Plant Disease Detection Using Image Processing (Rural Development)

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ABSTRACT: To implement project which provide solution on plant disease to protect that particular plant by whole infection, at real time and how to improve health of infected plant. Making a system more effective and user friendly. India is an agricultural country, where about 70% of population depend on agriculture. The rainy season and summer are very difficult seasons to maintain agricultural area. Most of the farming is developed in rural region. So facility and equipment not reach their easily. This all phasesaffect on farming and many disease causes through nature. There are three types of infections viral, bacterial and fungal. Symptoms of this disease seen on leaf, fruits, flower, branches and root. In this project we are focusing on leafs here .symptoms are like wilts, spots, dwarfing, rots, holes etc. This type of numerous diseases which cause significant yield losses every year .early detection of disease and proper identification will help to take decision on proper usage of pesticides in term of their quality and type. To solve this problem we using here Image Processing concept on infected section of plant like leaf, root etc.

KEYWORDS: Image processing software, Digitization and Image Capture, Camera calibration, Sampling, Enhancement, Filtering, Grayscale manipulation, Sharpening and de-blurring, Smoothing.

I. INTRODUCTION

"Crop Disease Detection Using Image Processing (Rural Development Concept)" is software in which we are going to provide the features, by using that features the user can easily find the infection on the crops at initial state. Which help user to easily detect unwanted diseases and prevent the crop from loss.In this system we are taking the crop images as an input? Then we applying the image processing technique on this image and find out the knowledge from the image. As per the knowledge software will provide the result at the end with the solution. This system is used to quantify affected area by disease.This system provides method to detect the by calculating leaf area .this technique studied for increasing throughput and reducing subjectiveness arising from human expert in detecting the leaf disease.Processing system is developed to automate the inspection of leaf spot .here more than half percent of population depend on agriculture in India .However, the farming of these crops for best yield and quality produce is highly technical .It can be improved by help of technological support.The leaf area monitoring is an important tool in studying physiological features related to the plant growth, photosynthetic & transpiration process. Also being useful parameter in evaluate, harm caused by leaf diseases and pastes, to find out water and environmental stress, need of fertilization, for effective management and action. leaf determination is done by direct method, which involves measuring whole leaf area which all are based on relation of some plants characteristics with the true leaf area obtained in critical tests. We making this system because naked eye examination gives poor accuracy, Hence image processing method is used to obtain high exactitude & accuracy whether leaf with the maximum dimensions. It will consume less time compare to any physical interfere as well as it can be easy to process if images are stored. This algorithm will help to detect amount of disease present on the leaf, by means of presence of holes & changes in the colour. It will be easy to go for the severity measurement of disease. Image Processing system is developed to automate the inspection of leaf infection and disease .So the crop disease detection using image processing system is very useful to a level of improvement in agricultural area which can help to increase in marketing sector of agriculture area .it also will be beneficial for the economy of India because 70% of Indian population depend on agricultural sector. Disease detection Image processing is flexible; it will be accept all updates.

II. BACKGROUND

The leaf area monitoring is an important tool in studying physiological features related to the plant growth, photosynthetic & transpiration process. Also being helpful parameter in evaluating, damage caused by leaf diseases and pastes, to find out water and environmental stress, need of fertilization, for effective management and treatment. On this study to help farmers some measurement such as physical and chemical parameters are analysed and by using the image processing techniques to find required solution for crop grow well. Through this technique we can improve the agricultural production up to maximum level. There is more scope of this system in future. Image processing techniques in agriculture are broadly extending their applications for disease analysing for different crops in an accurate and time efficient way. This eventually will help in maintaining the crop health. . Disease management is a challenging task. Mostly diseases are seen on the leaves or stems of the plant. Precise quantification of these visually observed diseases, traits has not studied yet because of the complexity of visual patterns. This system provides method to detect the by calculating leaf area .this technique studied for increasing throughput and reducing subjectiveness arising from human expert in detecting the leaf disease.
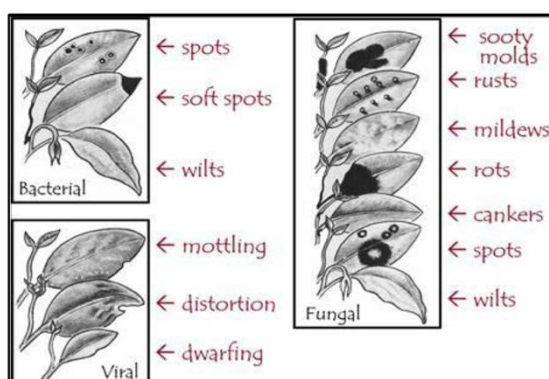

Fig. 1 Type of disease

A. *Image Detection and Processing:*

Actually the purpose of this application is that to provide farmer facility of crop disease detection and proper solution on particular disease. There are various disease spots arises which tends to look like each other and can be easily confused one to another by inexperience people. Thatone mistakemakes misunderstanding about spot which can be provide decision as wrong fungicides which results to loss of money without plants are treated accurately. The diseases spots are different in types from which we analysing the disease, they spots are like red rot, yellow spot, leaf spot, brown spot etc. So we have purpose to make this artificial technique for automatic detection and classification of leaf disease by using image processing technique. The image of infected leaves captured by digital camera processed that image in system by using colour transformation, filtering, and pixel counting to detect the infected part of leaves. The other applications of creating that artificial system are:

- Make system to detect the crop disease.
- System will be User friendly and easy to use.
- Analyze proper result and provide proper solution.
- Prevent the plant from disease.
- How to solve the disease related problem.
- Providing the useful information and updates related to the agriculture.

