPE

In the case of rainfall it may indicate whether additional water is needed or not. This Project project can be upgraded by using it throughout India. Plant Disease Detection using Image Processing where users can upload a photo of a diseased plant and get pesticide recommendations. Implementation of an intelligent Irrigation System to monitor the climate and soil conditions, plant water use etc. to automatically change the irrigation system.

6. CONCLUSION

A version is proposed for predicting soil collection and providing suitable crop yield idea for that precise soil and detecting plant leaf ailment. The version has been tested with the aid of making use of extraordinary varieties of Deep set of rules. CNN indicates maximum accuracy in soil type and shows vegetation with much less time. It offers us extra accuracy as compared to existing machine and gives extra gain to farmers.

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