# Disease Detection System for Grape leaf

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**Abstract**

*It is challenging for human eye to detect the exact form of leaf disease which occurs on the leaf of plant. Thus, in order to identify the leaf diseases accurately, the use of image processing and machine learning techniques can be helpful. The images used for this work were acquired from the cotton field using digital camera. In pre-processing step, background removal technique is applied on the image in order to remove background from the image. Then, the background removed images are further processed for image segmentation using Otsu thresholding technique. Different segmented images will be used for extracting the features such as color, shape and texture from the images. At last, these extracted features will be used as inputs of classifier. Plant diseases cause significant damage and economic losses in crops. Subsequently, reduction in plant diseases by early diagnosis results in substantial improvement in quality of the product. Erroneous diagnosis of disease and its severity leads to inappropriate use of pesticides. The goal of proposed work is to identify the disease with image processing of grape plant leaf. In the proposed system, grape leaf image with complex background is taken as input. Thresholding is deployed to mask green pixels and image is processed to remove sound using anisotropic diffusion. Then grape leaf sickness segmentation is done. The diseased serving from segmented images is recognized.*

*Keywords- Leaf sicknesses, Image pre-processing, Image subdivision, Segmentation.*

## I. INTRODUCTION

The conception is projected for the detection of numerous unwellness affected area unites in leaf misuse k suggests that agglomeration algorithmic program and artificial neural networks supported the coaching of the leaf pictures in serial information that various images of leaves are soft on the unwellness affected leaves, the pictures area unit threshold to explicit values then detected image threshold area unit covert over the initial image. The aim of this project is to style, implement and appraise a image process software system based mostly resolution for automatic detection and classification of plant disease. But studies show that observing forward to pure eye observation of consultants to discover and classify diseases will be time overwhelming and high-ticket, particularly in rural areas and emerging countries. Thus we have a tendency to gift quick; automatic, low cost and correct image process based mostly resolution. Resolution consists of 4 main sections; within the initial phase we have a tendency to yield a color transformation structure for the RGB leaf image then, we have a tendency to apply color area change for the color transformation structure. Next, within the second section, the pictures area unit divided exploitation technique. Within the third unit, we have a tendency to calculate the feel options for the separated infected objects.

## II.PROBLEM STATEMENT

Diseases are impairment to the normal state of the plant that modifies or disturbs its vital functions such as photosynthesis, transpiration, pollination, fertilization, dissemination etc. These diseases are instigated by pathogens viz. fungi, bacteria and viruses, and due to adverse environmental conditions. Therefore, the early stage diagnosis of plant disease is an important task. Farmers require continuous monitoring of experts which might be prohibitively expensive and time consuming. Therefore looking for fast, less expensive and accurate technique to mechanically spot the diseases from the indications that appear on the plant leaf is of great truthful significance.

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## III.LITERATURE REVIEW

**Paper name:**Plant Disease Detection Using Leaf Pattern: A Review(2015)
**Authors:** Vishnu S, A. Ranjith Ram.
In this review paper we have a tendency to converse the assorted methodologies for sickness detection. Studies show that hoping on pure naked-eye observation of specialists to notice and classify diseases is time overwhelming and high-ticket, particularly in rural areas and developing countries. thus we have a tendency to gift quick, automatic, low price and correct image procedure primarily based resolution. resolution consists of 4 main parts; within the 1st phase we have a tendency to produce a color change structure for the RGB leaf image then, we have a tendency to apply color house transformation for the colour transformation structure. Next, within the second part, the pictures ar divided exploitation the K-means bunch technique. within the third part, we have a predisposition to calculate the feel choices for the divided infected objects. Finally, within the fourth part the mined options ar versed a pre-skilled neural network.

