International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 06 Issue: 07 | July - 2022 Impact Factor: 7.185 ISSN: 2582-3930

PLANT DISEASES PREDICTION USING DEEP LEARNING

N. Shenbagavalli and Mrs.P.Krishnaveni
Final year PG Student, Assistant Professor,
Department Of Information Technology,
G. Venkataswamy Naidu College, Kovilpatti, Tamil Nadu, India
Email id: shenbagavalli2904@gmail.com

ABSTRACT:

The major agricultural products in India are rice, wheat, pulses, and spices. As our population is increasing rapidly the demand for agriculture products also increasing alarmingly. A huge amount of data is incremented from various field of agriculture. Analysis of this data helps in predicting the crop yield, analyzing soil quality, predicting disease in a plant, and how meteorological factor affects crop productivity. Crop protection plays a vital role in maintaining agriculture product. Pathogen, pest, weed, and animals are responsible for the productivity loss in agriculture product. Machine learning techniques like Random Forest, Bayesian Network, Decision Tree, Support Vector Machine etc. help in automatic detection of plant disease from visual symptoms in the plant. A survey of different existing machine learning techniques used for plant disease prediction was presented in this paper. Automatic detection of disease in plant helps in early diagnosis and prevention of disease which leads to an increase in agriculture productivity.

Keywords: Plant diseases prediction, Crop Productivity, Support vector machine, Deep learning, Visual symptoms.

……..*****…….

I.INTRODUCTION

The **Plant Disease Prediction using Deep Learning** technology can accurately detect presence of pests and disease in the farms. Upon this Machine learning algorithm CART can even predict accurately the chance of any disease and pest attacks in future. A normal human monitoring cannot accurately predict the amount and intense of pests and disease attacked in farm for spraying correct and enough fertilizers/pesticides to eliminate the host. Therefore, and artificial Percepton tells the accurate value and give corrective measure of amount of pesticides/fertilizers to be sprayed at specifiedtarget areas. The aim of the project is to help the farmers to protect his farm from any kind of pests and disease attacks and eliminate them without disturbing the decorum of the soil and untouched parts of other plants.

Plant disease forecasting is a management system used to predict the occurrence or change in severity of plant diseases. At the field scale, these systems are used by growers to make economic decisions about disease treatments for control. Often the systems ask the grower a series of questions about the susceptibility of the host crop, and incorporate current and forecast weather conditions to make a recommendation. Typically a recommendation is made about whether disease treatment is necessary or not. Usually treatment is a pesticide application.

Image segmentation is the process of separating or grouping an image into different parts. There are currently many different ways of performing image segmentation, ranging from the simple thresholding method to advanced color image segmentation methods. These parts normally correspond to something that humans can easily separate and view as individual objects. Computers have no means of intelligently recognizing objects, and so many different methods have been developed in order to segment images. The segmentation process is based on various features found in the image. This might be color information, boundaries or segment of an image. We use Genetic algorithm for color image segmentation.

II.RELATED WORK

As a part of literature survey, we investigated some applications of women safety that already exist in market. The aim is to observe how these applications work and to see how they can be improved and how are they different. To date it is identified that the following Android Apps of women security are good andare offering relatively similar service.

A.VIRAL

It is a living organism which has living cells in it and it affects the plant. The region affected by the virus in plant leaf and fruits are seen as yellow streaking, yellow spots, deformed leaves, and stunted
growth Tennant et al. [2018]. In cucumber viral infection is mainly caused by cucumber mosaic virus and these viral diseases is a communicable disease which can be spread from one plant to another plant either by insect or touch. The best way to prevent viral disease is the disposal of the viral affected region

B.FUNGI

Fungi is also one main reason for the productivity loss in the plant. Ascomycetes and basidiomycetes are two main fungi mainly responsible for disease in the plant. Fungicides are widely used for controlling
fungal infection in a plant Collinge et al. Magnaporthe grisea which is commonly known as rice blast disease. Sclerotinia sclerotiorum is responsible for cotton rot. Oomycetes and

Phytomyxea are the fungal-like organisms which contain destructive pathogen in the plant.

C. BACTERIA

When a plant is infected by microscopic living organisms then it is a bacterial infection. Bacteria is a one-celled organism. The bacterially infected regions in plants can be seen as wilts, spots, and scabs. The spots which are caused by the blights can spread rapidly in plants. Tropical plants and vegetables are

affected mainly by wilts. The absorption water by the plant is blocked by the bacterial infection. Some of the bacterial plant pathogens are Burkholderia and Proteobacteria.

