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Disease Recognition in Rice Crops using Image Processing

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Abstract: ***Most of the farmers are not in a position to apply optimum amount of inputs to their crops, which are crucial for growth within the production of crops. They may additionally also no longer recognise the right fertilizer required for the infected plants and as a consequence it is able to lead to unbalanced use of fertilizer. They may additionally also not know what amount and which pesticide/insecticide to be used for the diseased plants, subsequently the yield receives affected. This venture affords the information concerning the diseases in a rice crop and offers the name of the ailment and its affected vicinity. The farmer clicks the picture of the inflamed crop with the help of cellular telephones or virtual cameras and uploads it. The picture is then processed with the usage of the Image Processing strategies and the disorder can be detected. The information of the diseases such as name of the disease and the area affected in the conjunction with the quantity of pesticide/insecticide for use are sent to the farmer and the farmer can see the information of crop in his application. This may additionally result in the blessings in monitoring big amount of plants in a field, and thus robotically detects the symptoms of illnesses as soon as they seem on plant leaves.***

Keywords: Rice Crop Disease, Image Acquisition, Image Pre-Processing, Image Segmentation, Feature Extraction, Disease Classification.

I. INTRODUCTION

An Image is a dimensional signal. Image processing is a way to perform some of the operations on a picture, so that it will get an enhanced image or to extract some of the useful information from it. The arrival of latest technology together with such as Digital photo processing and Image analysis technology has many applications inside the biological field. As about 78% of the farmers are marginal farmers in across the country and are also bad in resources. Therefore, they are not in a feature to use optimum quantity of inputs to their crops which are essential for increase within the manufacturing of crops. Most of farmers may not knowledge the proper quantity of fertilizer required for production of plant life and thus it is able to the reason of an unbalanced use of fertilizer and they may additionally no longer realise what amount and which pesticide/insecticide to be used for the diseased plants. Hence the yield will be affected.

A user friendly utility set up on Android phone may cause some extent help to the farmers, to clear up the problems of detecting diseases in plants. The farmer clicks the photo of the infected crop with the help of mobile phones or digital cameras and uploads it. The photograph is then processed using the Image Processing techniques and the disorder can be detected. The details of the diseases such as name of the disease and the area affected along with the amount of pesticide/insecticide for use are sent to the farmer and the farmer can see the details of crop in his utility.

II. PROPOSED SYSTEM

In the proposed system, at the first farmer should upload the photograph of the infected crop. The photographs are acquired from the farmer through the Android Application which is evolved to offer services to the farmers. The picture uploaded by the farmer with the aid of choosing the suitable photo of the inflamed leaf using the Choose File option.

The uploaded picture by means of the farmer is then processed by means of the MATLAB. Then image-processing strategies are performed to the uploaded photograph to extract some features that are useful for further evaluation of inflamed crop. After that, several analytical strategies are used for classifying the ailment in the picture in accordance to the specific problem at hand. The name of the disorder which is affected to the crop is detected and displayed by way of the MATLAB. Affected area is also displayed at the side of the disorder name, to identify the severity of the disorder. The pesticides for the detected sickness and what amount to be used are entered into the database. The farmer can see all these information in his application.

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III. METHODOLOGY

Mobile telephones or virtual cameras are used to seize the images of inflamed part of the leaf. Image processing strategies are implemented on these inflamed images to get useful functions for reading the disease.

A. Image Acquisition

First step is photo acquisition, in which snap shots of the inflamed leaves are captured using cellular phone or digital camera. These snap shots of the infected leaves are stored in the database by specifying the path.

B. Image Pre-processing

Pre-processing of the image is used to improve the best of the picture through removing unwanted part of the image along with background. In this step clipping of the pictures based totally at the region of interest (ROI), picture smoothening and contrast enhancement are done.

C. Image Segmentation

The approach of dividing a picture into unique sub pictures is known as Image segmentation. In our project for clustering and dividing the image we use K means segmentation approach which makes use of the hue estimation method. Since the green coloration of the leaves is normal, so we are not thinking about them. We pick the cluster picture which indicates the infected area of the leaf for characteristic extraction. In K means clustering algorithm, the information vectors are grouped into clusters primarily based at the familiarity of the pixels via the Euclidian distance measurement. Centroids of the clusters are randomly initialized and their dimensions are same as the information vectors.

