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PLANT DISEASE DETECTION: FEATURE INTEGRATION OF VISUAL REGION AND LOSS REWEIGHTINGAPPROACH

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ABSTRACT: Nowadays the advances in image processing give a new way. One of the newest way to solve this issue via visual plant disease analysis. In this paper, we discuss the problem of plant disease recognition. Here we tackle plant disease recognition via reweighting both visual regions and loss to emphasize diseased parts. In this paper, we discuss the problem of plant disease recognition. Here we tackle plant disease recognition via reweighting both visual regions and loss to emphasize diseased parts. We first compute the weights of all the divided patches from each image based on the cluster distribution of these patches to indicate the discriminative level of each patch. Then we allocate the weight to each loss for each patch-label pair during weakly supervised training to enable discriminative disease part learning.

INTRODUCTION

Plant disease affects the agriculture production seasonally on variety of ways. Identifying and early detection of disease is an important factor for production management to improve the economic growth. Most commonly the disease symptoms are identified by observing the disease in the plant leaf region. Existing machine learning models use images with improper and high dimensional features that lead to inaccurate classification of plant leaf disease. One of the most important factors of such quality is plant diseases. onsequently, minimizing plant diseases allows substantially improving quality of the products. Rice known as Oryza Sativa (specific name), is one of the most utilized

food plants and widely grown originated in ASIA. [4] Rice is an important crop worldwide and over half of the world population relies on it for food. Many people in the world including Malaysia eat rice as staple food. However,there are many factors that make paddy rice production become slow and less productive. One of the main factors is paddy disease. An abnormal condition that injures the plant or leads it to function improperly is called as a disease. Diseases are readily recognized by their symptoms. There are a lot of paddy disease types which are Bakanae, red disease virus, brown spot disease and many more.[1] Image processing and computer vision technology are very beneficial to the agricultural industry. They are more potential and more important to many areas in agricultural technology [1].

Paddy Disease Detection System is one ofthe very beneficial systems. It can help thepaddy farmer detect the disease faster. This study aims to develop a prototypesystem to automatically detect and classify the paddy diseases by using image processing technique as an alternative or supplemental to the traditional manual method. India is fast developing country and agriculture is the back bone for the countries development in the early stages. Due to industrialization and globalization concepts the field is facing hurdles. On topof that the awareness and the necessity of the cultivation need to be instilled in the minds of the younger generation. Now a day's technology plays vital role in all the fields but till today we are using some old methodologies in agriculture. Identifying plant disease wrongly leads to huge loss ofyield, time, money and quality of product.Identifying the condition of plant plays an important role for successful cultivation. In olden days identification is done manually by the experienced people but due to the somany environmental changes the prediction is becoming tough. So we can use image processing techniques for identification of plant disease. Generally we can observe the symptoms of disease on leafs, stems, flowers etc. So here we use leafs for identification of disease affected plants. The feature extraction is done in RGB, HSV, YIQ and Dithered Images. The feature extraction from RGB image is added in the suggested system. A new automatic method for disease symptom segmentation in digital photographs of plant leaves. The diseases of different plant species has mentioned. Classification is done for few of the disease names in this system. The disease recognition for the leaf image is performed in this work. India is eminent for Agriculture that means most of the people are engaged towards agriculture industry.

The agriculture industry act as a significant

role in the economic sectors. Most of the plants are infected by variant fungal and bacterial diseases.

PROPOSEDSYSTEM

The whole process of the proposed method, which starts from image acquisition that is collecting the images from the data base.

These images get segmented by using K-means clustering algorithm and features are extracted from the clusters and which are given to the ANN classifier as input. Image Acquisition is the process of collecting the images from database. The images are loaded from plant village data base. Loaded images are tomato healthy, tomato leaf spot and cotton leaf healthy and leaf spot. Image segmentation is the process of dividing the images in to different parts i.e. clusters and which is done by using k-means clustering algorithm. K-means clustering algorithm is used to separate the stained part and healthy leaf region. In this, first step is- Load the image into MATLAB from the database, then convert the RGB image into L*a*b* color space. L* represents the lightness, a* and b* represents the chromaticity layers. All of the color information is in the a* and b* layers. And next step is clustering the variant colors. The Image gets partitioned into three regions by reallocating each pixel to its nearest clusters which reduces the sum of distances and recalculate the centroids of the clusters. Each cluster consists of different segments of leaf image. Three clusters have index values which are used to label the every pixel in the image using results from K means.

Convolutional neural networks. Sounds like a weird combination of biology and math with a little CS sprinkled in, but these networks have been some of the most influential innovations in the field of computer vision. 2012 was the first year that neural nets grew to prominence as Alex Krizhevsky used them to win that year's ImageNet competition (basically, the annual Olympics of computer vision), dropping the classification error record from 26% to 15%, an astounding improvement at the time. Ever since then, a host of companies have been using deep learning at the core of their services.Facebook uses neural nets for their automatic tagging algorithms, Google for their photo search, Amazon for their product recommendations, Pinterest for their home feed personalization, and Instagram for their search infrastructure.

LITERATURE SURVEY

This chapter briefly reviews, explains and discusses on existing literature review related with the current project which is

"Paddy Disease Detection System Using Image Processing" that will be developed later. This chapter comprises three sections. The first section describes the overviews of paddy. The subsections are the definition, type of paddy disease, paddy symptom and paddy management. The second section is the review of some existing system that used same techniques and methods. The third section discusses the review on technique and method used by the system. The subsections are image acquisition, image segmentation and artificial neural network.

