Smart Farming using Deep Learning

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Abstract: *The latest improvement in computer vision formulated through deep learning have paved the method for how to detect and diagnose diseases in plant by using a camera to capture image as basis for recognizing several types of plant diseases. This study provides an efficient solution for detecting multiple diseases in several plant varieties. The System was designed to detect and recognize several plant varieties specially leaf"s, Fruits, Flowers etc. In this paper an system has been developed to see whether or not the plant is healthy or unhealthy. The conventional growth of the plants, yield and quality of agriculture merchandise is seriously tormented by disease. This paper tries to develop an system that detect the presence of illness within the plant. An system detect the illness of the plant and give the solution like pesticides and treatments etc.*

Keywords: Plant disease recognition, deeplearning, computer vision, convolutional neural network

I. INTRODUCTION

Early plant disease detection plays a significant role in efficient crop yield. Plant diseases like black measles, black rot, bacterial spot, etc. affect the growth, crop quality of plants and economic impacts in the agriculture industry. To avoid the impact of these disease, expensive approaches and the use of pesticides are some solutions the farmers usually implement.

The use of chemical damages the plant and the surrounding environment. In addition, this kind of approach intensifies the cost of production and major monetary loss to farmers. Early discovery of diseases as they occur is the most important period for efficient disease management. Manual disease detection through human experts to identify and recognize plant diseases is a usual practice in agriculture. With the improvement in technology, automatic detection of plant diseases from raw images is possible through computer vision and artificial intelligence researches. In this study, the researchers were able to investigate plant disease and pest infestation that affects the leaves of the plants.

Image processing techniques are now commonly employed in agriculture and it is applied for the detection and recognition of weeds, fruits grading, identifying and calculating disease infestations of plants and plant genomics. Currently, the introduction of deep learning methods turns out to be popular. Deep learning is the advanced methods of machine learning that uses neural networks that works like the human brain traditional method involves the use of semantic features as the classification method.

A convolutional neural network (CNN) is a deep learning model that is widely used in image processing. The work of lee et al. presents a hybrid model to obtain

II. LITERATURE SURVEY

[1]. Ivy Chung, Anoushka Gupta-In this paper the plants dieses are considered one of the two main causes of decreasing food availability. This paper explores not only the methods and findings of building a CNN based dieses detection model, but that of building a deployable remote crop diesesdetection.

[2]. Sapna Katiyar and Artika Farhana- This paper presents the survey of researches work of automation in agriculture with the support of sensors, agriculture robot and drones and AI driven technology to improve productivity.

[3]. XueweiSun[a]GuohouLi[a]PeixinQu[a]Xiwan gXie[b]XipengPan[c]WeidongZhang-In this paper we propose convolutional neural network architecture FL-Effacement which is used for multi category identification of plant dieses image.

[4]. Zhu N Y, Liu X, Liu Z Q, Hu K, Wang Y K, Tan J L, et al.- In this paper wepropose the which are different applicationis used in plant dieses detection and which are the tools is used like software, hardwarepart etc.

[5]. Mr. Thangavel. M -AP/ECE , Gayathri P K , Sabari K R, Prathiksha V- In this paper the researcher was founded how to detected diagnose in plants by using a camera to capture image as basis for recognizing several type of plant dieses.

[6]. Senthil Kumar Swami Durai a,Mary Divya Shamili- In this paper we studied about cultivating the soil, producing crops and keeping livestock in referred to as farmers.

[7]. Ashwin KS , Sebastian Cyriac- In this paper an automatic system has been developed to see whether the plant is healthy or unhealthy, if the is unhealthy then which pesticides we have to give the suggest.

[8]. Rahul Kundu, Usha Chauhan, S.P.S.Chauhan,- In this paper we studied about how to capture image of plant and how to detect the dieses using image processing.

[9]. Dhruvi Gosai; Binal Kaka; Dweepna Garg; Radhika Patel; Amit Ganatra- The main objective of this research is to construct one model ,which classify the healthy and diseased harvest leaves and predicts disease of plant.in this paper the ResNet is used to get well result of plant diseases from the various harvest.

III. METHODOLOGY
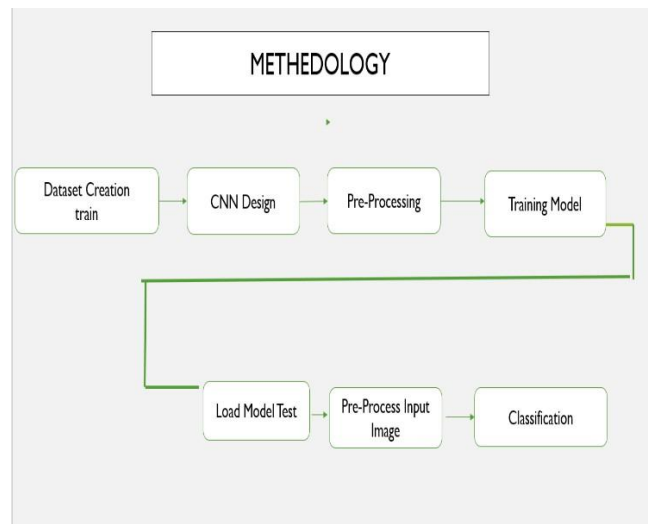
Dataset Creation Train

Deep learning neural networks learn a mapping function from inputs to output. This is achieved by updating the wrights ofthe network in response to the errors the model makes on the training dataset.Updates are made to continually reduce thiserror until either a good enough model is found or the learning process gets stuck andstops

