LeafShield: Digital Solutions for Plant Health.

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I. ABSTRACT

Our domain is Computer Vision and sub domain is Image Classification. our problem statement is to detect plant disease by digital image processing . By this project of plant detection, we can detect which plant it is, what are the requirements, any disease just by clicking a pic of that plant, we can come to know about all the details of that plant. This will be much fast detecting process, so that every person can know easily about a plant .

One of the important task in agricultural practices is detection of disease on crops. It requires huge time as well as skilled labor. This paper proposes a smart and efficient technique for detection of crop disease which uses computer vision and machine learning techniques. The proposed system is able to detect 20 different diseases of 5 common plants with 93% accuracy

Plant disease automation in agriculture science is the primary concern for every country, as the food demand is increasing at a fast rate due to an increase in population. Moreover, the increased use of technology today has increased the efficiency and accuracy of detecting diseases in plants and animals. The detection process marks the beginning of a series of activities to fight the diseases and reduce their spread. Some diseases are also transmitted between animals and human beings, making it hard to fight them. For many years, scientists have researched how to deal with the common diseases that affect humans and plants. However, there are still many parts of the detection and discovery process that have not been completed. The technology used in medical procedures has not been adequate to detect all diseases on time,

and that is why some diseases turn out to become pandemics because they are hard to detect on time. Our focus is to clarify the details about the diseases and how to detect them promptly with artificial intelligence

II. INTRODUCTION

In our daily life we used to see a lot of plants and flowers. But in most case we have no knowledge about that plants and flowers. Even we don't know its name. In that case we choose this idea to research and develop our project. Our developed application recognizes the plant in real time by using pictures of a plant. This project is an attempt at using the concepts of neural networks to create an image classifier by TensorFlow. Convolutional neural networks are popular realm of machine learning, and are widely used in image classification. So that we choose this topic to research about image classification by CNN and TensorFlow.

The agricultural land mass is more than just being a feeding sourcing in today's world. Indian economy is highly dependent of agricultural productivity. Therefore in field of agriculture, detection of disease in plants plays an important role. To detect a plant disease in very initial stage, use of automatic disease detection technique is beneficial. Leaves being the most sensitive part of plants show disease symptoms at the earliest. The crops need to be monitored against diseases from the very first stage of their life-cycle to the time they are ready to be harvested. Initially, the method used to monitor the plants from diseases was the traditional naked eye observation that is a time-consuming technique which requires experts to manually monitor the crop fields. In the recent years, a number of techniques have been applied to develop automatic and semi-automatic plant disease detection systems and automatic detection of the diseases by just seeing the symptoms on the plant leaves makes it easier as well as cheaper. These systems have so far resulted to be fast, inexpensive and more accurate than the traditional method of manual observation by farmers

Image segmentation:- is the process of separating or grouping an image into different parts. There are currently many different ways of performing image segmentation, ranging from the simple thresholding method to advanced color image segmentation methods. These

parts normally correspond to something that humans can easily separate and view as individual objects.

PROPOSED SYSTEM :

The process of plant disease detection system basically involves four phases The first phase involves acquisition of images either through digital camera and mobile phone or from web. The second phase segments the image into various numbers of clusters for which different techniques can be applied. Next phase contains feature extraction methods and the last phase is about the classification of diseases.

