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Crop Disease Identification Using Deep Learning

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A B S T R A C T

The deep convolutional network model used in this project uses a variety of crop disease photos to provide quick and accurate automated detection. Symptoms of crop diseases might vary. Inexperienced farmers may have a harder time spotting infection than trained crop pathologists. An autonomous system that is created to recognize agricultural illnesses by the appearance of the crop and visual symptoms could be a huge assistance to farmers as a verification system in disease identification . A lot of work has gone into developing quick and precise methods for identifying leaf diseases. We can identify crop disease using neural networks and digital image processing approaches. The last few years have seen enormous progress in deep learning. Currently, it can extract practical feature representations. The proposed solution is composed of four main phases: a color conversion structure, image segmentation technique, calculation of the texture features and, finally, a pretrained neural network for transmitting take out the features.

Keywords:Disease Detection, Convolutional Neural Network, Deep Learning.

1. Introduction

Agriculture field is the backbone of any country. Agriculture supplies the food and raw accoutrements to the people in country. It's the only income source of numerous peoples. Peoples who belong with husbandry field faces numerous problems similar as dwindling product due to infelicitous climatic changes, flood tide, dearth and numerous other natural reasons and infrequently factors. They're unfit to do husbandry due to this reason. growers are facing lots of problems and loss due to lack of knowledge. utmost of the growers are moreover committing self-murder or migrating from the husbandry. Motive behind this design is to give a system to the growers that will give them the suitable information to descry the crop complaint. At the same time, we also bandied some of the current challenges and problems that need to be resolved. The precise discovery of the complaint is an important step in reducing its spread to bordering shops, operation of applicable complaint control treatments, and perfecting crop productivity. There's also a need to descry and cover the quality and volume of Crops, growers need to the descry conditions on present Crops. growers who grow crop are facing lot of profitable losses every time because of colorful conditions that can be to a crop. If a planter can descry these conditions beforehand and apply applicable treatment also it can save lot of waste and help the profitable loss. The treatment for Crop are little different so it's important that you can directly identify What kind of complaint is there in that factory. The Proposed System handed a presto, automatic and accurate image grounded result for the identification of splint conditions.

2. Literature Survey

Expert System for Diagnosis Mango Diseases Using Leaf Symptoms Analysis.

This research presents the development of an expert system for diagnosis Crop diseases in Barracuda mango (Nam-Dok Mai) which is one of a major export agricultural yield of Thailand. However, Thailand is in a tropical country and the climate causes the variation of Crop diseases that affect to the growth of mango trees. Many type of agriculture yield are decreased due to an agriculturist are lacking of knowledge on how to classify type of Crop disease correctly. Moreover, there is no suggestion system for a decision-making in choosing a suitable way to prevent or treat the disease that occur in their farm. This causes a lot of error in their infected Crop treatments. Therefore, this system has been developed for help an agriculturist to diagnose the infected Crop and to solve the problem immediately. The agriculturist should have the application which work in process of specific Crop disease diagnosis as an expert human work.

Detection of unhealthy region of plant leaves using Image Processing and Genetic Algorithm.

The focus is on perfecting productivity without taking into consideration the environmental goods that have appeared in the degeneration of the terrain. Plant conditions are veritably important as this can especially indicate both the quality and volume of factory in the development of agriculture. However, volume or productivity is affected, If proper care isn't taken in this area also it causes serious goods on shops and due to which separate product quality.

Discovery of factory complaint through some automatic fashion is salutary as it reduces a large work of monitoring in big granges of crops, and at veritably early stage itself it detects the symptoms of conditions means when they appear on factory leaves. This paper presents an algorithm for image segmentation fashion used for automatic discovery as well as bracket of factory splint conditions and check on different conditions bracket ways that can be used for factory splint complaint discovery. Image segmentation, which is an important aspect for complaint discovery in factory splint complaint, is done by using inheritable algorithm.

Computer Vision image Enhancement For Crop Leaves Disease Detection.

Enhanced images have high quality and clarity than original captured images. Computer vision image enhancement (Color conversion and Histogram equalization) is used in different real time applications such as remote sensing, medical image analysis and Crop leaves disease detection. Original captured images are RGB images. RGB images are combination of primary colors (Red, Green and Blue). It is difficult to implement the applications because of the range of this color is 0 to 255. Grayscale images have only the range between 0 and 1. So it is easy to implement many applications. Histogram equalization is used to increase the images clarity. Grayscale conversion and histogram equalization is used in Crop disease detection.

Disease Detection of Crop Leaf using Image Processing and CNN with Preventive Measures.

Agriculture is a very significant field for increasing population over the world to meet the basic needs of food. Meanwhile, nutrition and the world economy depend on the growth of grains and vegetables. Many farmers are cultivating in remote areas of the world with the lack of accurate knowledge and disease detection, however, they rely on manual observation on grains and vegetables, as a result, they are suffering from a great loss. Digital farming practices can be an interesting solution for easily and quickly detecting Crop diseases. To address such issues, this paper proposes Crop disease detection and preventive measures technique in the agricultural field using image processing and two well-known convolutional neural network (CNN) models as AlexNet and ResNet-50. Firstly, this technique is applied on Kaggle datasets of potato and tomato leaves to investigate the symptoms of unhealthy leaf. Then, the feature extraction and classification process are performed in dataset images to detect leaf diseases using AlexNet.

Crop Leaf Detection and Disease Recognition using Deep Learning.

