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Plant Leaf Disease Detection Using Machine Learning

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Abstract: *Indian Economy mainly depends on Agricultural productivity. This is the one of the motives that disease detection in plants plays an vital role in agriculture field, as having disease in plants are quite usual. If proper care is not taken in this area then it causes serious effects on plants and due to which particular product quality, quantity or productivity is affected. For instance a disease named little leaf disease is a harmful disease found in pine trees in United States. Detection of plant disease through some involuntary technique is beneficial as it reduces a large work of monitoring in big farms of crops, and at very early stage itself it detects the symptoms of diseases i.e. when they appear on plant leaves. According to past studies, 42% of agriculture production is in loss and that too only because of the increasing rate of loss due to plant leaf disease detection technique can be applied to identify a disease from the input pictures. We have proposed the machine learning based approach for image recognition. The use of convolutional neural network in the problem of plant disease detection has very good results. CNN is recognized as the best method for image recognition.*

Key Word: *Disease detection; Image processing ;CNN features ; High yield; Image recognition; Image classification*

I. INTRODUCTION

Machine learning (ML) is the study of algorithms and mathematical models that computer systems use to continuously enhance their performance on a certain task. Machine learning algorithms make a arithmetic model of trial data, known as "training data", in order to make predictions or decisions without being externally programmed to implement the task. Machine learning is firmly related to computational statistics, which emphasizes on making predictions using computers. The study of mathematical optimization provides methods, theory and application domains to the domain of machine learning. Data mining is a field of study in machine learning, and concentrates on exploratory data analysis through unsupervised learning. Machine learning tasks are categorized into a lot of broad categories. In supervised learning, the algorithm builds a mathematical model of a set of data that includes both the inputs and the desired outputs. For instance, if the task were determining whether an image contained a certain object, the training data for a supervised learning algorithm would have pictures with and without that object (the input), and each picture would have a label (the output) designating whether it contained the object. In special cases, the input may be only partly available, or confined to special feedback. Semi-supervised learning algorithms develop mathematical models from inadequate training data, where portions of the sample inputs are missing the desired output. Plant disease recognition by optical way is more laborious task and at the same time, less accurate and can be done only in limited areas. When automatic detection technique is used it will take less efforts, less time and become more accurate. In plants, some common diseases seen are brown and yellow spots, early and late scorch, and others are fungal, viral and bacterial diseases. Image processing is used for estimating affected area of disease and to determine the distinction in the color of the affected area.

When it comes to machine learning Artificial Neural Networks execute really good. Artificial Neural Networks are used in several classification tasks like image, audio, words. Different kinds of Neural Networks are used for different purposes, for instance for predicting the series of words we use Recurrent Neural Networks more accurately an LSTM, likewise for image classification we use Convolutional Neural Network. ConvNets derive their name from the "convolution" operator. The primary purpose of Convolution in case of a ConvNet is to extract characteristics from the input image. Convolution maintains the spatial relationship between pixels by learning image features using small filters.

II. MATERIAL AND METHODS

Nilam Bishe, Shreya Kathet,Amara Adgaonka,In this paper the Deep Learning algorithm i.e., Convolutional Neural Network is used with a goal to detect the diseases in the crops. The model is fundamentally tested on a few types of plant species with some types of plant diseases. The model was made using Tensor flow and Keras frameworks and the system is executed on Android. The comprehensive 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 raised. Also the model will be further enhanced by increasing the parameters for training and test.

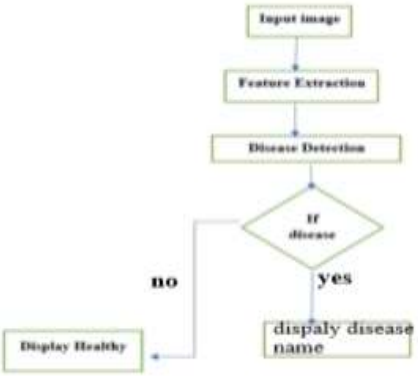
SenthilKumar Meyyappan, Sridhathan Chandra- mouleeswaran ,This work gives efficient and accurate plant disease detection and classification technique by using image processing technique. Kmeans and GLCM techniques are used for plant leaf disease detection. This automated system deduce time of detection and industriousness cost. It can help the farmers to distinguish the disease Plant Infection Detection Using Image Process take antidotal action accordingly. It is not extended its database for more leaf disease identification .

Lili Li, Shujuan Zhang, Bin Wang, In this paper provided adequate data is available for training,deep learningtechniques are capable of identifying plant leaf diseases with high accuracy. The importance of collecting large datasets with high variability, data augmentation, transfer learning, and visualization of CNN activation maps in improving classification precision.Most of the DL frameworks proposed in the literature have good detection effects on their datasets, but the effects are not good on other datasets, that is the model has poor forcefulness. Therefore, better sturdiness DL models are needed to adjust the diverse disease datasets.

III.PROPOSED SYSTEM

The Diseases in plants are a major worries to the farmers these days. Many of times, the farmers are not decided which pesticides or insecticides is require to treat a particular diseased plant because they are not sure of the type of the diseases. These results in spraying wrong pesticides, damaging the plants which affect the plant yield.To get control of this problem, we have come up with a solution of developing a system that can easily identifies some common diseases that occur in plants by merely examining the leaves of plants by using CNN.