**Paper name:** Detection of Diseases on Cotton Leaves Using K Mean Clustering Method(2015)
**Authors:** Pawan P. Warne, Dr. S. R. Ganorkar
This paper presents Associate in Nursing approach for cautious detection of diseases, identification and timely handling to forestall the crops from significant losses. The diseases on the cotton square measure essential issue that makes the sharp decrease within the production of cotton. thus for the study of interest is that the leaf instead of whole shrub as a result of concerning 8595 capitalize on diseases occurred on the cotton leaves like Alternaria,Cercospora and Red Leaf Spot. during this proposal at the start preprocessing the input image victimization bar graph feat is applied to extend the distinction in low distinction image, K means that clump rule is employed for subdivision that classifies objects supported a group of options into K variety of groups and at last classification is performed victimization Neural network. therefore image process technique is employed for detection diseases on cotton leaves early and accurately. it's accustomed analyze the cotton diseases which is able to be helpful to farmers.

## IV. ALGORITHM

**SIFT Algorithm**

There are mainly four steps involved in SIFT algorithm. We will see them one-by-one.

**1. Scale-space Extreme Detection**

From the image above, it is obvious that we can't use the same window to detect key points with different scale. It is OK with small corner. But to detect larger corners we need larger windows. For this, scale-space sifting is used.

**2. Key point Localization**

Once potential key points locations are found, they have to be refined to get more accurate results. They used Taylor series expansion of scale space to get more accurate place of extrema, and if the intensity at this extrema is less than a threshold values it is rejected. This threshold is called **contrast Threshold** in OpenCV If this ratio is greater than a threshold, called **edge Threshold** in OpenCV, that key point is discarded.

**3. Orientation Assignment**

Now an orientation is assigned to each key point to achieve invariance to image rotation. A neighborhood is taken around the key point location depending on the scale, and the gradient magnitude and direction is calculated in that region. It creates key points with same location and scale, but different directions. It donates to stability of matching.

**4. Key point Descriptor**

Now keypoint descriptor is created. A 16x16 neighborhood around the keypoint is taken. It is divided into 16 sub-blocks of 4x4 size. For each sub-block, 8 bin orientation histogram is created. So a total of 128 bin values are available. It is represented as a vector to form keypoint descriptor. In addition to this, several measures are taken to achieve sturdiness against illumination changes, rotation etc.

**5. Keypoint Matching**

Keypoints between two images are matched by identifying their adjacent neighbor's. But in some cases, the second closest-match may be very near to the first. It may happen due to noise or some other reasons. In that case, ratio of closest-distance to second-closest distance is taken. If it is greater than 0.8, they are rejected. It eliminators around 90% of false matches while discards only 5% correct matches, as per the paper.

So this is a immediate of SIFT algorithm. For more details and understanding, reading the original paper is highly recommended. Remember one thing, this algorithm is patented. So this algorithm is included in Non-free module in OpenCV.

