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Real Time Object Detection of Melon Leaf Disease

Shivani Kamble[1], *Nishant Ovhal*[2], *Ganesh Patil*[3], *Suhas Chavan*[4]
[1,2,3,4] *Assistant Professor Computer Engineering, Nutan Maharashtra Institute of Engineering and Technology / SavitribaiPhule Pune University, India*

****Corresponding Author***
E-Mail Id:-*shivanijayantkamble@gmail.com*

ABSTRACT

This study suggests a deep convolutional network model for quick and accurate automatic identification using several films of melon leaf disease. The signs of plant melon infections can differ. Expert plant pathologists may be better at recognising diseases than inexperienced farmers. Farmers could benefit greatly from an autonomous system designed to recognise agricultural illnesses by the appearance of the crop and visual symptoms as a verification mechanism in disease detection. The development of quick and accurate techniques for identifying leaf diseases has taken a lot of effort. With the aid of neural networks and digital image processing techniques, plant leaf disease can be detected. Deep learning has advanced greatly during the past few years. Now, it can retrieve pertinent feature representations within deep learning. It can now extract pertinent feature representations from a big dataset of input photos. With the ability to swiftly and precisely identify agricultural ailments made possible by deep learning, plant protection accuracy will increase, and computer vision applications in precision agriculture will become more widespread.

Keywords:-*Convolutional Neural Network, Deep learning, melon leaf Disease detection, image processing*

INTRODUCTION

In India, there were around 1.38 billion inhabitants as of April 2020. Estimates place the number of farmers in India at 95.8 million. It should be remembered that the agriculture sector accounts for 18% of India's GDP early. Therefore, it would be safe to infer that modernizing agriculture would have a significant positive impact on the country and, in addition to improving conditions for local farmers, would also create a number of opportunities for employment and economic growth in the agricultural sectors. in India

made significant progress in the study and creation of herbicides, fungicides, and insecticides. However, tonnes of produced crops are squandered each year as a result of natural factors, including the spread of various known illnesses among crops. Early and timely diagnosis of plant diseases can help remedy this issue. It will assist farmers across the country in overcoming their challenging financial circumstances.

Viruses that cause melon leaf disease pose a threat to sustainable agriculture and generate significant financial losses. International trade, climate change, and viruses' capacity for fast evolution are the primary causes of the frequent appearance of novel viral illnesses. The technique of identifying each leaf separately in agricultural applications is the most difficult.

LITERATURE SURVEY

Paper Name: Tomato Leaf Disease Detection Using Deep Learning

Techniques Author: Surampalli Ashok , Gemini Kishore , Velpula Rajesh , S. Suchitra4 , S.G.Gino
Sophia , B.Pavithra

From India Early plant leaf detection is essential in a developing agricultural economy like India. In order to make plants safe and prevent losses to the agricultural economy, it is essential that leaf diseases in plants are identified at an early stage and predictive mechanisms are implemented.

This is true not only for the agricultural economy but also for the large population that needs to be fed. Using image processing methods based on picture segmentation, clustering, and open-source algorithms, this study proposes to identify the Tomato Plant Leaf disease, therefore all contributing to a trustworthy, secure, accurate system of leaf disease with thespecialization to Tomato Plants.[1]
Paper Name: LEAF DISEASE DETECTION AND FERTILIZER SUGGESTION
Author: Indumathi.R, Saagari.N, Thejuswini.V, Swarnareka.R

Agriculture is under serious threat, and this threat includes illnesses that affect plant leaves. Our technique identifies both the illness that infected the leaf and the damaged area of the leaf. Image processing is used to accomplish this; systems exist that can forecast illnesses in leaves. Our approach employs K-Medoid clustering and the Random Forest algorithm to increase the accuracy of illness identification in leaves. The afflicted area of the leaf is first located using pre-processing, and then the clustering method is used. Then, 13 charactersóincluding

Mean, SD, Entropy, RMS, Variance, Smoothness, Kurtosis, Skewness, IDM, Contrast, Correlation, Energy, and Homogeneityó are derived from it, This allows usto assess the precision

Paper Name :Hierarchical Learning of Tree Classifiers for Large-Scale Plant Species Identification
Author: Jianping Fan, Ning Zhou, Jinye Peng,Ling Gao

In this paper, a hierarchical multi-task structural learning algorithm is developed to support large-scale plant species identification. To do this, a visual tree is constructed for categorising a large number of plant species in a coarse-to-fine manner and automatically identifying the inter-related learning tasksFor a given parent node on the visual tree, it contains a set of sibling coarse-grained plant species categories or sibling fine-grained plant species for a given parent node on the visual tree, and a multi-task structural learning algorithm is developed to train their inter-related classifiers jointly for improving their discrimination power.

A relationship constraint is formally defined and used to learn more discriminating tree classifiers over the visual tree, For example, the requirement that a plant image must first be correctly assigned to a parent node (high-level non-leaf node) before it can be assigned to the most relevant child node is an example of a relationship constraint, which is formally defined and used to learn more discriminating tree classifiers over the visual tree (low-level non-leaf node or leaf node.The experimental results have demonstrated the effectiveness of our hierarchical multi-task structure learning strategy in training more discriminative tree classifiers for thorough plant species identification

Paper Name: An Individual Grape Leaf Disease Identification Using Leaf Skele-

tonsand KNN Classification
Author: N.KRITHIKA,DR.A.GRACE SELVARANI

The technique of identifying each leaf separatelyin agricultural applications is the most difficult. This research proposes a categorization of grape leaf diseases and identifies the leaf types. The leaf skeletons are initially recognised using grape pictures. Since estimates of the positions and dimensions of the leaves are made using leaf skeletons.

