

Wheat Disease Detection Using Image Processing

<u>Trupti R. Tambake¹</u>, Dr. Pushpa B. Patil²

¹M.tech Student, Department of Computer Science and Engineering, B.L.D.E.A's Dr. P.G Halakatti College of Engineering and Technology, Vijayapur, Karnataka, India; trupti.tambake@gmail.com

² Head of Department, Department of Computer Science and Engineering, B.L.D.E.A's Dr. P.G Halakatti College of Engineering and Technology, Vijayapur, Karnataka, India; <u>pushpa_ms@rediffmail.com</u>

ABSTRACT

Now-a-days wheat plants are getting infected by different types of diseases very rapidly. It is must to come up with new system to single out diseases. It is must to design and implement such a system that can easily find out the diseases infected by plants. After identifying need to classify the type of disease stuck to that plant. The proposed system has been implemented involuntarily detect and can clasify the disease of leafs, stem as well as its grains.

Keywords: image acquisition, segmentation, classification, preprocessing

1. INTRODUCTION

The important reason for decrement in capacity and number of production of plants is due to its diseases. Agriculturing is the most of basic reason for survival in many states of india. Due to infection of plants there will be great fatality for growing plants and serving sufficient food to humans. The affected leaves dry up, the grain shrivel and the yield is very low. e.g.in Rabi 2010-11, this disease led to huge losses in these states, the outburst of yellow rust in Districts of Kathua, Samba and Jammu on variety PBW 343 in the season (2008- 09) was serious. It is must to design and implement such a system that can easily find out the diseases infected by plants. After identifying need to classify the type of disease stuck to that plant. The proposed system has been implemented involuntarily detect and can clasify the disease of leafs, stem as well as its grains. There are five major steps in this system, First is image acquisition in this images of wheat plants are collected for database. Images are captured by high resolution digital camera. Second is preprocessing which is done using subtaction method. Third is segmentation it is done using clustering methods like k means. fourth is feature extraction in which wheat image is extracted on basis of shape, color and texture and last fifth step is classification. Image processing technics are used for detection of wheat crops.

- 1. To identify plant diseases in remote area easily.
- 2. To increase the agricultural production by proper identification of diseases.



Fig 1 Healthy leaves



Fig 2 Unhealthy leaves

2. LITERATURE SURVEY

This section focuses on the survey conducted on the topic. The various contributions related to the topic are discussed in detail.

In [1], In this paper author has proposed approach involves four necessary stages, Image obtaining of plant leaf images, pre-processing of images, picture segmentation, feature extraction and classification of images in various disease classes. In this work essential part is the procurement of leaf images with the utilization of portable camera which have better more determination. The dataset comprises of sound leaves and contaminated leaves images. In next arrange the pre-processing procedures are apply on input clears out images for better outcomes in next processing.



In [2], The articles concern of passing on heterogeneous adaptable sensors over a goal go. That demonstrates how standard approaches planned for homogeneous frameworks crash and burn when gotten in the heterogeneous specialist setting. It will theoretically exhibit the respectability of approach to manage the organization of heterogeneous frameworks

In [3], In this paper author focus on identifying and finding disease types exactly from the images of leaves. Author has done survey on grape fruit and found two major diseases i.e. powdery mildew and downey mildew which damages plants. major and minor axis features of plants have be classifier for classification of disease. The proposed framework is equipped for distinguishing the ailment at the prior stage when it happens on the leaf.

In [4], In this paper author has collected 185 advanced images of plant diseases were acquired by utilizing regular computerized camera. The images were partitioned into two gatherings as indicated by the kinds of plants. PCA is used to convert group of perceptions into prescribed values. lessening the measurements of the feature information extricated from the images of plant diseases could lessen the running time of the neural networks and adequate acknowledgment comes about could be gotten. PCA could be utilized to lessen the measurements of the information differed from the disease images and after that ideal neural networks could be built for plant disease recognizable proof.