The latest improvements in computer vision formulated through deep learning have paved the method for how to detect and diagnose diseases in Crop by using a camera to capture images as basis for recognizing several types of Crop diseases. This study provides an efficient solution for detecting multiple diseases in several Crop varieties. The system was designed to detect and recognize several Crop varieties specifically apple, corn, grapes, potato, sugarcane, and tomato. The system can also detect several diseases of Crop. The trained model has achieved an accuracy rate of and the system was able to register up to accuracy in detecting and recognizing the Crop variety and the type of diseases the Crop was infected.

3. Proposed System

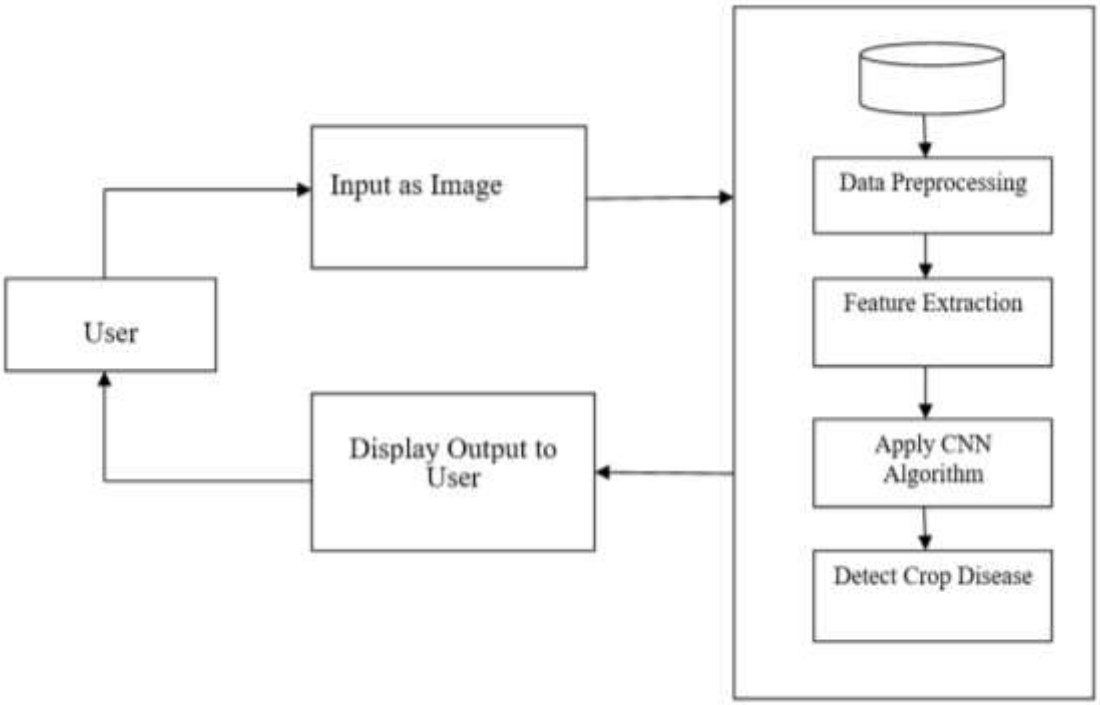

Fig. System Architecture

For Crop Disease Detection System, When stoner is opened the operation for the first time, the stoner will see the frontal runner, which shows the small details about the design and also contains the contact section. In the frontal runner, we give " login " and " Register "button.However, He She must first register on portal, If the stoner isn't formerly registered with the system. After clicking on " Register " a enrollment form will get opened that contains some details like First name, Last name, Dispatch, word, Mobile Number, Gender Etc. After submitting this form, Message are will be transferred to the stoner by the system to their Portal. The stoner can login by simply clicking on " login ". After entering the correct details, the stoner will be directly diverted to the main runner. After logging into the operation He She entered into operation main stoner Interface. We've handed the Forgot word button for Forgot word if anyone lost the word. The word will be in Standard Format. After successful login, the stoner will be diverted to the main runner, which contains the dashboard, including home, upload images, and history. After clicking on the upload image option, the stoner will see options like " prisoner " or " upload. " After submitting the image, a result will be generated and shown on the same runner, which includes stage of the complaint, impact of complaint on the factory and what watch the planter needs to take. Our system helps growers more understand the quantum of fungicide they need to use for factory health. It also informs the planter whether or not the complaint can be treated with organic fertilizer.

4. Conclusion

In conclusion, the crop disease detection system using Convolutional Neural Networks (CNN) has proven to be an effective and promising approach in the field of agriculture. By leveraging the power of deep learning and computer vision techniques, the system aims to detect and diagnose diseases in crops accurately and efficiently.

The CNN-based crop disease detection system has several advantages. Firstly, it can analyze large datasets of images and learn intricate patterns and features that human observers might miss. This enables the system to identify diseases with high precision and recall rates. Secondly, the system can process images in real-time, allowing for timely detection and intervention, which is crucial for preventing the spread of diseases and minimizing crop losses. Moreover, the system can be trained on diverse datasets, covering a wide range of crops and diseases, making it adaptable and scalable for different agricultural scenarios.

The implementation of the crop disease detection system typically involves several steps. Initially, a labeled dataset of images is collected, consisting of healthy crop images and images of crops affected by various diseases. Next, the CNN model is trained using the labeled dataset, where it learns to extract relevant features and classify the images into healthy or diseased categories. During the training process, techniques like data augmentation and transfer learning can be employed to enhance the model's performance. Once the model is trained, it can be deployed in a realworld scenario, where it can analyze new images and provide disease predictions.

In summary, the crop disease detection system using CNN holds great potential for revolutionizing the agricultural sector. By leveraging advanced deep learning techniques, it can provide accurate and timely disease diagnoses, assisting farmers in managing crop health more effectively. Further research and development in this field are necessary to address the challenges and improve the system's capabilities, ultimately contributing to sustainable and efficient agricultural practices.

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