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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MINI PROJECT - PLANT DISEASE DETECTION APP

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Problem Statement:
To create an android app to detect plant diseases and suggest remedies to cure it.

Problem description:
Plants are considered as energy supply to mankind.Plant diseases can affect the agriculture which can be resulted in huge loss on the crop yield. Therefore, leaf diseases detection plays a vital role in agricultural field. However, it requires large manpower, more processing time and extensive knowledge and skills about plant diseases. Hence, machine learning comes in play in the detection of diseases in plant leaves as it analyzes the data from various areas, and classifies it into one of the predefined set of classes. The features and properties like color, intensity and dimensions of the plant leaves are considered as a major fact for classification and the various types of plant diseases and different classification techniques in machine learning that are used for identifying diseases in different plants leaf.

Introduction:
The primary occupation in India is agriculture. India ranks second in the agricultural output worldwide. Here In India, farmers cultivate a great diversity of crops. Various factors such as climatic conditions soil conditions, various diseases,etc affect the production of the crops. The existing method for plants disease detection is simply an eye observation which requires more man labor, properly equipped laboratories, expensive devices, etc. And improper disease detection may leads to inexperienced pesticide usage that can cause development of long term resistance of the pathogens, reducing the ability of the crop to fight back. The plant disease detection can be done by observing the spot on the leaves of the affected plant. The method we are adopting to detect plant diseases is image processing using Convolution neural network (CNN).The user is to select a particular diseased region in a leaf and the cropped image is sent for processing. This project intends to study about the prediction of the plant diseases, at an early phase using k-mean clustering algorithm. Specifically, we concentrate on predicting the disease. It will be useful for identifying different diseases on crops. Back propagation concept is used for weight adjustment at the time of training our dataset. The aim of our project is to identify and classify the diseases accurately from the leaf images and provide the solution for it. The steps required in the process are preprocessing, training, identification and solution providing.
The main objectives of this project are:
1)To detect plant diseases.
2)To create a platform that will enable the end users to know and prevent the plants from their diseases.
3)To provide remedies for the disease that is detected.

Problems with the existing system:
The existing method for plant disease detection is simply naked eye observation by experts through which identification and detection of plant disease is done.For doing so a large team of experts as well as continuous monitoring of plant is required,which costs very high as well as time consuming.

Working Methodology:
Our proposed system is an application based software. We have an android based software which simply takes the image of the plant and uploads it to the mobile device. Then this image is sent through a Convolutional Neural network which encodes this image into a numerical array and classifies it with the other numerical arrays in the model. The model is a tensorflow model which is made into a tensorflow lite model because of the large size of the normal tensorflow model. This model helps classify the uploaded image numerical value to the dataset values. When a numerical array matches it calculates the confidence and displays the value which has the highest confidence. In this way, we can ensure that we always have the highest confidence value showing in the results. The proposed methodology is as follows:

1)Image acquisition
2)Image preprocessing
3)Image segmentation
4)CNN based classification
5)disease detection and providing solutions.

Technologies to be used:

For client-side we will be using JAVA and XML,for server-side we will be using JAVA.We will be using SQLite database which can be implemented in android app.Also we will be using python language and its libraries such as keras,opencv,matplotlib,tensorflow etc, for doing machine learning.

Limitations of the proposed system:

1)For now we will be only detecting diseases in three plants i.e tomato,pepper and potato.

Future Work:

1)In future we will be expanding our project so that it should be able to predict diseases in more than three plants.
2)Integrating climate data for crop yield prediction and recommendations.
3)chatbot for personalised help.
4)Setting reminder for pesticides/watering.

Conclusion:

In this project the Deep Learning algorithm i.e. Convolutional Neural Network is used with a goal to detect the diseases in the crops. The model is basically tested on some types of plant species with some types of plant diseases. The model was made using Tensor flow and Keras frameworks and the system is implemented on Android. The overall system results show that the Mobile Net model works better as compared to the other models and provide better accuracy in detecting the diseases .As an extension to the project the number of classes of plants and its diseases will be increased .Also the model will be further improved by increasing the parameters for training and test.

References:

1) Dataset - https://www.kaggle.com/emmarex/plantdisease.
2) Plant Disease Detection using Ai Techniques (IJSRD/Vol. 7/Issue 12/2020/27)