3. METHODOLOGY

This section explains details of proposed method. This project tells about various methods available in image processing for automatic detection of wheat crop disease . Following are the techniques used for implementing the proposed system. Basic steps in proposed system are:



I. IMAGE ACQUSITION

Different images of wheat leaf, stem and grains are captured from different angles. so that all the parts of plant can be detected. Images are captured using high resolution camera and almost 1000 images are stored in database including healthy and unhealthy leaves. Some of wheat leaf images are copied from internet for more comparison of plants.

II. PREPROCESSING

While capturing images some of or all images are infected by noise so to reduce unwanted noise we have used median filtering method. Removing of noise from images is done before the segmentation.

III. SEGMENTATION



It is essential advance in image preparing. It will causes to separate images with a specific end goal to remove the contaminated zone from wheat leaf, which will break down the infection. We require K-means clustering partition technique. The capacity K-means groups the information and returns index as indicated by the assistance to bunches. K-means clustering is appropriate for vast measure of information. It arranged group in such a route pixels in question is nearer to each other and pixels from various articles are a long way from each other.



Fig 10 Original Image



Fig 11 Image after K-cluster Mean

IV. FEATURE EXTRACTION

Feature extraction is next important step after segmentation. It collect features of segmented images. The images must be disparate and significant to classifier work. We have used technics to convert RGB into HSI images. properties of wheat leaf images can be extracted using texture, shape or color features.

V. CLASSIFICATION

In this step we will utilize two grouping procedures to get higher rate of revamping of harms and manifestations. One is Neural network works on texture, color and shape. Second one is support vector machine works on texture and shape highlights. Every classifier gives best outcomes for the chose highlights.

4. CONCLUSION

This paper introduces various different types of diseases of wheat plants. By using k means and clustering methods we can extract the infected areas of plants . Using classification methods those are neural networks and support vector machine we can classify the type of disease being stuck to the plants. From the observation Support Vector Machine provides more correct and efficient result then neural networks. Proposed system can identify diseases like stem rust, rot ,powdery mildew, karnal bunt mould, bacterial, etc. which helps to provide efficient pesticides to remove the diseases and make plants healthy at early stage.

REFERENCES



[1] Chaitali G. Dhaware, Mrs. K.H. Wanjale "A Modern Approach for Plant Leaf Disease Classification which Depends on Leaf Image Processing"International Conference on Computer Communication and Informatics IEEE,2017

[2] Nitin S. Tijare1, Prof. Sagar S. Badnerkar, "Image Recognition based crop Disease Identification System: A survey" International Journal of Computer Science and Mobile Computing April 2014

[3] Sushil R. Kamlapurkar "Detection of plant disease using Image Processing approach", International Journal of Scientific and Research Publications, Volume 6, Issue 2, February 2016

[4] Haiguang Wang, Guanlin Li, Zhanhong Ma, Xiaolong Li"Image Recognition of Plant Diseases Based on Principal Component Analysis and Neural Networks"International Conference on Natural Computation IEEE,2012

[5] Nitin S. Tijare1, Prof. Sagar S. Badnerkar, "Image Recognition based crop Disease Identification System: A survey" International Journal of Computer Science and Mobile Computing April 2014

[6] Shivani K. Tichkule, Prof. Dhanashri. H. Gawali"Plant Diseases Detection Using Image Processing

Techniques" Online International Conference on Green Engineering and Technologies IEEE, 2016

[7] Swapnil S. Ayane, M. A. Khan, S. M. "Detection of Nitrogen Deficiency In Cotton Plant By Using Image Processing " International Journal of Pure and Applied Research in Engineering and Technology, 2013; Volume 1(8): 112-118

[8] Prof. Sanjay B. Dhaygude, Mr.Nitin P.Kumbhar "Agricultural plant Leaf Disease Detection Using Image Processing", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering Vol. 2, Issue 1, January 2013

[9] Ismail El Massi, Youssef Es-saady, Mostaf, Driss, Abdeslam "Automatic recognition of the damages and symptoms on plant leaves using parallel combination of two classifier",IEEE Conference 2016

[10] Al Bashish, M. Braikl,S. Bani-Ahmad " Detection and classification of leaf disease using K-means clustering based segmentation and Neural Network based classification", Information Technology journal 2011.

