



# Plant Disease Analysis Using Leaf Image By Machine Learning

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**Abstract:** Leaf sickness recognizable proof is huge work in agribusiness field. The hypothetical of the proposed model is proper simulated intelligence portrayal technique with an ideal accuracy appeared differently in relation to other state of the art strategy. AI computations are made to recognize the plant defilement or sickness by perceiving the assortment part of the leaf region. This paper figure out various methodology in perceiving among sound and debilitated leaf from the instructive files made. Machine sorting out some way to set up the colossal educational assortments open unreservedly gives us a sensible technique for distinguishing the disorder present in leaf.

**Keywords :** Leaf Disease, Fertilizer

## I. INTRODUCTION

Plant affliction ID by visual way is more exhausting task and at the same time less exact and ought to be conceivable simply in limited locales. While expecting customized figure strategy is used it will require less tries, not such a lot of speculation yet rather more exactly. In plants, a couple of general diseases are brown and yellow spots, early and late sear, and other parasitic, viral and bacterial disorders.

The farming expanse of land is something beyond being a taking care of obtaining in this day and age. Indian economy is profoundly reliant of agrarian efficiency. Hence in field of farming, location of sickness in plants assumes a significant part. To identify a plant illness in exceptionally beginning stage, utilization of programmed sickness identification method is helpful. The current technique for plant infection location is just unaided eye perception by specialists through which recognizable proof and identification of plant illnesses is finished. For doing as such, a huge group of specialists as well as ceaseless observing of plant is required, which costs extremely high when we do with enormous ranches. Simultaneously, in certain nations, ranchers don't have legitimate offices or even thought that they can contact to specialists. Because of which counseling specialists even expense high as well as tedious as well. In such circumstances, the recommended strategy ends up being helpful in checking huge fields of yields. Programmed discovery of the infections simply by seeing the side effects on the plant leaves makes it simpler as well as less expensive. This additionally upholds machine vision to give picture based programmed process control.

## II. LITERATURE REVIEW

A. **Prof. Sanjay B. Dhaygude, Mr. Nitin P. Kumbhar “ Agricultural plant Leaf Disease Detection Using Image Processing ”, explained by in this paper,**

The detection of plant leaf is an very important factor to prevent serious outbreak. Automatic detection of plant disease is essential research topic. Most plant diseases are caused by fungi, bacteria, and viruses. Fungi are identified primarily from their morphology, with emphasis placed on their reproductive structures. Bacteria are considered more primitive than fungi and generally have simpler life cycles. With few exceptions, bacteria exist as single cells and increase in numbers by dividing into two cells during a process called binary fission. Viruses are extremely tiny particles consisting of protein and genetic material with no associated protein. The term disease is usually used only for the destruction of live plants. The developed processing scheme consists of four main steps, first a color transformation structure for the input RGB image is created, this RGB is converted to HSI because RGB is for color generation and HSI for color descriptor. Then green pixels are masked and removed using specific threshold value, then the image is segmented and the useful segments are extracted, finally the texture statistics is computed from SGDM matrices. Finally the presence of diseases on the plant leaf is evaluated.



**B. Sunil S.Harakannavar ,jayashri M.Rudagi, Veena I Puranikmath,R Pramodhini ,”Plant leaf disease detection using computer vision and machine learning algorithms” , explained by in this paper,**

Agriculture provides food to all the human beings even in case of rapid increase in the population. It is recommended to predict the plant diseases at their early stage in the field of agriculture is essential to cater the food to the overall population. But it is unfortunate to predict the diseases at the early stage of the crops. The idea behind the paper is to bring awareness amongst the farmers about the cutting-edge technologies to reduce diseases in plant leaf. Since tomato is merely available vegetable, the approaches of machine learning and image processing with an accurate algorithm is identified to detect the leaf diseases in the tomato plant. In this investigation, the samples of tomato leaves having disorders are considered. With these disorder samples of tomato leaves, the farmers will easily find the diseases based on the early symptoms.

