International Journal of Advances in Engineering and Management (IJAEM)
Volume 3, Issue 8 Aug 2021, pp: 56-60 www.ijaem.net ISSN: 2395-5252

Voice-Based Crop Monitoring and Pest Preventing System

Madhura C B

Submitted: 30-07-2021 Revised: 06-08-2021 Accepted: 08-08-2021

ABSTRACT
We propose innovative voice-based crop information for Plant diseases are generally caused by pest, insects, pathogens and decrease the productivity to large scale if not controlled within time. Agriculturists are facing losses due to various crop diseases. It becomes tedious for the cultivators to monitor the crops regularly when the cultivated area is huge that is in acres. The proposed system provides the solution for regularly monitoring the cultivated area and provides automated disease detection using remote sensing images. The proposed system intimates the agriculturist about the crop diseases to take further actions. The objective of the proposed system is too early detection of diseases as soon as it starts spreading on the outer layer of the leaves. The proposed system works in two phases: the first phase deals with training data sets. This includes training both healthy and as well as diseased data sets. The second phase deals with monitoring the crop and identifying the disease using Canny's edge detection algorithm.

Keywords— Machine learning Algorithm, Data Mining, Agriculture, Image processing

I. INTRODUCTION

Agriculture is the backbone of our Nation. In the olden days, farmers used to guess the fertility of the soil and made assumptions to grow which type of crop. They didn't know about the moisture, level of water and particularly weather condition which terrible a farmer more. They use pesticides based on some assumptions which made lead to a serious effect on the crop if the assumption is wrong. The productivity depends on the final stage of the crop on which the farmer depends. To enhance the productivity of the crop thereby supporting both farmer and nation we have to use the technology which estimates the quality of crop and giving suggestions. The wireless sensor network is sensors of different types that are used to collect the information of crop conditions and environmental changes this information is transmitted through the network to the farmer or devices that initiate corrective action. Some disadvantages in communication must be overcome by advancing the technology to consume less energy and also by making the user interface ease of use.

In this paper, we propose SVM and KNN for accurate crop prediction. K-Nearest neighbor (KNN) is a lazy learner technique. This algorithm depends on learning by analogy. It is a supervised classification method. This classifier is used extensively for classification purposes. This classifier waits till the last before building some model on a specified tuple as compared to earlier classifiers. The training tuples are characterized in N-dimensional space in this classifier. This classification model looks for the k training tuples nearest to the indefinite sample in the case of an indefinite tuple. Then, this classifier puts the sample in the closest class. This algorithm can be implemented easily. Support vector machines classification model gives good performance on unknown data. The maximum margin classification model is the simplest example of this algorithm. This classification model provides a solution to the most fundamental classification issue. This issue is known as binary classification with linear separable training data. This classification model finds a hyperplane with the maximal margin.

The image processing techniques can be used in plant disease detection. In most cases, disease symptoms are seen on the leaves, stems, and fruit. The plant leaf for the detection of disease is considered which shows the disease symptoms.

II. LITERATURE SURVEY

The authors of [1] give a brief knowledge of Support Vector Machine. With the help of the Recommendation System model, this predicts the best suitable crop to the farmer and detects the pest that may affect as well as suggest pest control techniques. This focuses on that have applied SVM classification algorithm, Decision Tree algorithm, and Logistic Regression algorithm and we have found that SV classification model givesbetter accuracy as compared to other algorithms.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 3, Issue 8 Aug 2021, pp: 56-60 www.ijaem.net ISSN: 2395-5252

The author of [3] focuses on detecting plant diseases. Accordingly, detecting disease may be a key to stop the agricultural classified disease. The step-like loading an image, pre- Processing, Segmentation, extraction, and classification are involve illness detection. While the author of [4] focuses on the detection of diseases in the very early stage using image processing and the classification is made using a convolutional neural network. After the identification, a proper solution is going to provide to combat the infection in a very early stage to the farmers.

