Plant Disease Detection using Machine Learning and Image Processing

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Abstract - Agriculture is one of the most important sector in India. Our Indian exchange mark is also enormously depend on the agriculture, since 65 percent of the human beings are going with agriculture, it is important to increase the crop/plant productiveness, because of the different types of diseases happening for the crops farmers did no longer getting higher productivity and appropriate price in the market. This paper represents the detection of various types of illness that are occurring on the crops and an algorithm which classifies the various types of diseases by using the image processing techniques. Image segmentation is one of the image techniques which detects the sickness automatically and classify the diseases in early stage. via detecting the different types of diseases in early stage farmers can increase their crop productivity, crop quality and top rates in the marketplace.

*Key Words***:** machine learning, android development, image detection, image pre- processing, image classification.

1. INTRODUCTION

Identification of the plant disease is the important thing to stopping the losses in the yield and quality of the agricultural product. The research of the plant sickness mean the research of visually observable patterns seen on111 the plant. Health tracking and sickness detection on plant may be very vital for sustainable agriculture. Its far very tough to screen the plant sickness manually. It requires notable quantity of labor, understanding in the plant illnesses and also require the excessive processing time. Therefore, picture processing and device gaining knowledge of techniques are used for the detection of plant sickness. Disease detection involves the stairs like images acquisition, image pre-processing, photo segmentation, characteristics extraction and classification.

The detection of plant disease through some automated technique is beneficial since it reduces the monitoring work in big farms, as well as detecting the symptoms of diseases at an early stage.

2. PROBLEM STATEMENT

Agriculture is the primary a part of economic sector of India. Most of populace of India is depend upon agriculture. The yield ability of plenty of vegetation get decreases because of the sickness take place on the leaf of that crop. So, leaf disorder detection is one of the vital methods for agricultural applications to increase the yield and expect them. So, we are the use of leaf disease detection using image processing and gadget getting to know.

3. EXISTING SYSTEM

The existing method for plant ailment detection is genuinely naked eye remark by the use of professionals via which identity and detection of plant ailment is finished. For doing so, a large crew of experts similarly to non prevent monitoring of plant is wanted, which prices very immoderate whilst we do with huge farms. At the same time, in few countries, farmers do now not have right middle or maybe concept that they are able to contact to professionals. Because of which consulting experts even price high as well as time ingesting too.

For classic device vision-primarily based totally plant ailment detection method, traditional photo processing algorithms or manual design of characteristic plus classifiers are often used.

Fig 1. disease detection

4. LITURATURE SURVEY

2.1 K. Elangoran, S. Nalini [2] offered a concept of plant disease class using image segmentation and SVM techniques. This paper describes an picture processing method that identifies the visual signs of plant diseases using an evaluation of colored images, paintings of software program that acknowledge the shade and form of the leaf image. LABVIEW software program was used to seize the picture of plant RGB coloration model and MATLAB software is used to enable a reputation technique to decide the plant disease through the leaf images. The color model respectively turned into used to reduce effect of illumination and distinguish between leaf colors effectively and the resulting color pixels are clustered to obtain companies of shade in the images.

2.2 Sagar Patil, Anjali chandavale [4] this survey mainly concentrates on ailment detection of divot plants, right here the image acquisition is completed by way of taking RGB

photograph sample as enter and remodel it into HSI form, after that for texture evaluation CCM and SGDM is used. In agricultural field, rice cultivation performs a crucial role. however their growths are suffering from diverse diseases. There may be lower inside the manufacturing if the diseases are not diagnosed at an early stage. The primary intention of this work is to expand an image processing system which could identify and classify the numerous rice plant diseases affecting the cultivation of rice particularly brown spot disease, leaf blast diseases and bacterial blight disorder. This paintings can be divided into 2 components particularly-rice plant disease detection and reputation of rice plant diseases. In disease detection, the disease affected portion of the rice plant is first diagnosed using KNN and clustering classifier. After that, in disease popularity the rice plant disease type is diagnosed using classifiers particularly KNN and SVM.

2.3 Yashpal Sen, Chandra Shekar Mithlesh, Dr. Vivek Baghel [1] describes an technique for disease detection of crop for financial growth of rural vicinity. This paper mentioned approximately an automated device for identifying and classifying exceptional different diseases of the contaminated plants is an emerging research vicinity in precision agriculture. This paper describes the approach to save you the crop from heavy loss via careful detection of diseases. The region of internet is leaf because most of the diseases occur in leaf best. Histogram equalization is used to pre-method the enter image to growth the assessment in low assessment image, K-mean clustering algorithm which classifies objects. Disease in crop leaf are detected accurately the usage of picture processing approach it is used to examine the disease so one can be beneficial to farmers.
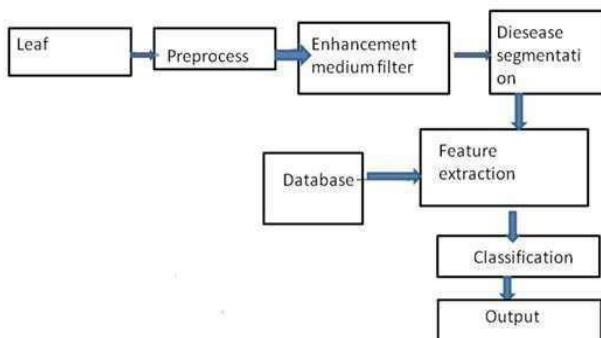
5. PROPOSED METHODOLOGY

Fig 2. System Architecture

This is the system architecture of our system which incorporates four modules that are explained as follows:

1. Leaf :

Here at this block, User will take picture together with his Smartphone or can add image from his storage media to the system.

2. Pre-processing :

Data pre-processing is crucial task in any computer imaginative and prescient-based system. Here operations like image resizing, enhancing contrast, doing away with noises from the image, changing RGB image into gray-scale image are executed.

3. Feature Extraction :

The functions in the image of chosen clusters are extracted. The photographs are commonly grey scaling wherein GLCM strategies are used, on this method the texture function are analyzed.

4. Classification :

The classification algorithm is a Supervised method that is used to pick out category of new observations on the idea of training data. In classification, a program learns from the given dataset or observations and then classifies some new observations or lessons onto a number of classes or groups.

In this system SVM classification technique is used. On this system SVM classification is used. The SVM make use of decision planes that defines boundaries. It is especially used for the classification and regressions strategies.

6. CONCLUSIONS

There are quantity of ways with the aid which we can hit upon sickness of plants and suggest treatments for them. Every has a few pros as well as boundaries .On one hand visual analysis is least costly and simple approach, it is not as efficient and dependable. Image processing is a technique that is maximum spoken for terribly excessive accuracy and least time intake are principal benefits offered. With very less computational efforts the most desirable results had been received, which additionally indicates the efficiency of proposed set of rules in recognition and class of the leaf diseases. Another advantage of using this approach is that the plant diseases can be recognized at early level or the initial stage.

7. ACKNOWLEDGEMENT

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