



## DISEASE DETECTION OF VARIOUS LEAF USING IMAGE PROCESSING TECHNIQUE

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### ABSTRACT :

Identification of the plant diseases is the key to prevent the losses in the yield and quantity of the agricultural product. Leaves being the most sensitive part of plants to show disease symptoms at the earlier stage. Health observation and disease detection on plant is very critical for sustainable agriculture. The method used to monitor the plants from diseases was the traditional naked eye observation that is a time-consuming process, and also it requires tremendous amount of work, expertise in the plant diseases. Hence, image processing is used for the detection of plant diseases by capturing the images of the leaves and comparing it with the database. This database consists of different plants in the image format. The plant leaf for the detection of disease is considered which shows the all disease symptoms. There are many cases where farmers do not have a fully compact knowledge about the crops and the disease that can get affected to the crops. This paper can be effectively used by farmers thereby increasing the yield rather than visiting the expert and getting their advice. The main objective is to detect the plant disease using image processing technology

**INTRODUCTION :** Agriculture has become the key to rise in human civilization it is the art and science of cultivating live stocks and plants. Many of the farmers are not able to identify the diseases in the plants which may lead to loss in agriculture products. A scientist can provide a better solution by using the images and videos of crops that provides a better view. There are many diseases that affects the plants, where the symptoms are not recognizable at the very first stage which may lead to social and economic losses. To make things easier image processing is used, that helps to overcome these kind of situations, by extracting the features of the leaves where the diseases can be easily detected. Image processing involves steps like image acquisition, pre processing, segmentation, feature extraction and classification. Based on the multiple linear regressions a new recognition system of image is proposed. Image segmentation and recognition system consists of the number of innovations. Multiple linear regression and feature extraction are used while creating the recognition system. Evaluation of results has proved that the system has high precision, reliability and image-recognition ability. The results indicate that the approach is beneficial which supports in the detection of the diseases with very less

efforts . A. Image Processing In recent technology researchers are frequently trying to increase the collectively of plants . They have been successful by growing the higher breed seeds and plants. But there are problems that still exist which becomes a main concern while cultivating crop and those are crop diseases and the pesticides problem. Due to such kind of problems, the yield of the crop decreases and hence the country suffers the lack of cultivation of plant [2]. Most of the times diseases needs to be prevented at the very early stage, but if the prevention is not taken in the early stage it may lead to severe damage. To avoid such loses diseases needs to be detected at the early stage .Crop like Corn is being grown in long duration that is 10 to 18 months, that may lead to attack of many diseases . Fungal diseases are the most predominant disease in the corn that appears as small spots on the leaves.

The leaves become totally damaged and completely covered with spots in the case of the severe infections. Frequent use of the pesticides increases level of the toxins in the products which leads to many health diseases and also plays a main role in the contamination of the ground water. In the recent days pesticides price has been increasing day by day. Thus the modern technology helps to enhance the productivity of the crops withless efforts and time consumption.

Three types of diseases that have been taken as model for detection are:

- a. Corn Grey Leaf Spot
- b. Corn Common Rust
- C. Peach Bacterial Spot.

#### **ALGORITHMS USED**

Algorithms used in feature extraction are:

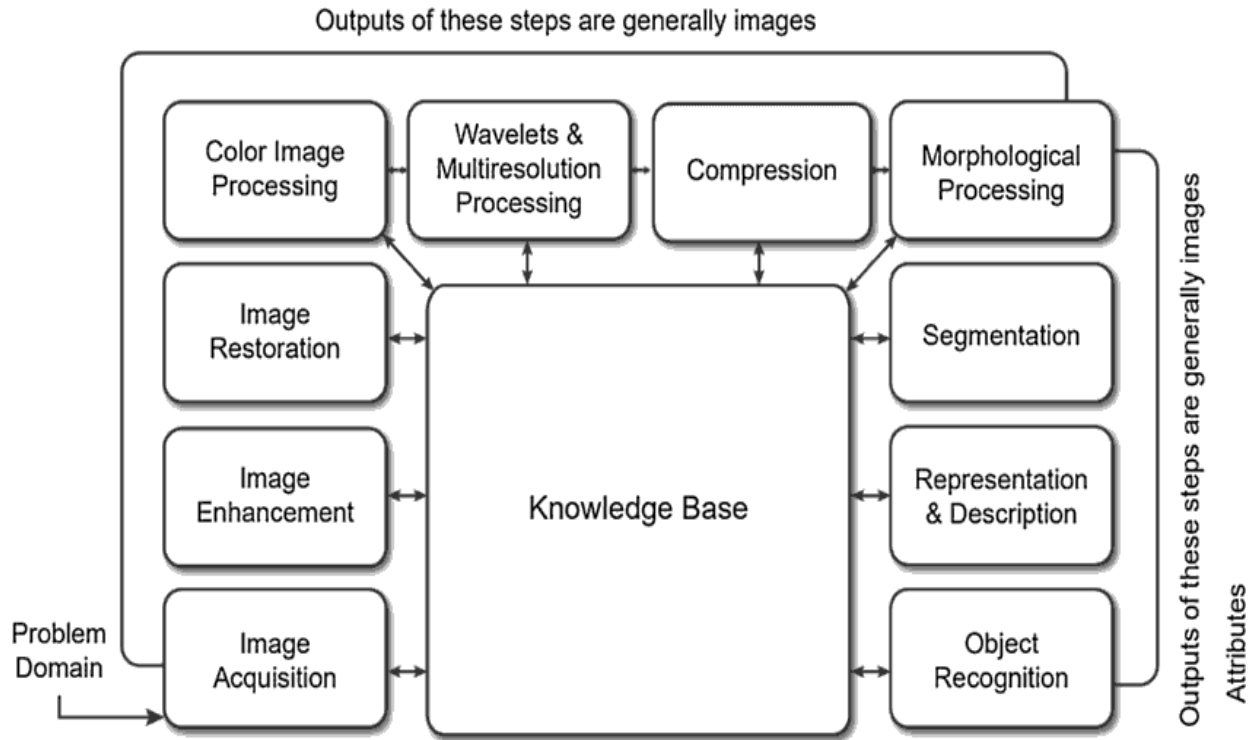
- a. Image Acquisition
- b. Image Sharpening
- c. Edge Detection
- d. Greyscale Image
- e. Adaptive Histogram Equalization
- f. Shape, Color and Texture Features
- g. Support Vector Machine (SVM).

#### **EXISTING SYSTEM:**

Even though there are many systems that have been developed till now using different machine learning algorithms like Random Forest, Naive bayes, Artificial Neural network the accuracy of those models are low and the works using those classification techniques is done with the mind set of detecting disease for only one species of plants. These works have been used in Karnataka by few farmers. Farmers still use naked eyes to detect diseases which is serious problem as a farmer is not aware of what type of disease the plant is infected. Farmers are still facing the issues and the techniques they are using to detect the disease are time consuming. The suggested work focus more on recognition of disease on the corn and peach leaf using Mat lab.

**PROPOSED APPROACH :** The images are contemplated for additional feature extraction, which will be done by using one of the exceeding algorithms. There are numerous characteristics of images which are yet to be drawn out, this initiated method is going to examine a little bit of them. The following Fig.3 shows the system architecture and the authentic progress of the concept. The principal focus of this scheme is to provide assistance to the farmers, facing the loss due to insufficient understanding of numerous diseases. The notion will be more userfriendly.

**FUNDAMENTAL STEPS IN IMAGE PROCESSING:**



**Fig :Fundamental steps in image processing**

**IMAGE ACQUISITION:**  
Image Acquisition is the first step in any image processing system. Image Acquisition involves capturing the images with the help of digital camera

**IMAGE PRE-PROCESSING**

- Image processing is carried out to improve the quality of the image and removed the unwanted noise in image followed by clipping and smoothing of image
- The steps taken to format the images before they are used by the model training and interference here image is resized to 256\*256

**IMAGE SEGMENTATION**

- The procedure of dividing a digital image into various fragments is known as Image Segmentation.

