

A Review Paper On A New System For Diagnosis And Identification Of Plant Diseases By Using PyCharm And Python

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Abstract: Agriculture now serves much more purposes than just providing food for an expanding population. Wherever an Asian population exceeds seventy percent, it is crucial. Agriculture is a country's main industry. It therefore feeds a wide variety of people. In the first place, disease-related reduced crop quality must be taken into account. The key to preventing agricultural losses may be disease detection. The purpose of this project is provide to a software solution that mechanically locates and categorises sickness. Illness detection is involved in steps including loading an image, pre Processing, segmentation, extraction, and classification. Images of the leaves are used to identify plant illnesses. Therefore, it is useful to apply image processing techniques to identify and categorise diseases in agricultural applications. Index Terms: Random Forest, Image Processing.

Keywords: Plant disease classification, detection, and machine learning.

I. INTRODUCTION

One of the most important agricultural procedures is the early identification and classification of crop plant diseases. Disease-related infection causes a substantial economic loss to the Every year, farmers come. Therefore, a prompt, accurate, and timely identification of the illness both reduces the risk of product loss and raises the product's quality (Phadikar et al., 2013). As a result, it aids in the nation's economic development. In conventional methods, the diagnosis of these illnesses is based either on the pathogens' visible symptoms or on pathogen identification in a lab (Barbedo, 2016). Pests and diseases cause crops or parts of plants to be destroyed, which lowers food output and increases food insecurity. Additionally, expertise in pest management Various less developed nations have better illness control. One of the main causes of decreased food production is toxic pathogens, poor disease control, and dramatic climate changes. In order to reduce post-harvest processing, strengthen agricultural sustainability, and increase production, numerous new technologies have arisen.

II. PROPOSED WORK

The suggested method intends to create a system for automatically identifying leaves or fruits and classifying diseases in diverse fruits and plants. There are two categories for the system. phases: the training phase, which comprises the acquisition, preprocessing, and computation of the percentage of infection from test images as well as feature extraction, segmentation, and classification.

Image capture: Using a camera, a picture of a plant leaf or fruit is taken. The image that is captured will be an RGB file. If necessary, a picture's scale and colour change should be done during image pre-processing. Preprocessing is the process of preparing an image for later processing by removing noise or extracting the region of interest. This project makes use of Using segmentation, the region of interest can be extracted from the input image.



Fig. 1. Bacterial Blight Image.

Segmentation: Segmentation is the process of splitting an input image into various parts with some pixel similarity and shared characteristics. Segmentation is frequently used to determine the boundaries. We can obtain the region of interest with which to continue the processing by segmenting the input image. For the system depicted in Fig. 2, which is one of the most accurate segmentation techniques, we are using grab cut segmentation.

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Segmentation: Segmentation is the process of splitting an input image into various parts with some pixel similarity and shared characteristics. Segmentation is frequently used to determine the boundaries. After masking the background pixels, the programme will use the information we provided to predict the colour distribution of the foreground pixels using the Gaussian mixture model (GMM).

According to their relationship to nearby pixels, unknown pixels in a Gaussian mixture model are classified as either probable foreground or background, creating a new pixel distribution. Calculating the weights between the pixels allows one to determine how similar two pixels are. The edges between pixels will be concealed if there is a significant variation between their values. Extraction of features: Extraction of features is essential for correctly identifying an object. Color, mean, homogeneity, standard deviation, variance, correlation, entropy, edges, etc.