Firstly, the samples of tomato leaves are resized to  $256 \times 256$  pixels and then Histogram Equalization is used to improve the quality of tomato samples. The K-means clustering is introduced for partitioning of dataspace into Voronoi cells. The boundary of leaf samples is extracted using contour tracing. The multiple descriptors viz., Discrete Wavelet Transform, Principal Component Analysis and Grey Level Co-occurrence Matrix are used to extract the informative features of the leaf samples. Finally, the extracted features are classified using machine learning approaches such as Support Vector Machine (SVM), Convolutional Neural Network (CNN) and K-Nearest Neighbor (K-NN). The accuracy of the proposed model is tested using SVM (88%), K-NN (97%) and CNN (99.6%) on tomato disordered samples.

**C. Shima Ramesh, Ramachandra Hebbar, Niveditha M, Pooja R, “Plant Disease Detection Using Machine Learning” , explained by in this paper,**

Crop diseases are a noteworthy risk to sustenance security, however their quick distinguishing proof stays troublesome in numerous parts of the world because of the non attendance of the important foundation. Emergence of accurate techniques in the field of leaf-based image classification has shown impressive results. This paper makes use of Random Forest in identifying between healthy and diseased leaf from the data sets created. Our proposed paper includes various phases of implementation namely dataset creation, feature extraction, training the classifier and classification.

The created datasets of diseased and healthy leaves are collectively trained under Random Forest to classify the diseased and healthy images. For extracting features of an image we use Histogram of an Oriented Gradient (HOG). Overall, using machine learning to train the large data sets available publicly gives us a clear way to detect the disease present in plants in a colossal scale.

### III. DESIGN METHODOLOGY

Name of models use in our system:

- 1. Login :**  
In login page , user can simply login by his/her login id. If not then he/she should create user id with the help of register page.
- 2. Register :**  
In register page ,we have provide option to user, to create his/her login id.
- 3. Find Leaf Disease :**  
In this page, by uploading and submitting img we get to know whether leaf is diseased or not.
- 4. Get Fertilizer Name :**  
In Fertilizer page ,we get the details about the pesticides which is going to use to prevent the plant according to diseases
- 5. View History :**  
We can get the search history with the help of this page.