**A. BLOCK DEIAGRAM OF SYSTEM**

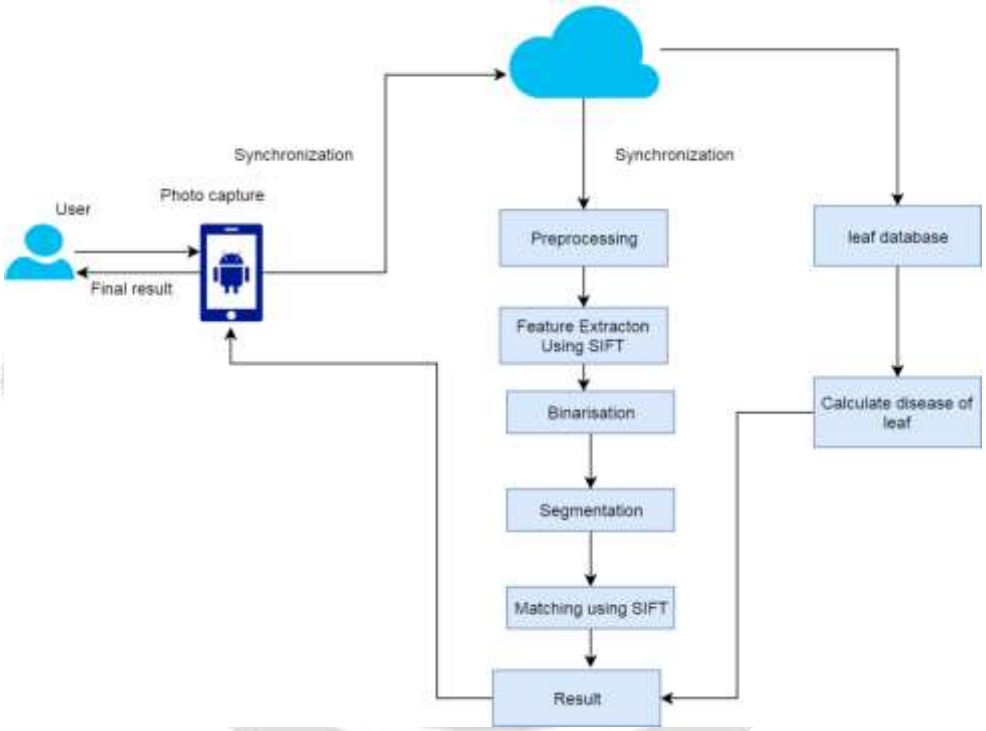


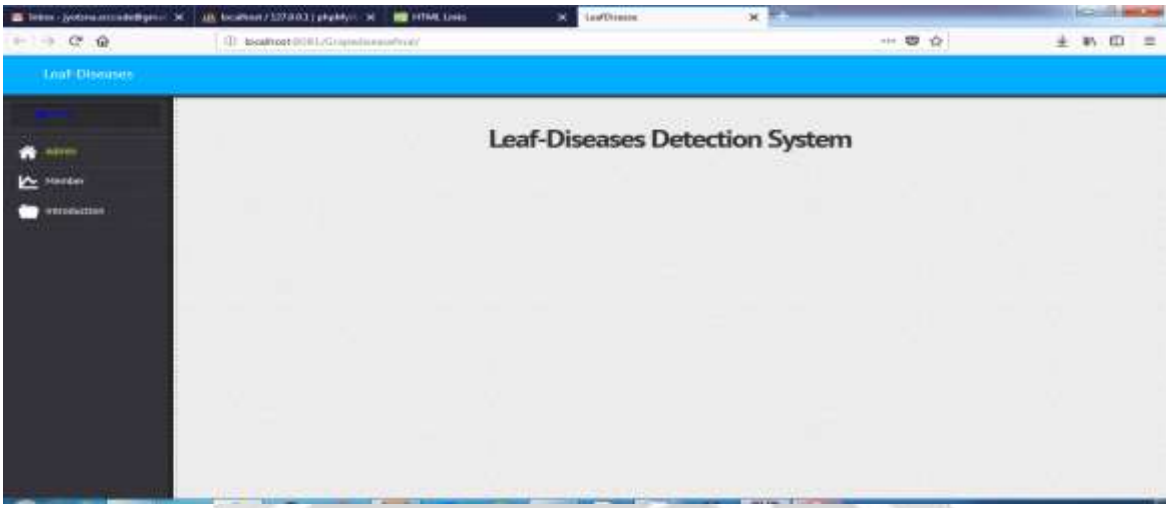

Figure. System Architecture

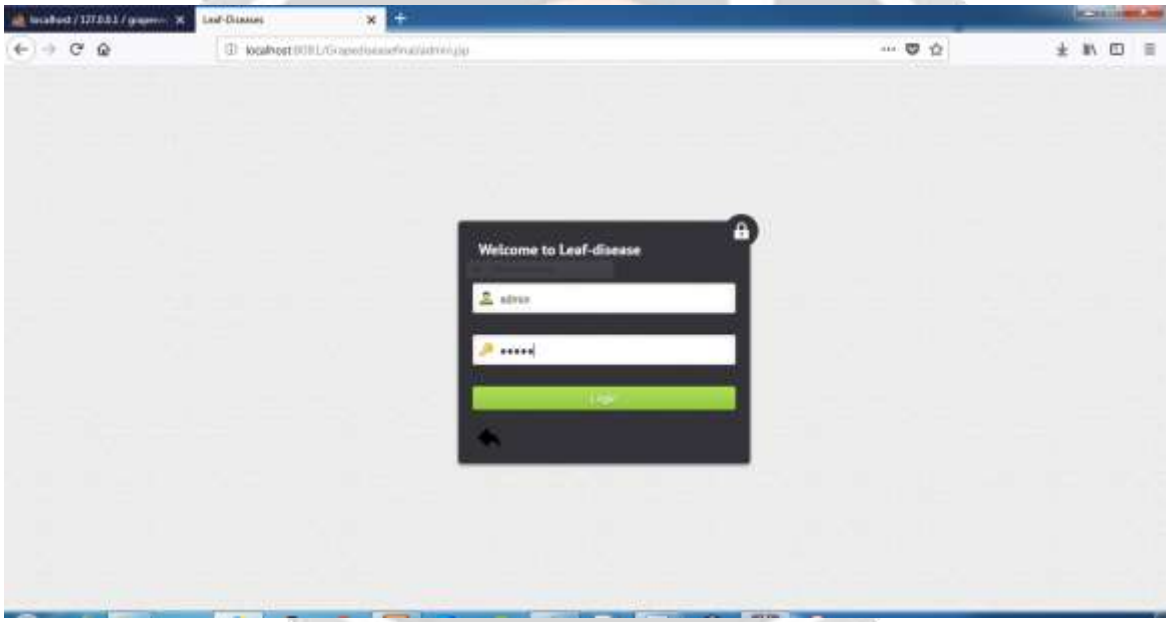
For analysis of grapes leaf sickness we device the collection which can notice the diseases that occur on leaf so that farmer should have to aware of it before disease spread ob leaves.

