

ABSTRACT

Agricultural productivity is something on which economy highly depends. This is the major reasons that disease detection in plants plays an important role in agriculture field, as having disease in plants are quite natural. If proper care is not taken in this area then it causes serious effects on plants and due to which respective product quality, quantity or productivity is affected. The Existing methods failed to detect plant diseases accurately and efficiently. The proposed method will provide a robust system based on deep learning techniques such as Convolutional neural networks (CNN), ResNet - 152 are used to visualise various plant diseases. The Proposed system will detect plant diseases accurately and efficiently which will meet all the bench marks.

Keywords: Plant disease, Deep learning, Convolutional neural networks (CNN), ResNet - 152.

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ABBREIVATIONS

CNN	Convolutional Neural Networks
ResNet-152	Residual Network
VGG	Visual Geometry Group
PReLU	Parametric ReLU
ReLU	Rectified Linear Activation

1.INTRODUCTION

The primary occupation in India is agriculture. India ranks second in the agricultural output worldwide. Here in India, farmers cultivate a great diversity of crops. Various factors such as climatic conditions, soil conditions, various disease, etc affect the production of the crops. The existing method for plants disease detection is simply naked eye observation which requires more man labor, properly equipped laboratories, expensive devices ,etc. And improper disease detection may led to inexperienced pesticide usage that can cause development of long term resistance of the pathogens, reducing the ability of the crop to fight back. The plant disease detection can be done by observing the spot on the leaves of the affected plant. The method we are adopting to detect plant diseases is image processing using Convolution neural network(CNN).[11] As the time changes we are facing challenges in agricultural fields.Agricultural productivity is something on which economy highly depends. Plant disease detection in early stages is tremendously important so that required precautions are taken by farmers to avoid huge loss. Machine learning has emerged with big data technologies and high-performance computing to create new opportunities for data intensive science in the multi-disciplinary agri-technologies domain. Deep learning with convolutional neural networks (CNNs) has achieved great success in the classification of various plant diseases.Plant disease diagnosis through optical observation of the symptoms on plant leaves, incorporates a significantly high degree of complexity.Here we are using convolutional neural networks in pytorch to detect if a leaf has a disease and to identify what type of disease it have when given a plant leaf image. In addition, some research gaps are identified from which to obtain greater transparency for detecting diseases in plants, even before their symptoms appear clearly. Major role in economic development of India Agriculture is the largest economic sector. The manual classification and identification methods which are being used to distinguish between different types of leaf diseases that are trusting on human resource. They are subjected to some kind of errors since these techniques are focused by human involvement. Since humans are subjected to tiredness and the automated system also helps to reduce the time consumed by manual techniques. The deficiency of labors, automatic system needs to be incorporated to minimize the work and Many new farming computerization tools are being established by university investigators that pose questions about the Effectiveness with which we succeed current farming practices.Identification of the plant diseases is the key to preventing the losses in the yield and quantity of the agricultural product. The studies of the plant diseases mean the studies of visually observable patterns seen on the plant. Health monitoring and disease detection on plant is very critical for sustainable agriculture. It is

very difficult to monitor the plant diseases manually. It requires tremendous amount of work, expertise in the plant diseases, and also require the excessive processing time. Hence, image processing is used for the detection of plant diseases. It has the following features: Disease detection involves the steps like image pre-processing, image segmentation, feature extraction and classification.[10]

1.2.Statement of Problem:

Plant diseases have turned into a dilemma as it can cause significant reduction in both quality and quantity of agricultural products. Early Detection of plant diseases is an essential research topic as it may prove benefits in monitoring large fields of crops. The proposed system is a software solution for Detection and classification of plant leaf diseases. The scheme consists of four main steps,

- Loading Data -> Data Loaders and Data Sizes
- Organising Data SetBuild and Train Network
- Creating Classifier
- Load Checkpoint and rebuild Model

1.3.Motivation:

- Leaves are delicate part of plant, The evaluation of agricultural harvest Classification is dynamic.
- The most important visual property is leafs texture and colour.
- Hence, classification of leaf disease is necessary in evaluating agricultural produce, increasing market value and meeting quality standards. Identifying and taking further dealings for further diffusion of the diseases it is also helpful.

The process will be too slow, If the identification and categorisation is done through physical

- techniques, we need the experts help sometimes it will be error prone and who are less available.