There are many factors that make paddy rice production become slow and less productive. One of the main factors is paddy disease. The table below will show you type of paddy disease, the symptom of paddy disease and the management of paddy disease. This researches focus on three types of diseases, which are paddy

blast, brown. Gavhale, and U. Gawande, Gavhale and Gawande (2014) presented reviews and summarizes image processing techniques for several plant species that have been used for recognizing plant diseases. The major techniques for detection of plant diseases are: back propagation neural network (BPNN), Support Vector Machine (SVM),K-nearest neighbor (KNN), and Spatial Gray-level Dependence Matrices (SGDM). These techniques are used to analyses the healthy and diseased plants leaves. Intelligent Diagnose System of Wheat Diseases Based on Android Phone by Y.

Q. Xia, Y. Li, and C. Li, In 2015, Xia andLi have proposed the android design of intelligent wheat diseases diagnose system. In this process, users collect images of wheat diseases using Android phones and send the images across the network to the server for disease diagnosis. After receiving disease images, the server performs image segmentation by converting the images from RGB color space to HSI color space.

The color and texture features of the diseases are to be determined by using colour moment matrix and the gray level co-occurrence matrix. The preferred features are input to the support vector machine for recognition and the identification results are fed back to the client. Implementation of RGB and Gray scale images in plant leaves disease detection –comparative study by Padmavathi and Thangadurai (2016) have given the comparative results of RGB and Gray scale images in leaf disease finding process. In detecting the infected leaves, color becomes an important feature to find the disease intensity. They have considered

Grayscale and RGB images and used median filter for image enhancement and segmentation for extraction of the diseased portion which are used to identify the disease level. The plant disease recognition model, based on leaf image classification, by the use of deep convolution networks have developed. 13 kinds of diseases are identified from the healthy leaves with the capability to differentiate leaves from their surroundings.

RELATED WORK

The plant pathogens especially microbes will be the main subject of this chapter. The science, which is concerned with the study of plant diseases and their causes, is known as plant pathology. Therefore, all scientists concerned with this science constantly attempt to treat the diseased plants via various methods. This approach of scientific research is very important owing to the economic and hygienic yield for humans and animals. The phytopathogens are two types: biotic factors, which include all microbes and parasitic plants, and abiotic factors, which include all environmental factors.

Essentially, the plant pathology is correlated with other sciences such as entomology, bacteriology, mycology, virology, and weed science due to deleterious effects of insects, bacteria, fungi, viruses/viroids, and weeds on plants, respectively.

This approach is more favorable because itis friendlier with the environment and healthier for humans and animals [2]. The infected part of the plant gives an indication of the type of plant disease, such as infected root which is usually correlated with root-rot disease [3]. The plant diseases can be classified according to several parameters: disease symptoms, infected organ, infected plant type, and the type of phytopathogen. The latter is considered the more useful criterion used for plant disease classification, because it easily determines the disease cause, potential disease complications, and possible control methods [4]. According to this criterion, plant diseases are classified into two types: infectious (biotic) diseases, which are caused by eukaryotes, prokaryotes, parasitic higher plants, viruses/viroids, nematodes, and protozoa, and noninfectious (abiotic) diseases, whichare caused by different extreme environmental condition

Infectious diseases

There are wide range of phytopathogens which cause infectious plant diseases such as fungi, bacteria, viruses, viroids, mollicutes, parasitic higher plants, and

protozoa. The infectious disease means the ability of phytopathogen to transfer from the infected plant to another healthy one and causes the same disease and the same symptoms. The most phytopathogens can inhabit the internal environment of plants; however, some others can live on the plant surface such as some fungi, bacteria, and parasitic higher plants

Diseases caused by parasitic higherplants

Some plant diseases are developed due to growing certain plants attached on or in other plants, where they take all required nutrients without benefit sharing; these plants are called parasitic higher plants. This abnormal relationship leads to weakness of healthy or host plant. The parasitic higher plants are usually found attached with the surface of the host plant, such as dodder, mistletoe, witchweed, andbroomrape

Diseases caused by nematodes

The nematodes are one of most common phytopathogens which have definite symptoms. These symptoms only appeared in the infected site. The nematode infections in or on plants are widely distributed especially in proper environments such as moderate temperature and high humidit

Diseases caused by fungi

Interestingly, there are two main types of fungi appearing on plants: pathogenic and saprophytic. The pathogenic fungi live in or on plant tissues and cause serious complications for the vital physiological functions of plants, while saprophytic ones live in or on dead tissues. Accordingly, the diagnosis of plant disease must be exactly carried out. The exact diagnosis and determination of fungi take place by microscopical examination to identify the mycelial morphological characteristics, whatever fruiting structures and spores.

After complete identification for the fungus and the symptoms of plant disease, the latter should be compared with that reported in the reference.

SAMPLE RESULTS

CONCLUSION

This project implements an innovative idea to identify the affected crops and provide remedy measures to the agricultural industry. By the use of k- mean clustering algorithm, the infected region of the leaf is segmented and analyzed. The images are fed to our application for the identification of diseases. It provides a good choice for agriculture community particularly in remote villages. It acts as an efficient system in terms of reducing clustering time and the area of infected region.

Feature extraction technique helps to extract the infected leaf and also to classify the plant diseases. CNN and IOT insertion yields excellent efficient to this concept for improvement in accuracy.

The proposed approach is a valuable approach, which can significantly support an accurate detection of leaf diseases in alittle computational effort.

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