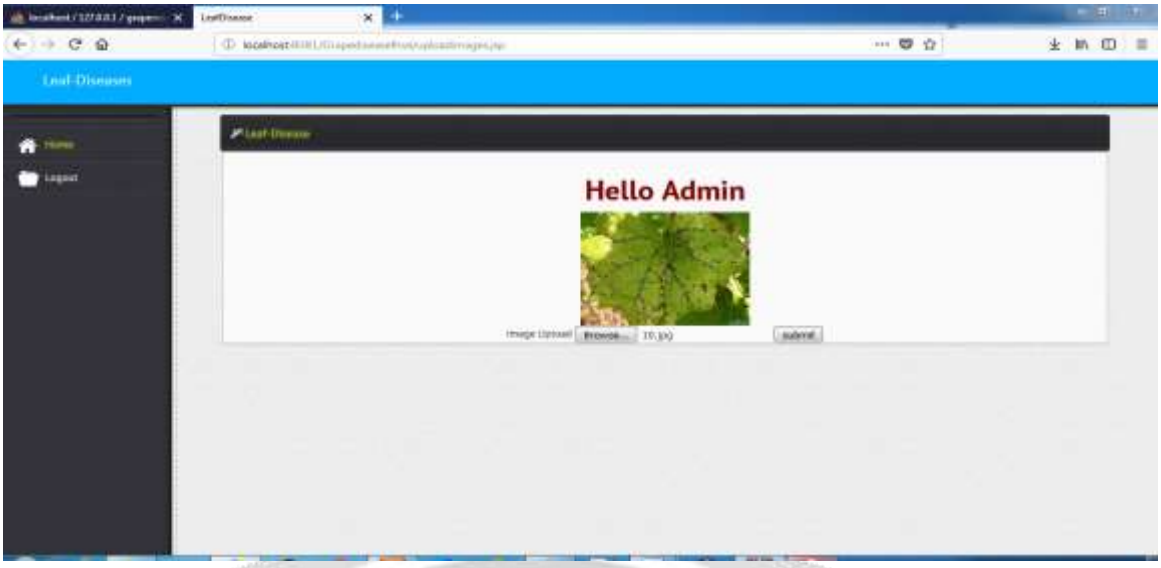
**V. SCOPE OF PROJECT**

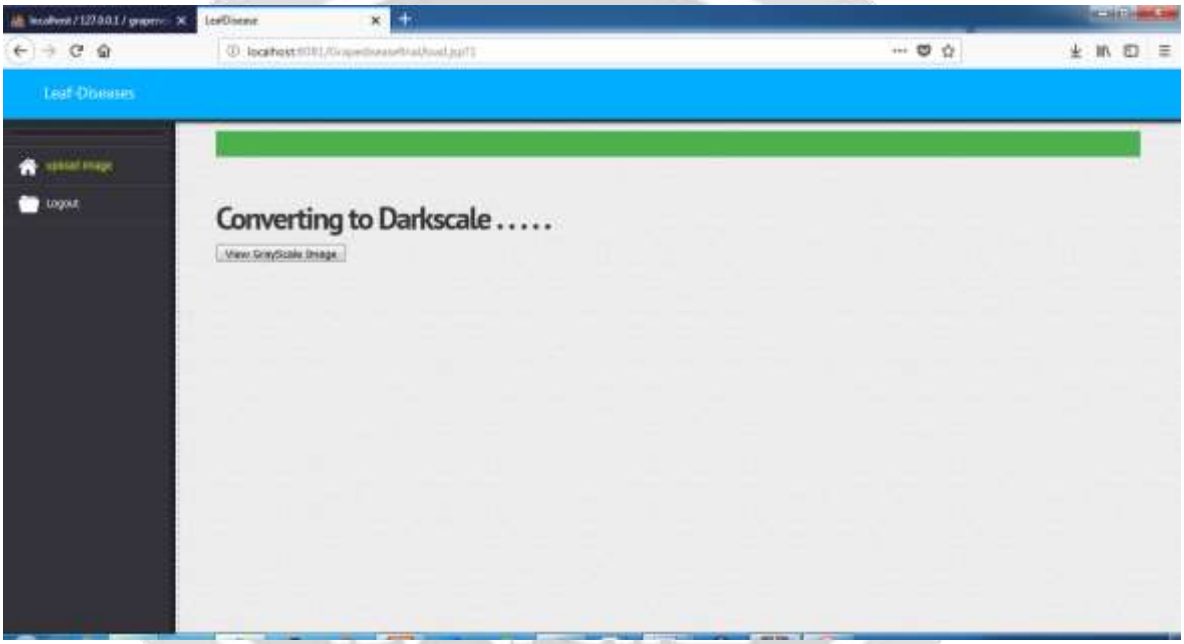
This methods use in farm at dissimilar location, farming labs.