D. Classification

Leaves that are affected by illnesses are caused by fungi, bacteria and viruses. A leaf spot illness is occurred when insects harm the leaf. The infected part of the leaf will vary with the scale and color, relying at the level and organism involved. Spots can be found with diverse colorations inclusive of yellow, brown and black. The illnesses are classified primarily based at the texture facts from Gray-Level Co-Occurrence Matrix (GLCM).

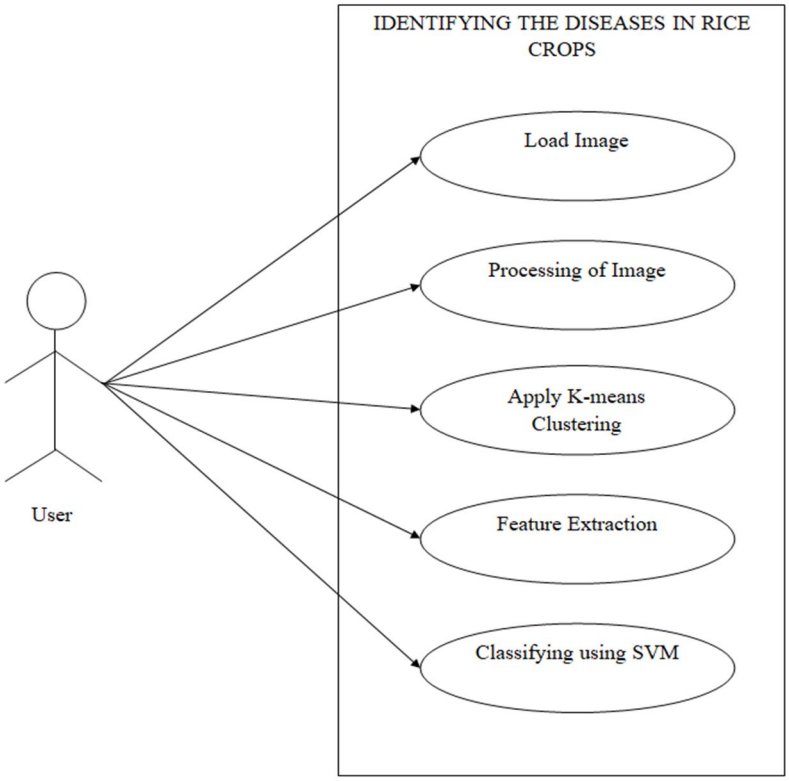

Figure 1: Use Case Diagram

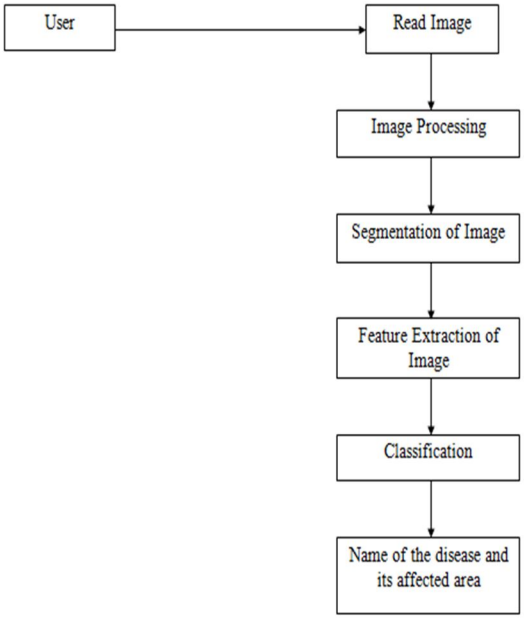

Figure 2: System Architecture

IV. RESULT ANALYSIS

In the first stage, as an input, photograph of different inflamed rice leaf is selected from the dataset. It must enhance the evaluation of the photo beneath natural light condition which will produce the comparison image and its going to convert the evaluation image into gray scale photo. Next, coloration transformation is drawn by way of RGB to HSV (Hue, Saturation and value) photo format, which is used for analyzing the photograph segmentation. These hues are extracted by using the color models HSV. Hue component is used for the further evaluation from the color place transformation. Then, by means of photo segmentation, disorder spotted part is extracted. For photo segmentation K means clustering algorithm is used. So, K means clustering approach is used for partitioning the collection of objects into k groups. The set of rules is started out with the aid of calculating the mean value through every cluster and computes the distance of each cluster to corresponding mean. Finally it assigns the factor to nearest cluster. As a result, the name of the disorder for given infected leaf and affected vicinity for the inflamed leaf could be displayed and what amount of pesticide/insecticide must be used can be known.

