International Journal of Engineering Applied Sciences and Technology, 2022
Vol. 6, Issue 12, ISSN No. 2455-2143, Pages 171-173
Published Online April 2022 in IJEAST (http://www.ijeast.com)

CROP DISEASE DETECTION BY KERAS USING CONVOLUTION NEURAL NETWORK

Kiran Annaso Kolekar, Siddhesh Vijayanand Jagtap, Shisheer Bharat Ghutugade, Dr. Ashok Kanthe
Dept. Computer Engineering,
Mahatma Gandhi Mission's College of Engineering and Technology (Mumbai University), Navi Mumbai, India.

Abstract: **Plants play a vital role in climate change, Agriculture industries, and a country's economy. Thereby taking care of plants is very decisive. Not only human beings but crops/plants are also carried out by several diseases caused by bacteria, fungi, and viruses.**
Pinpointing these diseases are take so much time and curing them is essential to prevent the whole crop from being devastated.
This paper is focused on a deep learning model to dig out diseases on plant leaves. But, In the future model can be combined with a drone or any other system to live to detect diseases from plants and report these diseased plants' location to farmers so that they can cure appropriately.
All-important steps which are required to carry out disease recognition on plant leaves are explained in the paper.
Healthy crop leaves and background images of corps are present in different classes, enabling the model to differentiate between not healthy leaves and healthy leaves from the environment by using the Convolution neural network.

Keywords: **Keras, Convolution Neural Network (Cnn), Image processing, Neural network training.**

I. INTRODUCTION

The problem of structured plant disease protection is closely related to the problems of defendable
Agriculture Inexperienced pesticide utilization can cause the development of end-less resistance to the pathogens, gravely reducing the capability to fight back. To reach the exact plant disease ailment a plant pathologist should possess good monitoring skills so that one can specify characteristic symptoms. different symptoms represent different diseases. If the disease is not detected properly then the curing plant is a task.
Having less knowledge of tools, illiteracy and non expert increase the difficulties of identifying problems. therefore professional plant pathologist is required.
Advance in technology is very helpful to identify accurate disease.
the practice of finding disease and curing it depends on computer vision. Neural networks or connectionist systems are a computational approach used in computer science and other research disciplines, based on a large collection of neural units (artificial neurons), loosely mimicking how a biological brain solves problems with large clusters of biological systems neurons connected by axons.
The neural networks work as same as a human brain. the way the human brain scans the surrounding neural network does the same. rather some neural network works more efficiently than the human brain.

II. LITERATURE SURVEY

There are already many papers published that proposed the methods of crop disease detection by CNN and Keras. we used some of them as a reference. A Convolutional Neural Network is a class of neural networks that specializes in processing data that has a grid-like topology, such as an image. A digital image is a binary representation of data that is visualized by the user. Keras is written in python and it is a very high-level API itis specially used for the neural network.
In this segment, we will talk through some of the subsist papers that used CNN and deep learning to classify images of crop leaves.
Classifying the plant disease into three namely Anthracnose, Cercospora Leaf Spot, and Bacterial Blight was suggested by Dr. Sridhathan C et al [2].MATLAB software is used for image processing. Performing image enhancement improves the quality by K-means and GLCM techniques. It can only classify infections like Anthracnose, Cercospora Leaf Spot, and Bacterial Blight.

Classifying types of rice diseases by extracting features from infected regions of the rice plant images was suggested by Phadikar et al [3]. Rice diseases are detected by: (i) Selection Features, (ii) Classifying Diseases (iii) Identification of the Infected Region, (iv) Rule Generation, and (v) Extraction Features. This is tested only on rice plants.
Applying Convolution Neural Network was suggested by Emanuel Cortes at Stanford University [4]. Depth, Stride, Zero-padding, Non-Linearity: the negative pixel values in the feature map are replaced by zero using ReLu. Under 5 epochs 80% in the training phase. By Segmenting based on the background there was no improved accuracy.

International Journal of Engineering Applied Sciences and Technology, 2022
Vol. 6, Issue 12, ISSN No. 2455-2143, Pages 171-173
Published Online April 2022 in IJEAST (http://www.ijeast.com)

An algorithm to identify visual disorder symptoms by color image processing was suggested by Camargo A et al [5]. The algorithm was divided into four stages: (1) pre-processing of images (2) image enhancement (3) segmentation of images (4) post-processing. Particular attention has been paid to the latest growth stages, that is when the crop is near harvest. The system is highly configured.

The health and detection of disease monitoring in plants Is key to sustainable agriculture was proposed by Sindhuja Sankaran et al [6]. The leaves affected by the citrus canker displayed comparable fluorescence production to that of chlorosis-affected leaves under field conditions. The atmospheric conditions influence the object's spectral reflectance Griffin and Burke, 2003.

Identification and classification of infected plant leave by Tensor Flow and Keras using a convolution neural network was suggested by Siva kumar, Nithin, Puneeth Reddy, Harshavardhan, Chetan Kumar[1]. disease identified by processing images

(i) Selection Features, (ii) Classifying Diseases (iii) Identification of the Infected Region, (iv) Rule Generation, and (v) Extraction Features.