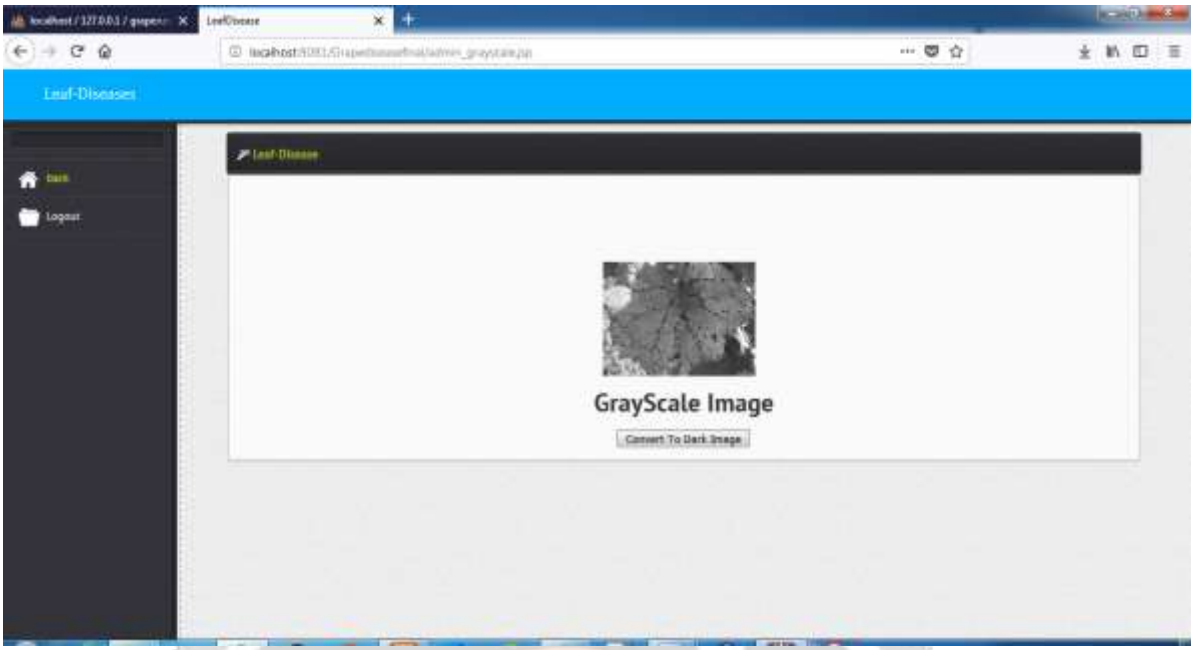
## VI. RESULT ANALYSIS

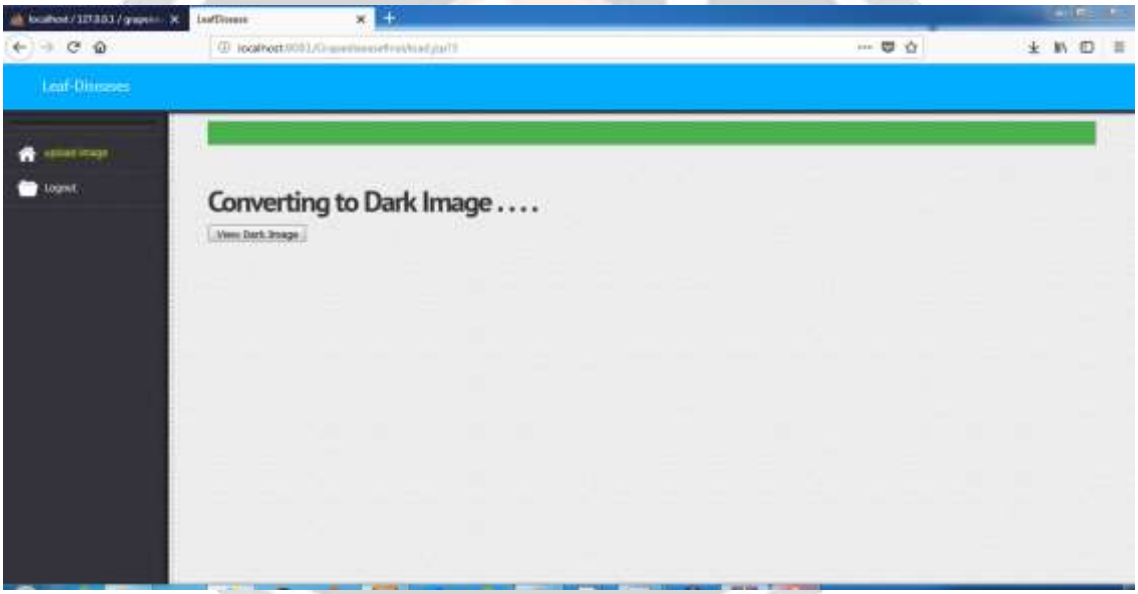


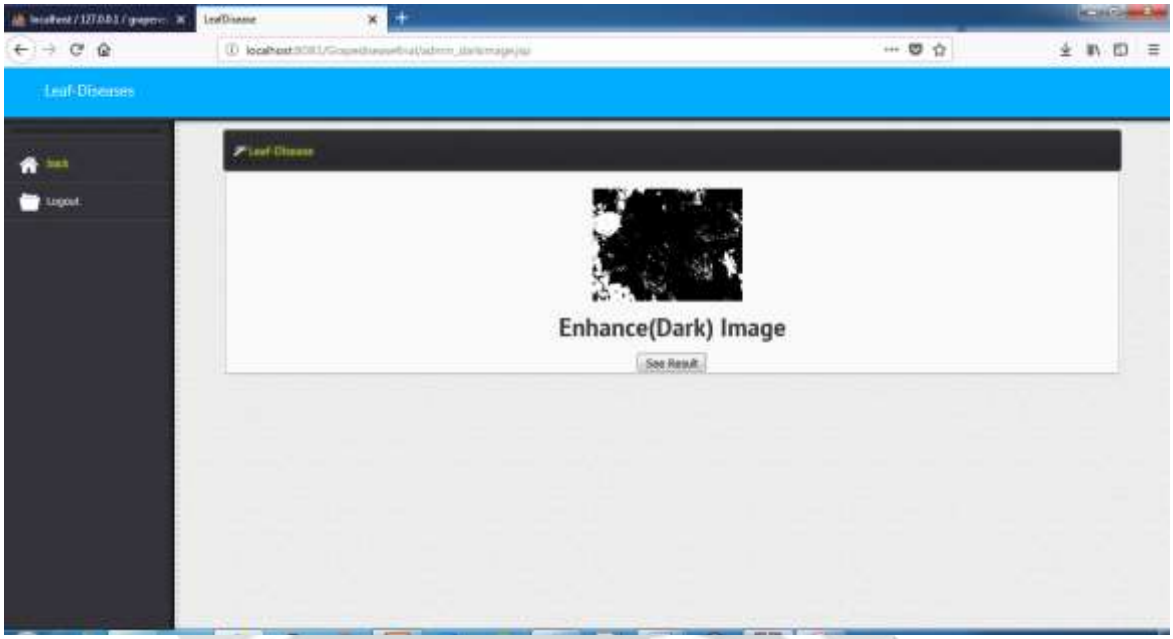



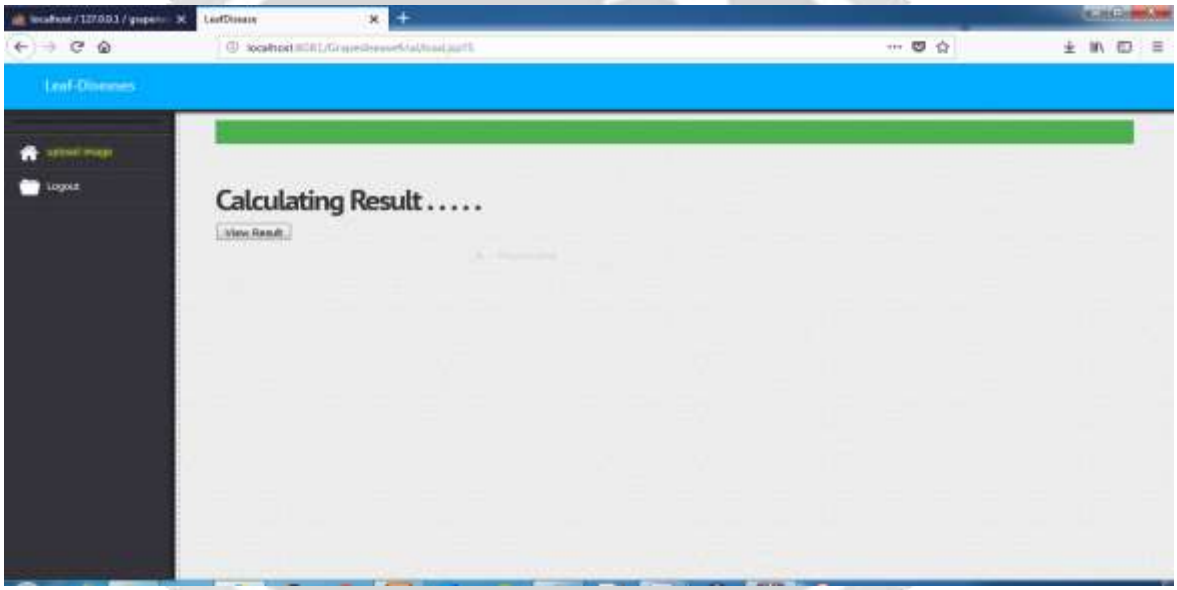

Leaf-Diseases
Hello Admin

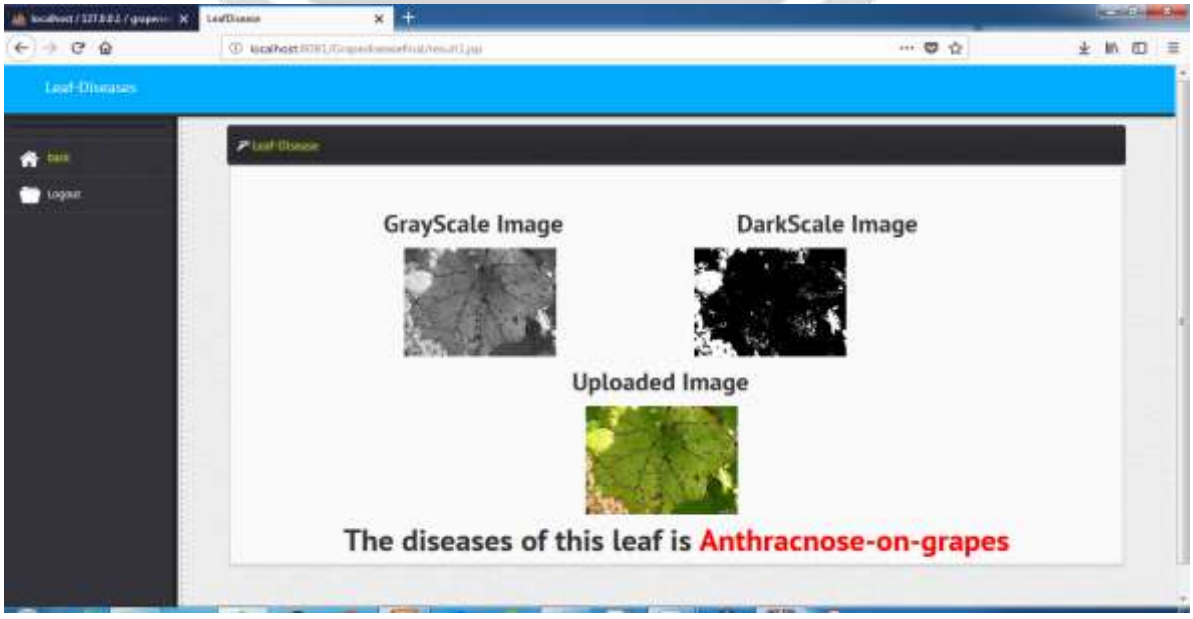

Leaf-Diseases
Logout
Converting to Darkscale . . . . .


Leaf-Diseases
Logout
GrayScale Image


Leaf-Diseases
Converting to Dark Image . . . .


Leaf-Diseases
Enhance(Dark) Image


Leaf-Diseases
Calculating Result . . . . .


Leaf-Diseases
GrayScale Image
DarkScale Image
Uploaded Image
The diseases of this leaf is Anthracnose-on-grapes

## VII. CONCLUSION

In this project, die rent phases of image process were applied on respiratory organ Nodules. From these die rent image process techniques, the fuzzy later can give the e cientdenoising. Segmentation done by marker based mostly crunch formula, offers numerous region of image. GLCM is employed to extract the die rent options of image and that takes less time for generating the result. This results are more matured SVM Classier, that classiest the nodules as benign or malignant. SVM classier delivers ninety two. 5 % accuracy.

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