IV. SYSTEM ARCHITECTURE

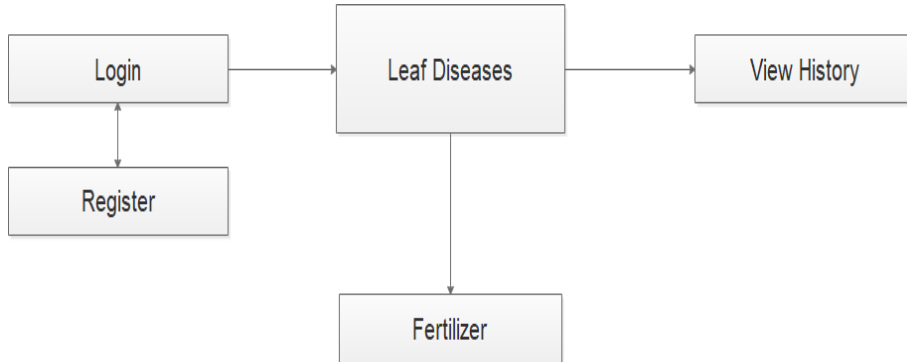
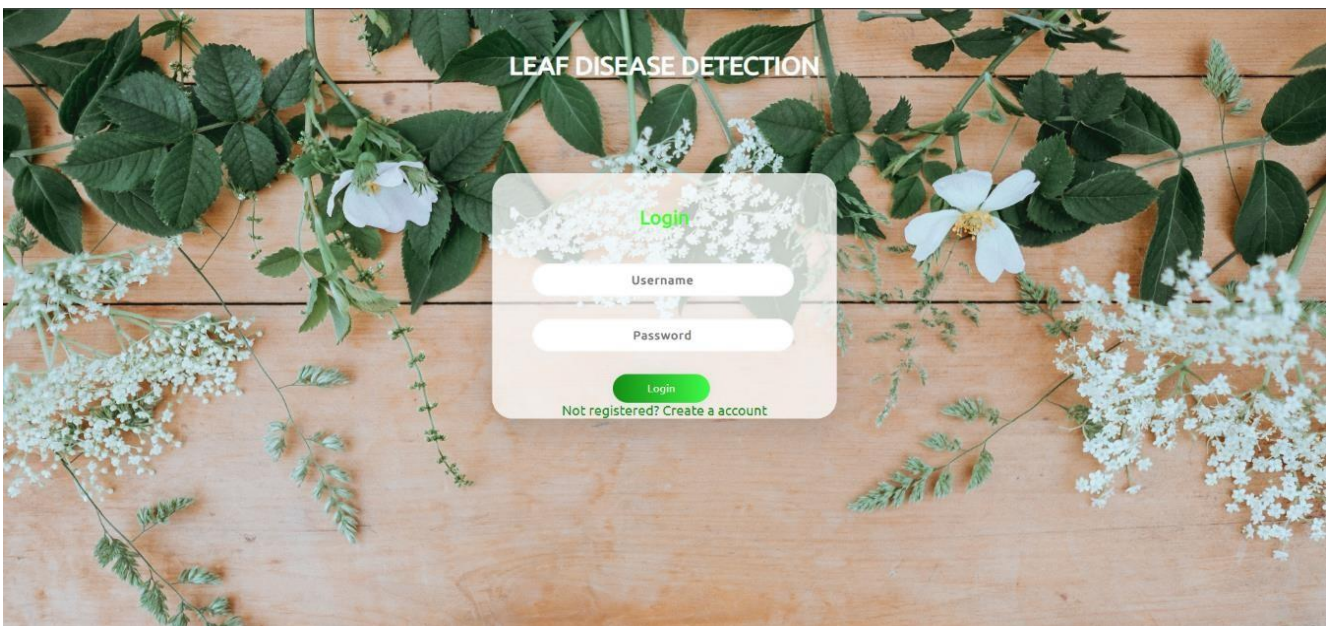


Fig. 1 System Architecture

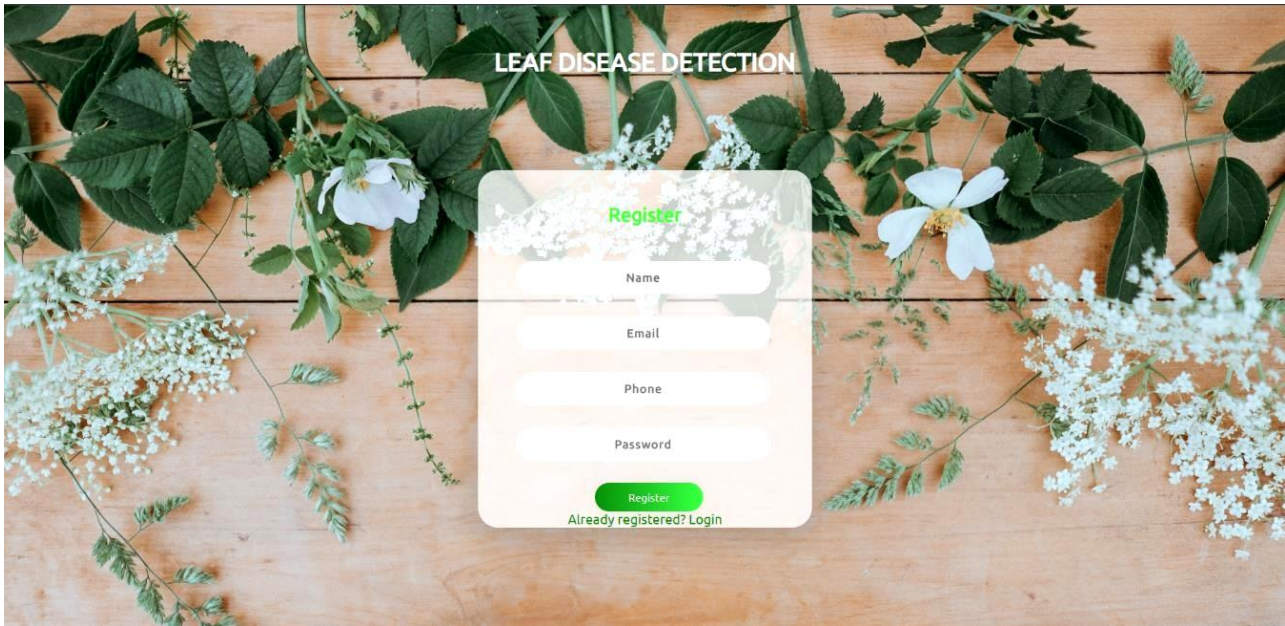
In System Architecture we shortly describe the entire process of our work. The contents are as follow :