The author of [5] focuses on plant disease detection using an image processing approach This work utilizes an open dataset of 5000 pictures of unhealthy and solid plants, where convolution system and semi-supervised techniques are used to characterize crop species and detect the sickness status of 4 distinct classes. Author of [6] This research work helps beginner farmers in such a way to guide them for sowing reasonable crops by deploying machine learning, one of the advanced technologies in crop prediction. Naive Bayes, a supervised learning algorithm puts forth in the way to achieve it. The seed data of the crops are collected here, with the appropriate parameters like temperature, humidity, and moisture content, which helps the crops to achieve successful growth.

III. PROPOSED SYSTEM

In the proposed system Information on the availability of voice-based crop information and quality planting material from recognized nurseries or authentic farms is the primary information required for the farmers. Using this service, the farmers can get information on the availability of various planting materials with different varieties in their nearest farms/nurseries through their voice. This will help the farmers to procure quality planting materials from their nearest farm/nursery. Currently, the database is available for all the major planting materials produced directly under District level agricultural farmers, nurseries, Agricultural universities, research stations, etc.

The Proposed system will predict the most suitable crop for particular land based on soil contents and weather parameters such as Temperature, Humidity, soil PH. And also predict the pest disease.

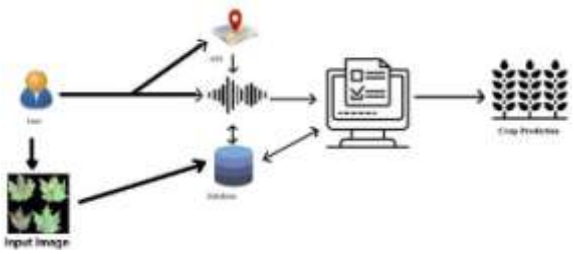


Fig.1: System Architecture

The Architecture of the proposed system consists of various blocks as shown in fig (1) as follows

1. DATASET

Data is composed of a different source and optimized for data sets. And the data is used to evaluate descriptively. Several abstract online outlets, like Kaggle, Google weather forestation, and data governance. The data sets such as region, climatic conditions, ph value, and seed data are used for crop prediction and better crop yields.

Forimage identification which includes, training phase to the evaluation phase where the performance of classification algorithms is evaluated, it is necessary to have huge data sets. Hence, the source of data is collected from the website. The images thus collated are labeled with four different categories-bacterial spots, yellow leaf curl virus, late blight, and healthy (to differentiate healthy leaves from affected ones). Subsequently, there is a need to enhance the dataset by adding images that are augmented.

2. ALGORITHMS

This work is broadly classified into 2 ways:

A. Croppredict ion

This section is broadly classified into 2 algorithms:

a. K-NNAlgorithm

The k-nearest neighbor (k-NN) method is a data mining technique considered to be among

International Journal of Advances in Engineering and Management (IJAEM)
Volume 3, Issue 8 Aug 2021, pp: 56-60 www.ijaem.net ISSN: 2395-5252

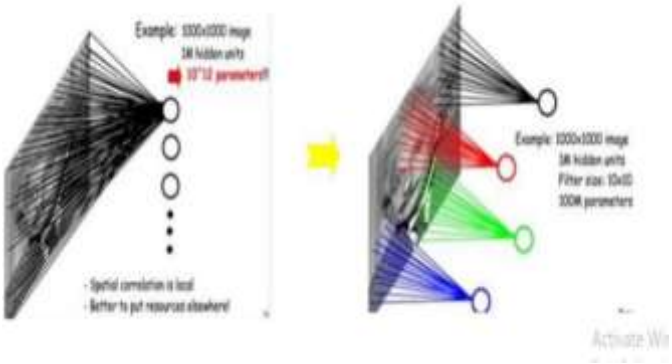
the top five techniques for data mining. In this, we consider each of the characteristics in our training set as a differentdimensioninsomespace,andtakethevalue an observation has for this characteristic to be its coordinate in that dimension, so getting a set of points in space. We can then consider the similarity of two points to be the distance between them inthis space under some appropriate metric. How the algorithmdecideswhichofthepointsfrom the training set are similar enough to be considered when choosing the class to predict for a new observation is to pick the k closest data points to the new observation and to take the most commonclass among these. This is why it is called the k Nearest Neighbour's algorithm.

