

PESTICIDE DETECTION ON BANANA

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Abstract- It is commonly known that toxic pesticides have a negative influence on the production process and ultimately on the product quality of many industries. Therefore, it is reasonable to consider pesticide detection a crucial task in these production procedures in order to make relevant pesticide management decisions. However, the challenge here is the localization and classification of healthy and unhealthy fruits due to high similarity in features between them. Inspired by the achievement of the Deep Convolutional Neural Network (CNN), this project identifies a method of making predictions based on available images.

Keywords- Banana, Deep Convolutional Neural Network, Pesticides Detection

I. INTRODUCTION

It is a machine learning android application which is trained by a Banana dataset. The user inputs its specific Banana image to get the prediction whether it is healthy for consumption or not. The algorithm will calculate the percentage of presence of pesticides in Banana and classify as healthy or unhealthy. The result will be displayed on the android app itself. The working of these algorithms has been explained in the sections ahead. The algorithms have been trained using the data set obtained from University of California, Irvine. 75 percent of the entries in the data set have been used for training and the remaining 25 percent for testing the accuracy of the algorithm. Furthermore, some steps have been taken for optimizing the algorithms there by improving the accuracy. This system introduces a practical and applicable solution for detecting the class and location of diseases in banana plants, which represents a main comparable difference with other methods for plant diseases classification. These steps include cleaning the dataset and data preprocessing. The algorithms were judged based on their accuracy and it was observed that the CNN was the most accurate out of the three

with 64.4 percent efficiency. Hence, it was selected for the main application. The main application is a web application which accepts the various parameters from the user as input and computes the result.

II. PROBLEM STATEMENT

To reduce the consumption of unhealthy produce. To give unique solution for multiple produce. To provide higher accuracy over manual detection of pest. To give most promising tool that can be acceptable by all farmers and common people

III. LITERATURE SURVEY

Nguyen Tuan Nam and Phan Duy Hung [1] state that It is regularly realized that lethal irritations impact the creation procedure and eventually on the item nature of numerous ventures. Consequently, it is sensible to consider bother discovery a urgent undertaking in these creation strategies so as to settle on applicable vermin the executives choices. In any case, the test here is that limitation and order of various creepy crawly species are genuinely troublesome because of high comparability in highlights among them, and it is considerably additionally testing when especially managing those as of now got on traps. Roused by the accomplishment of the Deep Convolutional Neural Network (CNN), this paper proposes a strategy for recognizing different kinds of caught creepy crawly species by making expectation dependent on accessible pictures. Utilizing a database of 200 pictures (from a candy parlor plant) including around 3,000 bugs of 6 sorts, the precision paces of identification and grouping are about 84% and 86% separately

Farhana Sultana et.al [2] proposed that Right now, have talked about the progressions of CNN in picture arrangement assignments. We have

appeared here that in spite of the fact that AlexNet, ZFNet and VGGNet followed the design of customary CNN model, for example, LeNet-5 their systems are bigger and more profound. We have encountered that consolidating initiation module and lingering hinders with traditional CNN model, GoogLeNet and ResNet picked up preferable precision over stacking a similar structure squares once more furthermore, once more. DenseNet concentrated on highlight reusing to reinforce the component engendering. In spite of the fact that CapsNet arrived at condition of-the-art accomplishment on MNIST however it is yet to proceed just as past CNNs execution on high goals picture dataset for example, ImageNet. The consequence of SENet on ImageNet dataset gives us the expectation that it might turn out valuable for other errand which requires solid discriminative highlights.

Johny L et.al [3] introducing Recognition of vermin in the paddy fields is a significant test in the field of horticulture, consequently viable measures ought to be created to battle the invasion while limiting the utilization of pesticides. The strategies of picture examination are broadly applied to horticultural science, and it gives greatest security to crops, which can at last lead to more readily edit the executives and creation. Checking of bugs pervasion depends on labor, anyway programmed observing has been progressing so as to limit human endeavors and blunders. This examination broadens the usage of various picture preparing methods to recognize and remove creepy crawly bugs by setting up a computerized location and extraction framework for assessing bug densities in paddy fields. Analysis results shows that the proposed framework gives a straightforward, effective and quick arrangement in distinguishing nuisances in the rice fields. List Terms—Automated vermin the board, picture examination object discovery, object extraction. Find the world's exploration.