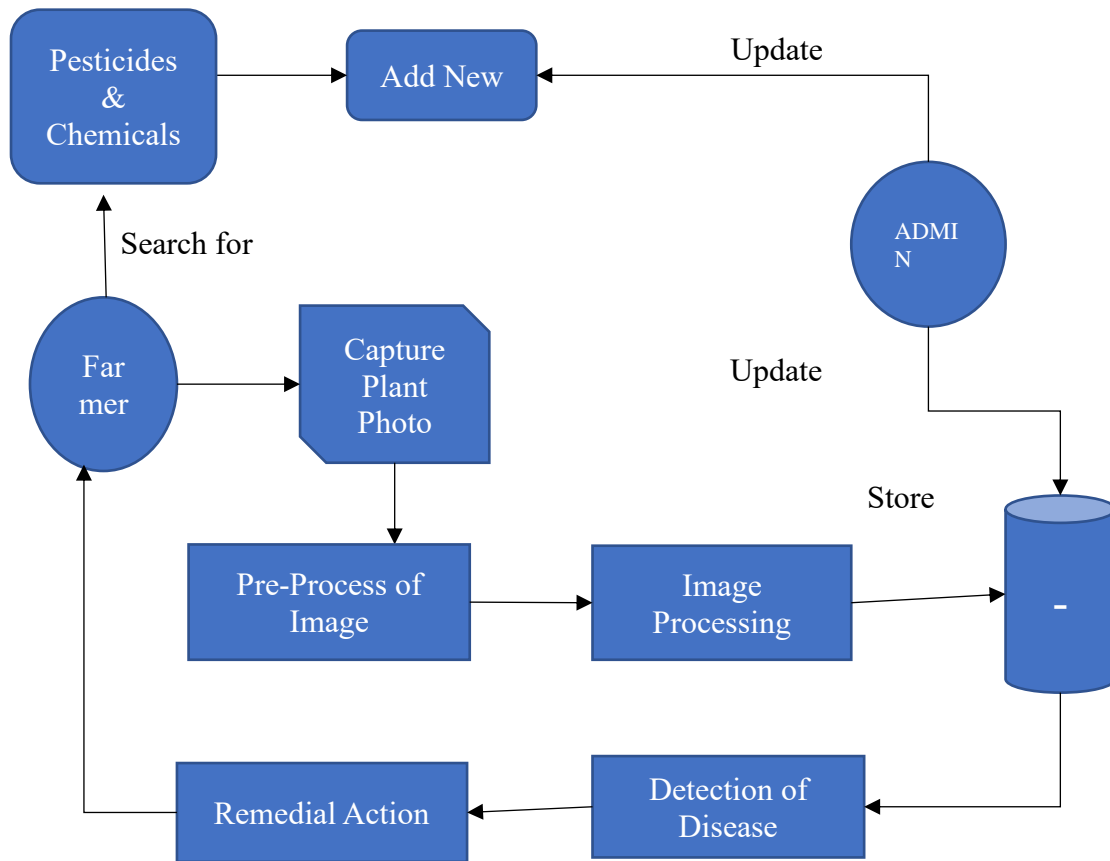
Fig. 2. Segmented Image

One technique for identifying the bacterial blight disease in pomegranates is edge detection. The fruit's cracks show that there is bacterial blight present. Fig presents the edge-detected image. Edge detection can be used to locate the edges in the cut sections of pomegranate fruits that have large cuts and cracks due to the bacterial blight disease. The chopped portions make the edges quite noticeable. We fix a problem based on the amount of edge detected areas Image data is compared to the permanent database in this data comparison. As previously indicated, a permanent database indicates that the picture has various dazzling pixels, we deduce the presence of bacterial blight based on the number of bright pixels. And the number of such pixels is kept in the ongoing database. When a user submits an image, it goes through all of the aforementioned procedures. The user-provided image's bright pixel count is calculated upon edge detection.

The pixel count that was collected is then contrasted with earlier pixel counts that were saved in the database. On the basis of comparison, we will determine if the fruit is contaminated or not; if it is, we will recommend a suitable solution to combat the infection. The causes and symptoms of the bacterial disease, the segmented and edge detected pictures of the infected image, and the treatments for the infection with the show usage of the required chemical fertilisers, respectively. The provision of preventive measures is made if the infection is in its early stages.

The segmented infected image is and after segmentation, the same image is sent to clever edge detection. On careful examination of the edge-detected image, we have come to the conclusion that there is an infection present. The causes and symptoms of the bacterial disease, the segmented and edge detected pictures of the infected image, and the treatments for the infection with the Upon reviewing the nearly 400 infected images, we draw conclusions based on the levels of infection. Here, the levels of infection are divided into different percentages 20%, 40%, and 75%, roughly.

We are offering a remedy based on the proportion of infection. Roughly 35 of the nearly 450 photos with bacterial blight infection that we analysed for levels of infection showed levels below 20%, indicating early stages of infection. The remaining 343 images show an infection level of more than 80%, indicating that the pomegranate fruit is affected by bacterial blight. Additionally, about 72 images showed an infection of about 40%, which is on the verge of becoming infected by bacterial blight. Here, we are presenting the infection rate that was observed.

III. BLOCK DIAGRAM**IV. FUTURE SCOPE**

The concept is now used on a smartphone app, and it necessitates that the farmer roam around the field while taking images. Unsupervised drones that use computer vision to explore the field may be used in the future. The drone would take a number of images, which could then be uploaded back to the server where the model is running to produce a categorization result.

The modification of GANS to have the discriminator serve as a multi-class classifier, so that it would have $N+1$ output labels rather than simply two, has also received significant investigation. The problem of plant disease detection might potentially be addressed using this strategy.

V. CONCLUSION

Only a few studies on the automatic classification of rice plant diseases have been conducted in India. This paper studied deep CNN transfer learning for the first time. Disease classification for rice plants. Additionally, the experiments were carried out by dividing the entire dataset into various ratios of training-testing sets. The suggested model has a classification accuracy of 91.37% for an 80%–20% training–testing partition for identifying rice illnesses. Due to the lack of photos with standard labels for rice illness, evaluating the suggested model against the literature is not appropriate. With a big collection of photos of rice that is ill, the performance of the suggested model can be significantly enhanced.

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