B. *Enhancement:*

- Noise Reduction: Unwanted part of image that effects the result of process so, it is necessary to reduce the unwanted part of image. The can be done by using camera in MACRO mode and using the OPENCV. Image Processing Tool that provides inbuilt noise reduction feature.

- Image Clipping: If the macro mode is used when taking the photo then there is no need to clipping but when image is taken directly without MACRO mode then image clipping played very important role.

C. *Spot Detection: Finding the spots*

Fig.2. Classification: Disease detection

After doing spot detection, detected spot match with the another image spot which is stored into the database. If detected spot match with the database, the respected result will displayed from database. Because of that system in short time we detect the which type of infection or weakness spread on the plants plant how to protect it from more harm, and how to maintain the further health of the plants and farm , and which type of pesticides and chemical are used to prevent farm. The one more advantage of this system is we can be updating it at any time when any changes required or want to invent and update the features. By that system we can easily and early get the solution on crop infection and disease which will help from loss of money, farm and economical increment. So, "CROP DISEASE DETECTION IMAGE PROCESSING PROJECT" helps to analysing best result and solutions depend on result. It also helps to make healthy and infection free farm.

That all purposes are help us to maintain the farm disease less andhealthy, which help us in increment of Business, in marketing purpose that help to development of country. This system will analyse the selected image by further processing it as converting in colour, counting pixels to defining result and result depending solution.

III. PROPOSED SYSTEM

To prevent plant from disease we have more solutions but problem is that which type of solution is working on particular plant. Soit is very important to give exact treatment to particular disease of particular plant. Because of this condition we create crop disease detection image processing system where we analyse multiple crop efficiently. Through this system we get more infected part of leaf and solutions which are depend result. this project we implement to get better solution for user to prevent plant from disease and infection. By this we will analyse many types of crop at one place easily .no need of different systems to different crop. This system is used to quantify affected area by disease. This system will be more efficient, effective and user friendly by using better GUI, additional features and advanced new. Effective solutions are depending on respective result. Image pre-processing techniques are basically used to bring out details that are simply to highlight certain features of interest in an image. System is used to find the boundaries of the affected area, determine colour of affected area and identify object correctly. This system is more powerful in future. While we should search solution manually it takes more time and not get easy and accurate solution. We have purpose of this project to provide solution on plant disease as easiest way, have accurate solution on disease

or problem and minimizing time to user. We have stock of infected leaf images and related solution. Creating system where we can analyse multiple crop efficiently. This system will be adoptable which adopt new thing as new invented things. This system will help farmers to easy and fast identification of disease and infections on crops. user no need to waste their more time to analyse disease and it's solution. Early identification and disease recognition will help to reduce loss. The farmer need to do proper and regular monitoring on wide area of farm for prevent plants from any illness and disease.

IV. MATHEMATICAL MODEL

Set Theory

1. S= { } be as system for taking image of crop

2. Identify Input as E= {E1, E2, E3…..En}

      Where, En= Farmers crop image

3. Analyse Output: i.e. Image feature extraction, Spot detection
      S= {En, T}

4. Identify Process P = Result Matching
      S= {En, P, T}
      P= {Pr, K, Gd, Nn, Fl}

      Where Pr = Pre-processing

      K =k-means   Gd= Gaussian distribution
      Nn = Image Processing   Fl = Fuzzy logic

5. Result finding= Result matching and solution
      S = {En, Pr, K, Gd,,Nn,Fl,, T}

• Input: Crop leaf/branch/Fruit image without any filter

• Output: Result of crop health

Discover data structures, classes, divide and conquer strategies to develop distributed/parallel/concurrent processing, constraints.

Functions: Identify Objects, Morphisms, Overloading in functions, Functional relations

• Success Conditions: Result.

• Failure Conditions: Failure reason.

V. CONCLUSION AND FUTURE WORK

The correct detection and classification of the disease is incredibly necessary for the productive cultivation of crop and this will be done mistreatment image process. This paper mentioned varied techniques to section the unwellness a part of the plant. This paper conjointly mentioned some Feature extraction and classification techniques to extract the options of infected leaf and therefore the classification of plant diseases. From these strategies, we can accurately determine and classify varied plant diseases mistreatment image process techniques

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