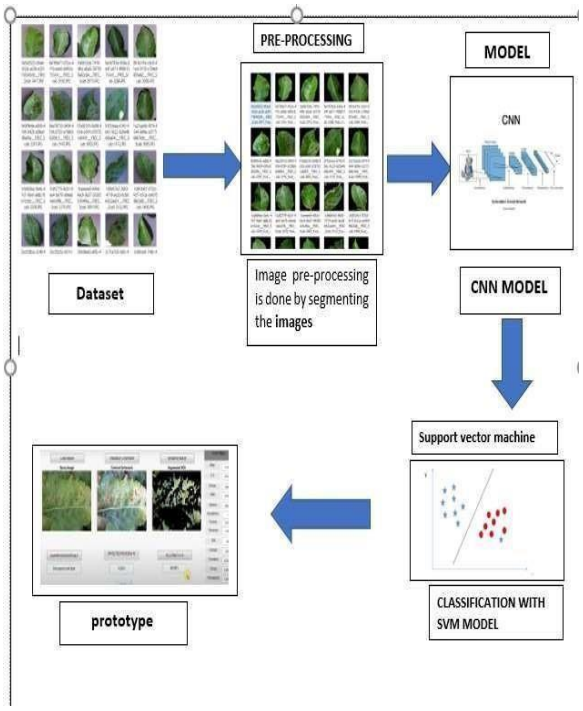
Image Acquisition:-In this images of plant leaves are gathered using digital media like camera, mobile phones etc. with desired resolution and size. The images can also be taken from web. The formation of database of images is completely dependent on the application system developer. The image database is responsible for better efficiency of the classifier in the last phase of the detection system.

Feature Extraction:-In this the features from this area of interest need to be extracted. These features are needed to determine the meaning of a sample image. Features can be based on colour, shape, and texture. Recently, most of the researchers are intending to use texture features for detection of plant diseases. There are various methods of feature extraction that can be employed for developing the system such as gray-level co-occurrence matrix (GLCM), color cooccurrence method, spatial grey- level dependence matrix, and histogram based feature extraction. The GLCM method is a statistical method for texture classification.

Classification:-The classification phase implies to determine if the input image is healthy or diseased. If the image is found to be diseased, some existing works have further classified it into a number of diseases. For classification, a software routine is required to be written in VS Code, also referred to as classifier. A number of classifiers have been used in the past few years by researchers such as k-nearest neighbour (KNN), support

vector machines (SVM), artificial neural network(ANN), back propagation neural network (BPNN), Negatives Bayes and Deci's

5.1 Flow Chart



MODEL:-

CNN MODEL:- It is a type of neural network model which allows us to extract higher representations for the image content.

CNN- It is a convolutional neural network it is a deep neural networks, most commonly it is applied to analyze visual imagery. It is one of the main categories to do images recognition, classification, Segmentation. object detection, recognition faces. In this it takes an input image , process it and classify it. Computer takes Input under pixels and based on image resolution it process the image and classify them.

TECHNIQUES:-

IMAGE SEGMENTATION:- It is the process by which a digital image is partitioned into various subgroups (of pixels) called Image Objects, which can reduce the complexity of the image, and thus analyzing the image becomes simpler.

DATA AUGMENTATION:-It generate different versions of a real dataset artificially to increase its size. Computer vision and natural language processing (NLP) models use data augmentation

strategy to handle with data scarcity and insufficient data diversity.

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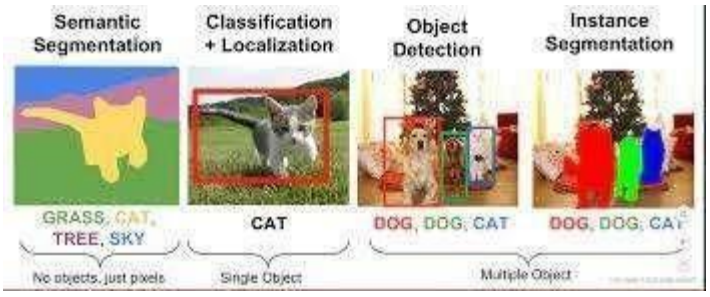

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DISCUSSION :

So in this we can detect a plant disease with a very few easy steps and with out any time waste. And this help a farmer to know the accurate disease and help to take measure in time.

CONCLUSION :

Our project is all about identification of plant Disease. Our developed Web application take the image of a plant and identify the disease it is suffering from. So that it will help the farmers to predict the disease very fast comparing today’s

techniques where they need many skilled labour and required much time. So this web application will reduce both time and also detect accurate disease which helps the farmer to take perfect steps to cure the plant without any help of skilled labour. We have gone through some image processing techniques and used CNN model to complete this project.

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