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Leaf Disease Detection and Classification

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ABSTRACT: In Biological Science, images form an important data and information. Plant diseases have lead to a difficult problem, which directly affects the quality and quantity of the crop production. Automated detection of plant diseases is an necessary research topic as it may prove beneficial in surveillance of large fields of crops, and therefore automatically detect the indication of diseases as soon as they appear on plant leaf. The intended system is a software solution for automated detection and computation of texture for plant leaf diseases. The advanced processing scheme consists of four main steps, first a colour modified structure for the input RGB image is designed, then the green pixels are marked and removed using particular threshold value, then the image is split up and the useful segments are extracted, finally the texture statistics is evaluated. From the texture statistics, the presence of diseases on the plant leaf is checked. Investigation outputs on a database of about 500 plant leaves of 30 different plants confirm the strength of the proposed approach. In addition to the disease detection system we have introduced weather fore-casting and online sales of the crop sampling.

KEYWORDS: Weather fore-casting, online sale ,Color Co-occurrence Matrix, Texture, HSI ,Plant Leaf Diseases.

I. INTRODUCTION

The intention of Agriculture is not only to provide ever growing population with food but it's an essential source of energy and a answer to solve the problem of global warming. Plant diseases are extremely notable, as that can adversely impact both quality and quantity of crops in agriculture production. Plant disease diagnosis is very necessary in earlier stage in order to heal and regulate them. Generally the naked eye method is used to identify the diseases. In this method specialist are involved who have the capability to identify the changes in leaf colour. This procedure involves lots of endeavour, takes long time and also not experimental for the large fields. Many times different specialist detect the same disease as the divergent disease. This method is expensive as it requires continuous monitoring of experts. Based on the applications, many systems have been suggested to solve or at least to decrease the problems, by making use of image processing, pattern recognition and some automated classification tools. In the next section this paper tries to represent those proposed systems in meaningful way.

II. LITERATURE REVIEW

According to Ajay A. Gurjar and Viraj A. Gulhane describes detection of three diseases by an Eigen feature regularization and extraction technique. This system is having sufficient accuracy, than that of the other feature



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detection techniques. With this technique about 90% of detection of Red spot i.e. Presence of fungal disease is identified. [1].

According to Dheeb Al Bashish& et al. suggested image processing based work is comprises of the following main steps : In the first step the obtained images are divided using the K-means techniques and then secondly the divided images are passed through a Neural network .The images of leaf taken from Al-Ghor area in Jordan. Five diseases that are frequent in leaves were adopted for this research; they are: Early scorch, Cottony mold, Ashenmold, late scorch, tiny whiteness. The practical outcome describes that the neural network classifier that is based on statistical International Journal of Recent Advances in Engineering & Technology (IJRAET) classification support accurate and automatic detection of leaf diseases with a precision of around 93% [2].

In [3], diagnosis system for grape leaf diseases is proposed. The suggested system is composed of three main parts: Firstly grape leave color extraction from complex background, secondly grape leaf disease color extraction and finally grape leaf disease classification. In this investigation back-propagation NN with a self-organizing characteristic map together is used to recognize colors of grape leaf. Further MSOFM and GA distributed for grape leave disease segmentation and SVM for classification. Lastly filtration of segmented image is done by Gabor Wavelet and then Support Vector Machine is again applied for classification of grape leaf diseases. This system can categorize the grape leaf diseases into three classes as Scab disease, rust disease and no disease. Even though there are some restriction of extracting ambiguous color pixels from the background of the image. The system denotes very encouraging performance for any agricultural product analysis.

S. Arivazhagan et al.[4] has developed four principle steps are first a color transformationstructure for the input RGB image is generated, and then the green pixels are marked and eliminated using specific threshold value followed by segmentation process, evaluating the texture features using color co-occurrence technique for the useful segments, finally the extracted features are proceed through the classifier. SVM are a set of related supervised learning method used for the process of classification and regression. The detection accuracy is enhanced by SVM classifier. The two class problem is then expanded to multi class problem where the detected leave diseases are then organized into various groups. By this technique, the plant diseases can be detected at initial stage itself and the pest control techniques can be used to resolve pest problems while minimizing risks to people and the environment.

III. EXISTING SYSTEM

Plant leaf identification using neural network classifiers is an automatic system for identifying plant species on the basis on leaf images. Plant leaf images relevant to three plant types, are examined using two divergent shape modelling techniques, the first on the basis of the Moments-Invariant model and the second on the Centroid-Radii model .Here they have used a technique for the extraction of shape, color and texture features from leave images and training an neural network classifier to identify the specific leaf class option of proper image input features to attain high efficiency with less calculational complexity. NN's are used as classifiers for segregation. This work has been established using the image processing and neural network toolboxes Useful for fast and well organized classification of plant species. Used by the forest department for classification of the plant species.



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IV. PROPOSED SYSTEM



Fig 1: Block Diagram of Proposed System.

The bit-by-bit strategy of the recommended system:

- 1. RGB image collection
- 2. Transform the input image from RGB to HSI format.
- 3. Marking the green-pixels
- 4. Elimination of masked green pixels
- 5.Segment the module
- 6. Get the helpful segments
- 7. Assess the characteristic using colour-co -occurrence methodology
- 8. Analysis of texture statistics.



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V. EXPERIMENTAL RESULT



Fig 2: Expected results

Fig 2 shows that On the bases of proposed algorithm not only the disease associated with the plant leave can be detected but the affected area and the degree of sickness could be calculated at a higher efficiency rate. Based on these the remedy for the crop is suggested.

VI. CONCLUSION

An application of texture evaluation in identifying the plant diseases has been elaborated in this paper. To identify the disease is main purpose of the proposed approach. The experimental outcome show the proposed approach can identify the leaf diseases with little calculational effort. The expansion of this work will concentrate on developing algorithms and NN's in order to increase the identification rate of classification process.

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