b. SVMAlgorithm

SVM (Support Vector Machine) is a machine learning algorithm that comes under the supervised category and is used for binary classifications problems. Support vector machine breaks data into decision surfaces, which further divide the data into two hyperplane groups. Training points specify the vector which supports the hyperplane. Presumably, because of greater margins, a hyperplane with the greatest distance to the nearest learning data point usually has better margins and smaller errors, with a high classifier generalization.

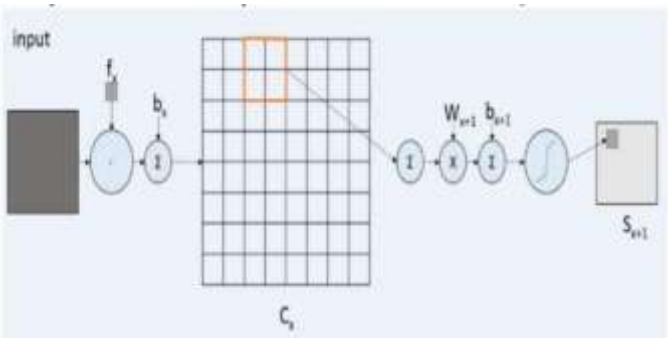
B. Pest diseasedetection

Convolution neural network algorithm is a multilayer perceptron that is the special design for the identification of two-dimensional image information. Always has more layers: input layer, convolution layer, sample layer, and output layer. In addition, in deep network architecture, the convolution layer and sample layer can have multiple. CNN is not as restricted Boltzmann machine, needs to be before and after the layer of neurons in the adjacent layer for all connections, convolution neural network algorithms, each neuron doesn't need to do feel a global image, just feel the local area of the image. In addition, each neuron parameter is set to the same, namely, the sharing of weights, namely each neuron with the same convolution kernels to deconvolution image.



CNN algorithm has two main processes: convolution and sampling. Convolution process: use atrainablefilterFx,deconvolutionoftheinputimage (the first stage is the input image, the input of the after convolution is the feature image of each layer, namely Feature Map), then add a bias bx, we canget convolution layer Cx. A sampling process: n pixels ofeachneighborhoodthroughpoolingsteps,become a pixel, and then by scalar weighting Wx + 1 weighted, add bias bx + 1, and then by an activation function,producenarrow n timesfeaturemapSx+ 1.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 3, Issue 8 Aug 2021, pp: 56-60 www.ijaem.net ISSN: 2395-5252



The key technology of CNN is the local receptive field, sharing of weights, subsampling by time or space,to extract features and reduce the size of the training parameters. The advantage of the CNN algorithm is that to avoid the explicit feature extraction, and implicitly to learn from the training data; The same neuron weights on the surface of the feature mapping, thus network can learn parallelly, reduce the complexity of the network; Adopting sub-sampling structure by time or space, can achieve some degree of robustness, scale and deformation displacement; Input information and network topology can be a very good match, It has unique advantages in speech recognition and image processing.