Several Machine Learning (ML) models are used for the detection and classification of plant diseases but, after the advancements in a subset of ML, that is, Deep Learning (DL), this area of research appears to have great potential in terms of increased accuracy. Many developed/modified DL architectures are implemented along with several visualization techniques to detect and classify the symptoms of plant diseases. Moreover, several performance metrics are used for the evaluation of these architectures/techniques. This review provides a comprehensive explanation of DL models used to visualize various plant diseases. In addition, some research gaps are identified from which to obtain greater transparency for detecting diseases in plants, even before their symptoms appear clearly.

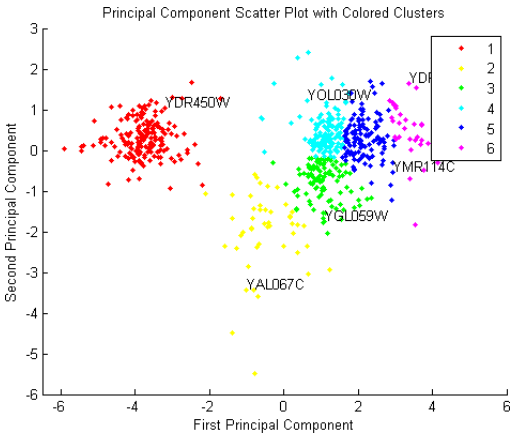
Agricultural productivity depends heavily on the economy. This is one of the reasons why plant disease detection plays a major role in agriculture. As plant disease is sort of natural and if proper care is not taken in this area, it has serious effects on plants and affects the quality, quantity or productivity of the respective products. Detection of plant disease using some automatic technique is beneficial because it reduces a large monitoring work in large crop farms and detects the symptoms of diseases at a very early stage, i.e. when they appear on plant leaves. This paper covers survey on different methodologies to detect plant leaf and fruit diseases using neural network.

III. PROPOSED WORK

The proposed system is analyzing an image and extracts its features. Convolution neural networks are deep learning algorithms that can process large datasets containing millions of parameters, modelled on 2D images, and connect the resulting representations to the corresponding outputs. A CNN is a supervised multilayer network that can dynamically learn new features from datasets. In nearly all significant classification challenges, CNNs have achieved state-of-the-art results recently. In the same architecture, they are also able to systematically isolate features and categorize them.

ADVANTAGES:

- It is easy to implement and gives quick result.
- It works on real world images
- Prediction accuracy is high and having robust working when training example have error in them
- Genetic algorithm optimizes both variables efficiently, continuous or discrete.
- It searches from a large sampling of the cost surface.
- Large number of variables can be processed at the same time.
- It can optimize variables with highly complex cost surfaces.
- Gives a number of optimum solutions, not a single solution. So different image segmentation results can be obtained at the same time
- Use of estimators for automatic Initialization of cluster centers so there is no need of user input at the time of segmentation.
- The detection accuracy is enhanced with proposed algorithm.
- Proposed method is fully automatic while existing methods require user input to select the best segmentation of input image.
- It also provides environment friendly recovery measures of the identified disease.



IV.CONCLUSION

Hence, we have completed Image classification, Image Categories, Feature Extraction, and Training Data. The whole development of algorithm is done in MATLAB tool. We have used several toolboxes like Statistics and Machine Learning toolbox, Neural Network Toolbox and Image Processing Toolbox.

The outputs as of now are the trainingdata in form of image categories, image classification using K-Means clustering and moisturecontent along with predicting of withstanding. The algorithm is done with training data and classification of given image dataset. The test input image is compared with the trained data for detection and prediction analysis. We are using Unsupervised Learning for precise accuracy.

Artificial neural networks (ANN) and Convolutional neural network (CNN) are the

most commonly used neural network models. Automatic detection of plant diseases would solve the matter of pricey domain professional. Detection of plant diseases in early stage would facilitate farmers to boost the crop yield, that successfully improves country's gross domestic product.

V REFERENCE

1. MachineLearning: What it is and why it matters, 09 2016, [online] Available: www.sas.com

2. R. E. Schapire, "The boosting approach to machine learning: An overview" in Nonlinear estimation and classification, New York:Springer, pp. 149-171, 2003.

3. A. Ben-Hur, D. Horn, H. T. Siegelmann, V. Vapnik, "Support vector clustering", Journal of machine learning research, vol. 2, pp. 125-137, Dec 2001.

4. J. R. Otukei, T. Blaschke, "Land cover change assessment using decision trees support vector machines and maximum likelihood classification algorithms", International Journal of Applied Earth Observation and Geoinformation, vol. 12, pp. S27-S31, 2010.

5. Panigrahi, S. & Ting K.C. (1998) Artificial Intelligence for Biology and Agriculture, Kluwer Academic Press).

6. Mukhopadhyay S.C. (2012) Smart Sensing Technology for Agriculture and Environmental Monitoring. Vol. 146, Springer Berlin Heidelberg