III. PROBLEM STATEMENT

The problem of efficient plant disease protection is closely related to the problems of sustainable agriculture Inexperienced pesticide usage can cause the development of long-term resistance to the pathogens, severely reducing the ability to fight back. the diagnosis of diseases on time and the accuracy of diagnosis is a key factors in our agriculture. Exploiting common digital image processing techniques such as color analysis and thre sholding were used with the aim of detecting and classification of plant diseases. To Provide an easily approachable way to the farmers for their queries related to the crops.

IV. EXISTING SYSTEM

In the existing system, It is only Support Vector Machine (SVM) classification is used. An SVM is below the supervised learning model under machine learning. SVM's square measures are used largely for the study of classification and regression. To get an output, SVM should be paired with the training rule. In the existing system, the accuracy of accurate output is lower than in a purposed system.

V. PROPOSED METHOD.

We Proposed a method where the process starts with image capturing. Image captured by a digital camera, Further Pre-processed and enhance the image quality and eliminate the unwanted portion from the sample image.

In the proposed system at all stages of the plant leaf disease recognition research, felicitous data sets are needed, starting with the training levels to evaluate the quality of detection algorithms. All the photos accumulated for the dataset have been downloaded from cyberspace and checked on different sources by disease and plant designation.

The dataset is isolated into particular classes portraying outwardly definite plant leaf sicknesses from leaves.

The main thing we used in our methods is deep learning.

In deep learning, we used Neural networks which used multiple mathematical operations to break down a complex problem into smaller parts, which were solved individually. Each mathematical expression is called a neuron.

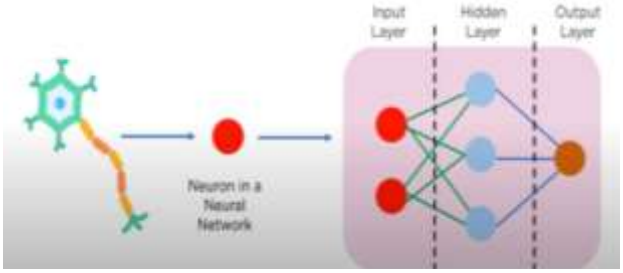

Figure 5.1. A simple model of deep learning.

VI. SYSTEM DESIGN.

We try to make our method less complicated as possible. Our farmers don't have so much time to create an account so we don't create a module such as account creation or log in. Creating accounts is a task for some farmers because of less education, and less knowledge of technology. The farmer just has to upload the image of leaves and he will get the result

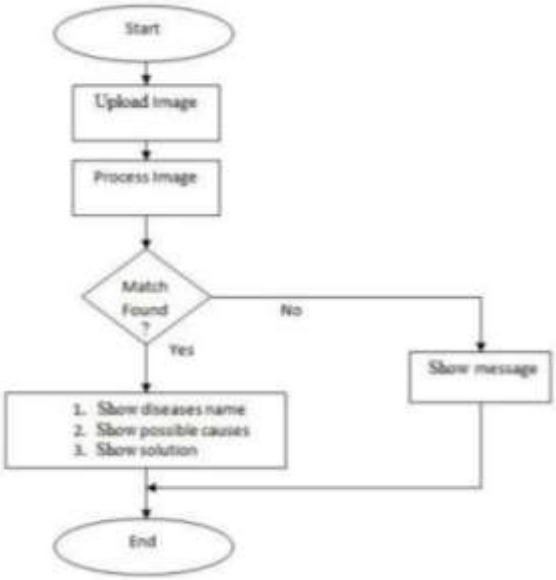

Figure 6.1. System design.

International Journal of Engineering Applied Sciences and Technology, 2022
Vol. 6, Issue 12, ISSN No. 2455-2143, Pages 171-173
Published Online April 2022 in IJEAST (http://www.ijeast.com)

VII. REFERENCES

[1]. Identificationan classification of infected plant leave by tenserflow and keras using convolution neural network was suggested by Sivakumar, Nithin, Puneeth Reddy, Harshavardhan, Chetan Kumar.

[2]. Dr. Sridhathan C and Dr. M Senthil Kumar, "Plant Infection Detection Using Image Processing", 2018.

[3]. Phadikar, Santanu, Jaya Sil, and Asit Kumar Das, "Rice diseases classification using feature selection and rule generation techniques", Computers and Electronics in Agriculture, 90, 76–85. doi:10.1016/j.compag.2012.11.001.

[4]. Plant Disease Classification Using Convolutional Networks and Generative Adversarial Networks", in Emanuel Cortes Stanford University, 2017

[5]. Camargo A and J.S Smith, "An image-processing based algorithm to automatically identify plant disease visual Symptoms", BioEng.,102(1), 921.doi:10.1016/j.biosystemseng.2008.09.030

[6]. Sindhuja Sankaran, Ashish Mishra, Reza Ehsani and Cristina Davis, "A review of advanced techniques for detecting plant diseases", Computers and Electronics in Agriculture,72(1),1–13 doi:10.1016/j.compag.2010.02.007

[7]. Sindhuja Sankaran, Ashish Mishra, Reza Ehsani and Cristina Davis, "A review of advanced techniques for detecting plant diseases", Computers and Electronic in Agriculture 72(1),1–13. doi:10.1016/j.compag.2010.02.007

[8]. Sari, Yuita Arum, R V HariGinardi, Riyanar to Sarno. "Assessment of Color Levels in Leaf Color Chart Using Smartphone Camera with Relative Calibration". Information Systems International Conference (ISICO), 2013: 631-636