- A. **Login** : The User should login if he/she is already register.
- B. **Register** : If the user is newly here he/she should register to get the access.
- C. **Leaf Disease** : After Login he/she need to Upload image of affected plant leaf so he/she could get the disease information according to dataset.
- D. **Fertilizer** : After getting the disease information he/she should also get preventive measures according to diseases.
- E. **View History** : He/she Should also get the history of previous work.

V. RESULT



Login Page



**Sign Up Page**



**Home Page**



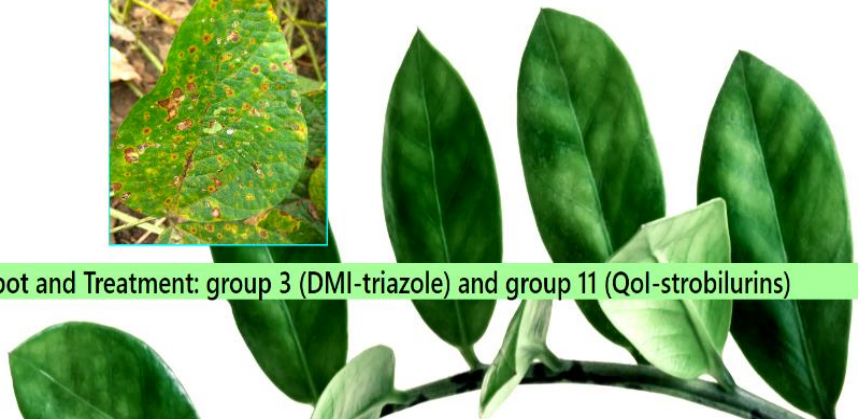
LEAF DISEASE DETECTION

BACK

Drop images here



Disease Name: Frog-eye Leaf Spot and Treatment: group 3 (DMI-triazole) and group 11 (QoI-strobilurins)



Result : Frog-eye Leaf Spot

LEAF DISEASE DETECTION

BACK

Drop images here



Disease Name: Yellow Mosaic and Treatment: Thiamethoxam or Methyl demeton



Result : Yellow Mosaic



LEAF DISEASE DETECTION

BACK

Drop images here



Disease Name: Rust and Treatment: Triazoles

Result : Rust

LEAF DISEASE DETECTION

BACK

Drop images here



Healty Plant

Result : Healty Leaf



## **VI. CONCLUSION**

In this endeavor, one more approach of using significant learning method was examined to therefore request and perceive plant infections from leaf pictures. The made model had the choice to distinguish leaf presence and perceive strong leaves and different diseases, which can be obviously investigated.

## **VII. FUTURE PROSPECTS**

Infection recognition, measurement, arrangement and expectation are such difficult spaces as they contain many changing boundaries. Because of its tremendous, erratic nature consideration of the most recent AI and huge information strategies will be a significant improvement and an undeniable development. The incorporation of IoT related structure will likewise flaunt the work and upgrade the presentation results.

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