CNN Design

CNN is a deep learning neural network sketched for processing structured arrays ofdata such as portrayals. CNN are very satisfactory at picking up on design in the input image, such as lines, gradients,circles, or even eyes and faces.

Data Preprocessing

Data preprocessing involves transforming raw data to well-formed data sets so that data mining analytics can be applied. Raw data is often incomplete and has inconsistent formatting. The adequacy or inadequacy of data preparation has a direct correlation with the success of any project that involves data analytics.

Training Model

A training model is a dataset that is to train an algorithm. It consist of the sample output data the corresponding sets of input data that have an influence on the output. The training model is used to run the input data through the algorithm to correlate the processed output against the sample output.

Load Model Test

This is the method that you should use for deep learning tests. Load the model in this method to avoid reloading the model before every test method is executed. This will save the model reload time.

Preprocess Input Image

Preprocess image for deep learning to train a network and make predictions on new data, your Images must match the input size of the network. If you need to adjust the size of your images to match the network, then you can rescale or crop your data to the required size.

Classification

Deep learning is a type of machine learning, a subset of artificial intelligence that allows machine to learn from data. Deep learning involves the use of computer system known as neural network. In neural networks, the input filters through hidden layers of nodes.

IV. EXISITING SYSYTEM

In existing system, only plants leaf disease detection are considered. The machine learning based existing methodology made out of the accompanying some state-of-the-art colour and texture features are extracted from the test image, then colour and texture features are fused together and machine learning is used for diseases classification.
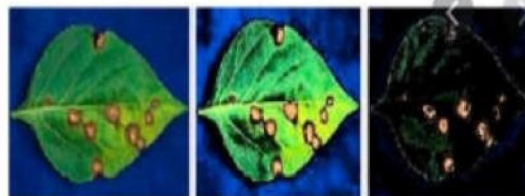
V. PROPOSED SYSTEM

This study is focused on the identification of plant, fruit and flowers diseases detection and treatment and fertilizers. The segmentation, feature extraction, and classification techniques are used to detect plant diseases. Photos of leaves from various plants are taken with a digital camera or similar unit, and the images are used to classify the affected region in the leaves. To detect plant disease, we use a Convolution neural network in the proposed framework. This paper proposes a framework that employs low-cost, open- source software to achieve the task of reliably detecting plant disease.
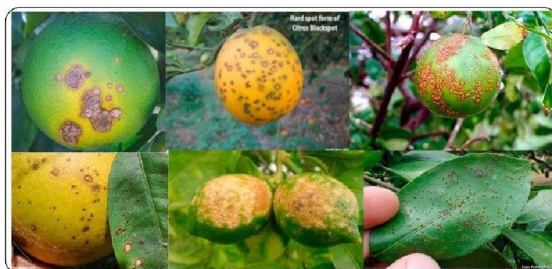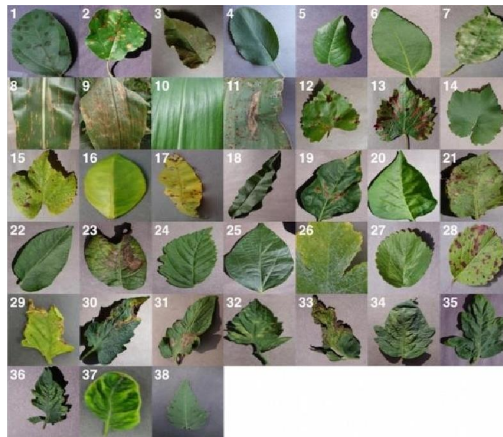
VI. EXPECTED RESULT

In this project we use plant, flowers and fruits to detect the disease. In this project we create one web application which isused to capture the image and predict the disease and give the its treatment, pesticidesetc. We first store the all type of leaf, flowers, fruit disease. When we click the photos it capture the image and compare with disease which is we stored in the database.

VII. CONCLUSION

The proposed system tracks the crop field on a regular basis. The CNN algorithms is used to identify plants ,fruits and flowers diseases at an early stage. Deep learning methods are used to detect the model, which aids in making appropriate disease decisions. To contain infected diseases, the farmer is advised to use pesticides and fertilizers as a cure. In the future, the proposed scheme could be expanded to provide additional facilities such as nearbygovernment markets, pesticide price lists, and a nearby open market, among others. This paper presents a review of various disease classification strategies for plant,fruits, flowers disease detection

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