Paper Name: Classification of Cotton Leaf Spot diseases using image processing edge detection technique
Author's Name: N. Kaithika, DR.A.Grace Selavarani

This Proposed Work reveals cutting-edge computing technology that has been created to assist farmers in making better decisions on many different areas of crop development. For enhanced output, a proper examination and diagnosis of crop disease in the field is essential. Foliar is the most common and serious fungus disease of cotton, and it affects all cotton-growing regions in India. Using photos of cotton leaf spot symptoms collected on mobile devices and novel technical methodologies, we identify the diseases in this work using the proposed algorithm of HPCCDD.

The classifier is being taught to enable intelligent farming, which includes early disease detectionin the groves and targeted fungicide application, among other things. The recorded images are first processed for enhancement In this proposed study, which is based on Image RGB feature range algorithms used to identify the disorders, the captured images are initially processed for enhancement (using Ranging values) Then target zones are obtained by colour picture segmentation (disease spots). The edges are then identified using homogenise techniques like the Sobel and Canny filter; the retrieved edge features are then employed in classification to find the illness areas. The farmers are then provided pest recommendations to protect their cropand lower yield loss.

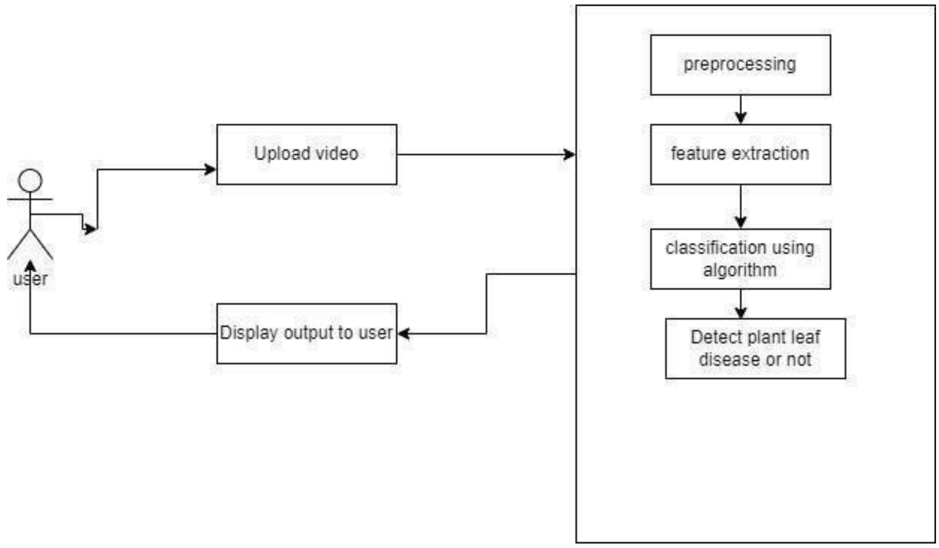
EXISTING WORK

The model is created using photographs in the current system. For the retrieval of skeletons, the Tangential Direction (TD) based segmentation approach is suggested. The histograms of the H and a colour channels are formed after the melon leaf images are identified, and the pixel values are then examined to discriminate between healthy anddiseased tissues. Then, in order to identify the leaf illnesses, extract the features and classify using the KNN classification algorithm.

PROPOSED SYSTEM

For the purpose of detecting melon leaf disease in the suggested system, we employ the CNN algorithm since, given a solid dataset, it offers the highest degree of accuracy. In the suggested system, we record the video, process it, and determine whether or not the leaf is infected. Here, a dataset is used, and after preprocessing, training is performed on the data. The pictures of the

Diseased plants are in a separate folder since we can train and predict the model easily if the data is of this type. The trained data is divided into two groups: one for validation and another for verification that is into training and testing data that to be in the 80:20 ratio. A model is created once the data is trained, and the developed model is then used along with the CNN algorithm to predictdisease. With the help of CNN, we can reach the highest accuracy.



REQUIREMENT ANALYSIS

Requirement analysis is the stage of the SDLC that is most important and fundamental. The senior team members carry it out with input from all the stakeholders, domain experts, and SMEs in the industry. Planning is also done at this time to identify project-related hazards and to meet the requirements for quality assurance. The business analyst and project manager arrange a meeting with the client to gather all the relevant details, such as what the customer wants to build, who will be the end user, and what the product's purpose is. Before creating the product, it is essential to have a basic grasp of it.

SYSTEM DESIGN

The subsequent phase will expose all of the information on the requirements, analysis, and design of the software project. The outcomes of the preceding two phases, include

Requirement collection and client input.

IMPLEMENTATION

Here, the SDLC's actual development phase begins, and programming is produced. The process of implementing a design begins with coding. The coding standards provided by their supervisors must be followed by developers.

FUTURE WORK

Testing: After the code has been created, it is examined to verify if it complies with the specifications. This makes sure that the items' solutions deal with the demands discovered and gathered throughout the requirements stage. At this level, testing is done using unit testing, integration testing, system testing, and acceptability testing.

When the programme is certified and there have been no reported errors or malfunctions, deployment takes place. Depending on the evaluation, the software may subsequently be given either as is or with suggested changes to the object section. After the software is deployed, maintenance work begins. Maintenance - Once the client begins utilising the built systems, the real problems appear and necessitate periodic resolution. This process, when the developed is cared for maintenance.

CONCLUSION

This paper provides a very accurate deep learning solution for melon leaf disease detection using convolutional neural network for classification. The model that was given was trained using a dataset with a large number of images. As we increase the number of input images after training the model, it will be able to recognise melon leaf disease from new input images, enhancing model performance accuracy.

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