ARCHITECTURE DIAGRAM



SYSTEM DESIGN

A system design is the conceptual model that defines the structures, performance, and more visions of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behavior of the system.at first, an image is taken as input into the system. The features of the disease are extracted from the uploaded image. Then, the image is checked properly whether it is of a disease or not. If it is not a leaf disease “healthy” message is displayed. If it is a disease it will display the name of the disease.

MODULES:

DISEASE DETECTION

First, an image of the leaves affected area is uploaded. With this uploaded image, it is then checked to see if it is actually a leaf disease or not. If it is a disease then further classification will take place, if it is not a disease then a message will be displayed such as “healthy”.

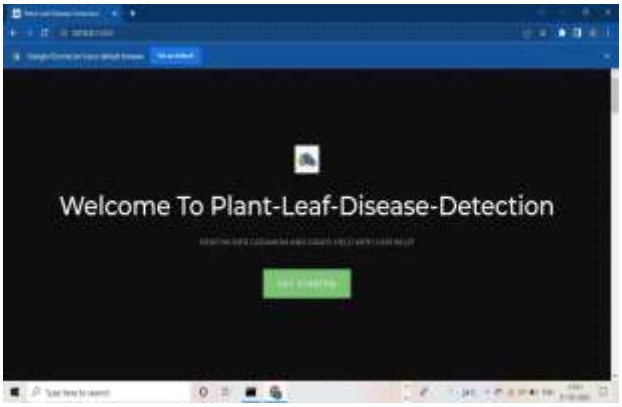
DISEASE CLASSIFICATION

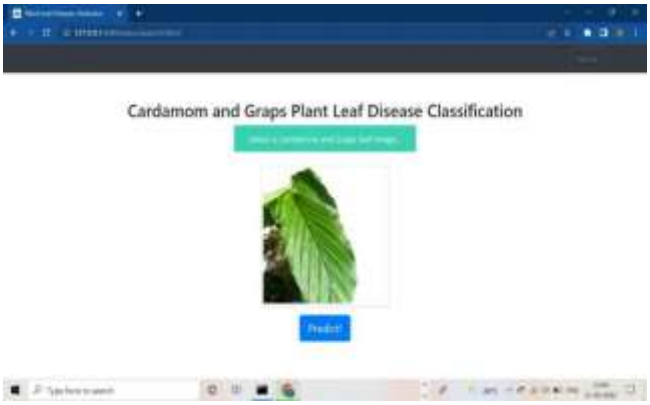
Once the leaf disease is detected, it is then further classified, this classification is done by using machine learning techniques. For the accuracy of classification is used.

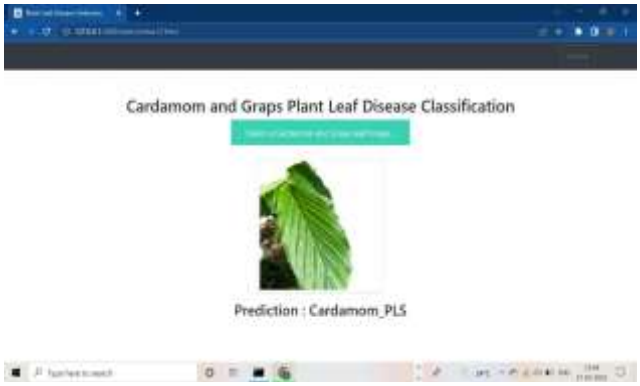
RESULT DIAGNOSIS

After the diagnosis of the disease is done, the name of the disease is mentioned

IV.RESULT







V.CONCLUSION

There are number of ways by which we can detect diseases of plants. Recognizing the disease accurately and efficiently is mainly the purpose of the proposed approach. The experimental results indicate the proposed approach is a valuable approach, which can significantly support an accurate detection of leaf diseases. Alongside the supply of cultivation tools, the farmers also need access to accurate information and they can use for efficient crop management and there is no better way than providing them a service that they can use through the software.

References

[1] *"Automatic plant disease detection using HOG and LBP" Mohammad Aminul Islam, Mustagis Billah -2019*
[2] *"End to end potato leaf disease prediction using Machine Learning" Rony-2021*
[3] *"Image based detection of plant diseases:From classical Machine Learning to Deep Learning journey" Rehan Khan, Khalil Khan -2021*
[4] *"plant disease detection using Machine Learning" Shima Ramesh Maniyath, Vinod P V, Pooja R -2018*
[5] *"plant disease identification based on deep learning algorithm in smart farming" Yan Guo, Wei Wang-2020*
[6] *"plant disease detection using hybrid model based on comvolutional autoencoder and convolutional neural network" Punam Bedi, Pushkar Gole -2021*
[7] *"plant disease detection using Machine Learning" Nilam Bishe, Shreya Kathet, Amara Adgaonkar -2020*
[8] *"plant disease detection and classification by Deep Learning" Lili Li, Shujan Zhang, Bin Wang -2021*
[9] *"A Deep Learning enabled multi class plant disease detection model based on computer vision" Arunabha M.Roy, Jayabrata Bhaduri -2021*
[10] *"Plant infection detection using image processing" SenthilKumar, Meyyappan, Sridhathan Chandra,mouleswaran-2018*