3. METHODOLOGY

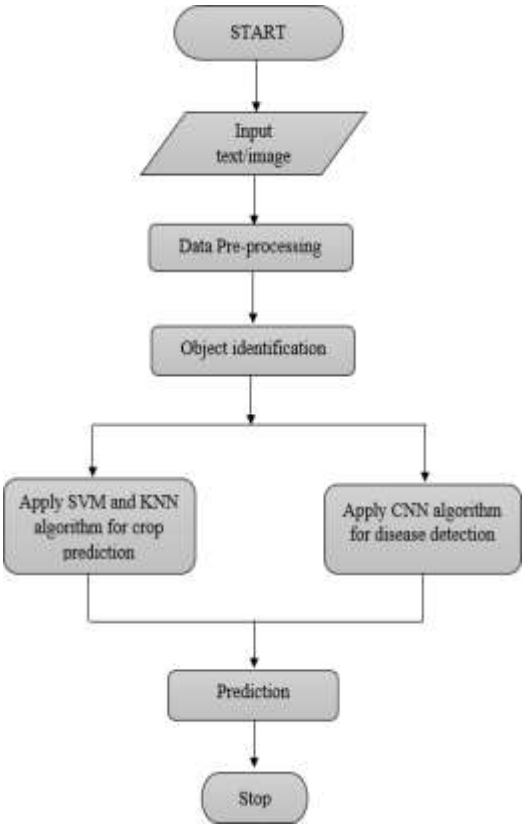


Fig 3: Flow Chart

The above flow chart shows the flow chart of theproposed system. In the proposed system, usershave touploadtheimageortexttoanapplicationthatwill

start pre-processing the data and detect the object in text or image and apply the SVM, KNN algorithms, and CNN algorithm to identify the crop and detect the disease in crop respectively and predict the result. The results are in the form of both text and voice-based.

Data analysis and Result display: After the crop prediction and the disease detection, the information regarding the solutions like Crop information, fertilizers, pesticides, and insecticides, etc. are given to the users in the form of both voice and text-based.

IV. RESULT ANALYSIS

Our model is designed by using Spyder IDLE (PYTHON 3.7.2) and the accuracy of our accounts to 89.26%. After training our model with a sample amount of data values we have successfully predicted the crop based on region given by the user and to predict the crop disease and to control pest to a quite a satisfactory level and the rules are induced from algorithms like SVM and Decision Tree and for disease detection CNN algorithm is used. The rules induced from these models help in building this system. The input is taken in a form and the training set formed is precisely classified. This model can predict for any situation and any crop and if it fails to predict it will show a message that couldn't predict.

V. CONCLUSION AND SCOPE OF THEPROJECT

In Fields like agriculture, medical, military, community developments, industrial automation, internet security, energy resources utilization many improvements are being made to develop solutions. So, while we were searching for a problem to solve, we learned that agriculture here is a way back when compared to other sectors. Hence this could be a major area where we could work on. Embedded system integrated with ML is the most advisable domain which can help us to reach our requirements. We developed a smart system that helps the farmers and agriculturalists to increase the yield through Voice-based crop information.

The scope of the project is that the system should be trained with a lot more data to achieve more accuracy. Farmers need to be a bit technically educated so that the system can be used in an appropriate manner. Studies should be made for all the other crops and also other kinds of pests that can be attached to a particular type of crop. It can be clearly observed that through all these methods, the agricultural sector can be improved a lot.

REFERENCES

[1]. Recommendationsystemforcropidentification and pest control technique inagriculture.
[2]. Machine Learning-based for Automatic Detection of Plant Diseases Using Image Processing.
[3]. Identification of Plant Disease using Image ProcessingTechnique
[4]. Disease Detection in Plants using Convolutional NeuralNetwork.
[5]. CNN based leaf disease identification and remedy recommendationsystem
[6]. Crop Prediction using MachineLearning.
[7]. Smart Pest Control System inAgriculture.
[8]. Smart Crop and Fertilizer PredictionSystem.Identification of Maize Leaf Diseases Using Improved Deep Convolutional Neural Networks.
[9]. Plant Disease Detection Using Machine Learning.
[10]. An AIoT Based Smart Agricultural System for PestsDetection.
[11]. Monitoringandforecastingfordiseaseandpest in crops based on WebGISsystem.
[12]. Application of Keywords Speech Recognition in Agricultural Voice InformationSystem.