V. CONCLUSION

An application of detecting the plant illnesses and it offers the necessary recommendations for the disease which have been detected. The diseases that are certain to these plants were considered for testing of the set of rules. The result of the experiment indicates the proposed technique that can recognize the diseases with a bit computational effort. By this approach, the disease name and the affected vicinity for that plant can be identified.

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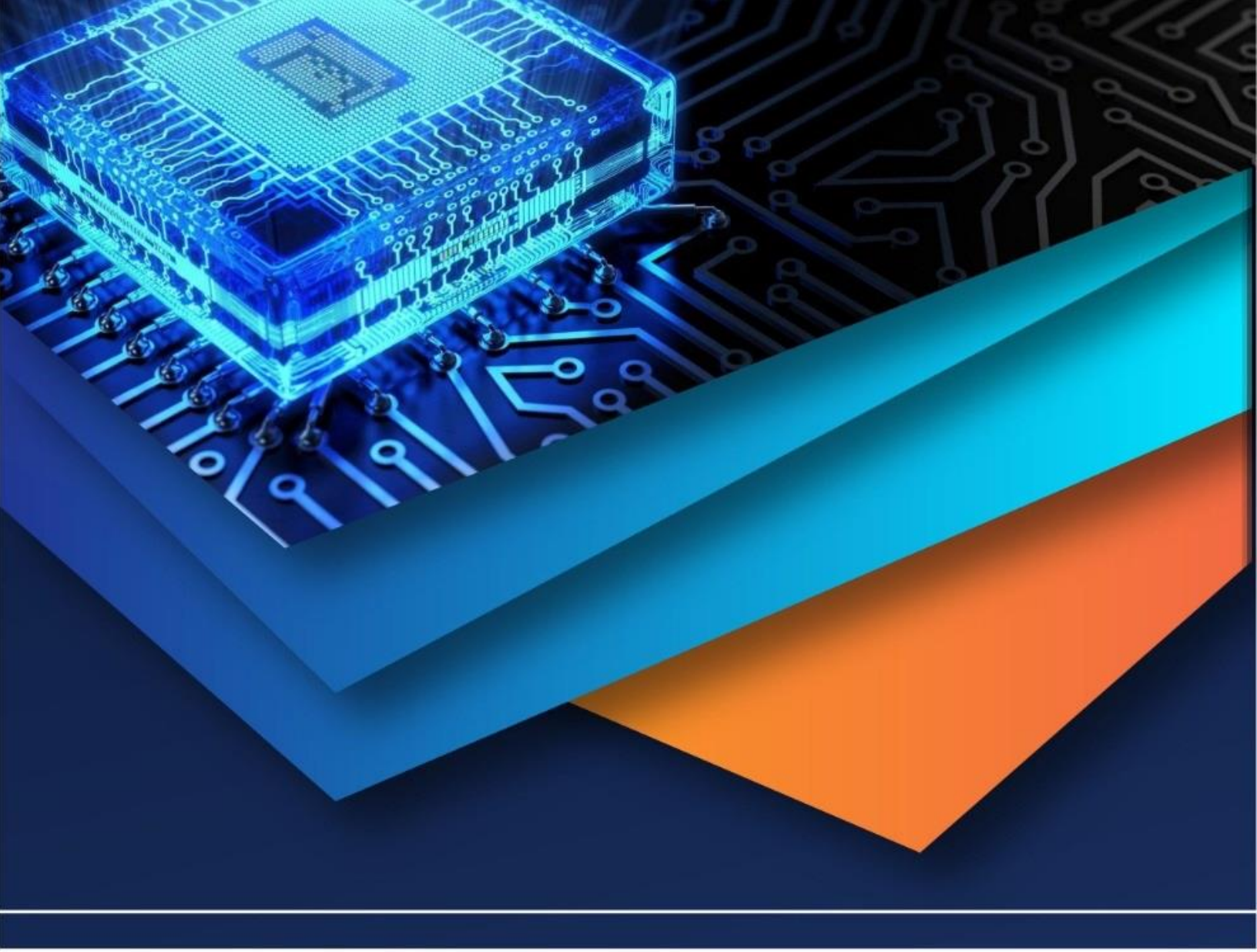

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