- It assign a label to every pixel in a image such that pixels with the same label share certain characteristics. Every pixel in a zone is close regarding to some distinctive or determined attributes like color, shape and texture

### RANDOM FOREST ALGORITHM :

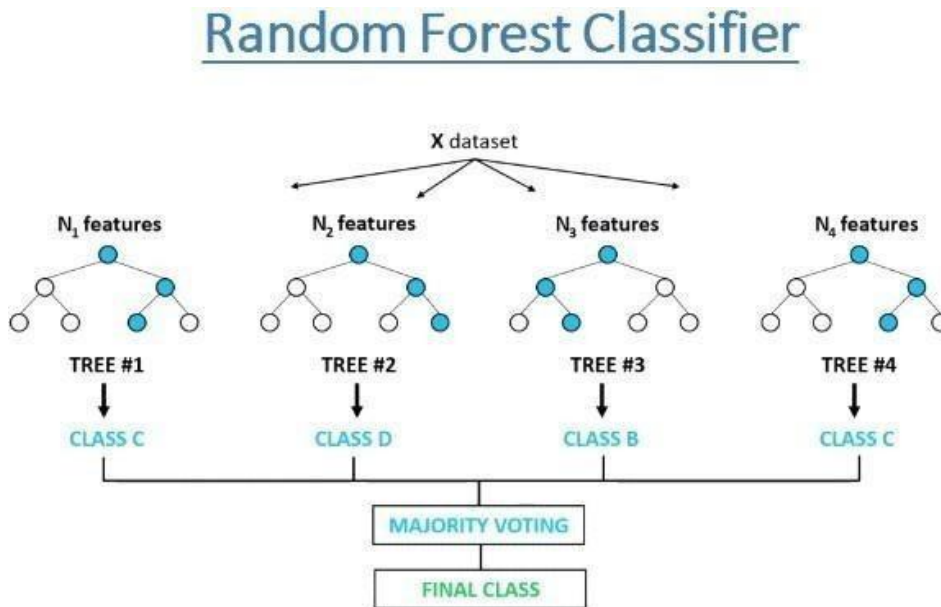


Fig :Random forest classifier

Random forest is a supervised machine learning algorithm. It is one of the most used algorithms due to its accuracy, simplicity, and flexibility. The fact that it can be used for classification and regression tasks, combined with its nonlinear nature, makes it highly adaptable to a range of data and situations. It is based on the concept of ensemble learning, which is a process of combining multiple classifiers to solve a complex problem and to improve the performance of the model. Random Forest is a classifier that contains a number of decision trees on various subsets of the given dataset and takes the average to improve the predictive accuracy of that dataset. Instead of relying on one decision tree, the random forest takes the prediction from each tree and based on the majority votes of predictions, and it predicts the final output.

### DISADVANTAGES:

- The implementation still lacks in accuracy of results in some causes
- Database extension is need in order to reach the more accuracy
- Very few diseases have been covered. Sowork need to be extended to cover more diseases.

### FUTURE SCOPE:

The main goal for the future project is to develop a complete system comprising a trained model on the server, as well as an application for mobile phones that display recognized diseases in fruits, vegetables, and other plants based on photographs taken rom the phone camera

This application will aid farmers by facilitating the recognition and treatment of plant diseases in a timely manner and help them make informed decisions when utilizing chemical pesticides.

### CONCLUSION:

The proposed system detects the diseases that affect rice plant leaves which in turn help the farmers to save the crops in the early stage SVM+HOG with polynomial kernel function can be used to detect other diseases in rice leaves as well as the leaves of other plants • Early stage plant disease detection will help the farmers to save the plants.

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