Mohammad Danish Gondal and Yasir Niaz Khan [4] state that This paper presents a programmed approach for early vermin discovery. Horticulture not just gives nourishment to the human presence, it is additionally a major hotspot for the economy of any nation. A large number of dollars are being spent to shield the harvests every year [1]. Creepy crawlies and vermin harm the yields and, in this manner, are exceptionally perilous for the general development of the harvest. One technique to ensure the yield is early nuisance discovery with the

goal that the harvest can be shielded from bother assault. The most ideal approach to think about the strength of the harvest is the convenient assessment of the yield. In the event that vermin are recognized, proper measures can be taken to shield the harvest from a major creation misfortune toward the end. Early location would be useful for limiting the use of the pesticides and would give direction to the choice of the pesticides. It has become a wide territory for inquire about now a days and a ton of research has been completed worldwide for programmed identification of bugs. Conventional technique for assessment of the fields is unaided eye assessment however it is extremely hard to have a nitty gritty assessment in huge fields. To look at the entire field, numerous human specialists are required which is over the top expensive and tedious. Subsequently, a programmed framework is required which can not just look at the yields to distinguish bother invasion yet additionally can group the sort of nuisances on crops. PC vision procedures give successful approaches to breaking down the pictures of leaves. Support Vector Machine (SVM) is utilized for characterization of pictures with and without bugs dependent on the picture highlights. This procedure is less complex when contrasted with the other robotized methods and gives better outcomes.

Ashwini Awate [5] proposed the presently a-days as there is restrictive interest for agrarian industry, successful development and improved yield of organic product is essential and significant. For this reason ranchers need manual checking of natural products from reap till its encouraging period. Be that as it may, manual observing won't give acceptable outcome all the occasions and they generally need palatable counsel from master. So it requires proposing a proficient brilliant cultivating method which will help for better yield and development with less human endeavors. We present a procedure which will analyze and arrange outside ailment inside natural products. Customary framework utilizes a large number of words which lead to limit of language. Though framework that we have thought of, employments picture handling procedures for execution as picture is simple path for passing on. In the proposed work, OpenCV library is applied for execution. K-implies grouping technique is applied for picture division, the pictures are list and mapped to their individual illness classes on premise of four element vectors shading, morphology, surface and structure of opening on the organic product. The framework

utilizes two picture databases, one for execution of inquiry pictures and the other for preparing of previously put away illness pictures. Artificial Neural Network (ANN) idea is utilized for design coordinating and arrangement of illnesses.

Muhammad Bilal et.al [6] proposed that Farming has basic impact in collecting any culture. Truth be told human development enormously relies on horticulture. Customary Filed pervasiveness and water the board in soil is vital to accomplishing objective of good creation. Plant and organic product ailments are enormously influencing quality and amount related with creation. Infections are basic now days. The pesticides and other unsafe excrement is greatest impediment right now. This paper breaks down sicknesses caused because of organic product collecting. Picture handling methods are utilized so as to break down debasement of natural product crop. Investigation of Filtering methods related with contortion discovery is introduced in thorough way.

IV. PROPOSED SYSTEM APPROACH

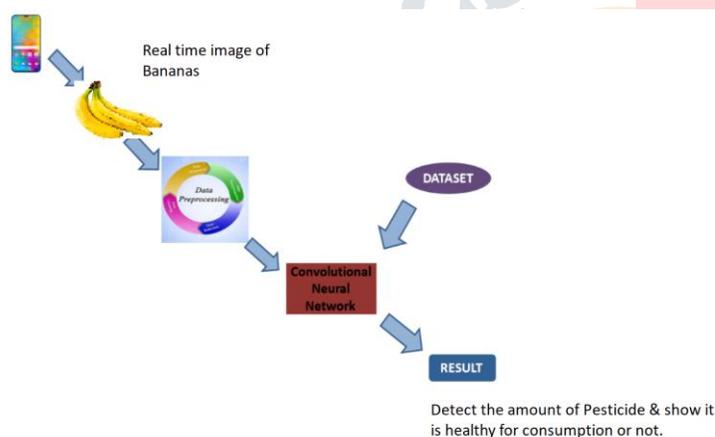


Fig.1 Block Diagram of Proposed System

Health is the first priority of almost all individuals. This project tries to put forth a concrete system that can help common people to have a quick guess about the quality of the substance they are going to buy and thus minimize any harm to their body. In a proposed system, we are proposing experiment on banana image dataset. We proposed a new Convolutional neural network based banana disease risk prediction model for limited diseases with higher accuracy. We are going to solve accuracy issue in using preprocessing of image and show the

banana is healthy or unhealthy with the help of CNN algorithm. We also considered the potential for adapting pre-trained deep learning CNN models to detect banana disease and pest symptoms using a large dataset of experts' pre-screened real field images collected from Africa and India. Convolutional neural networks (CNNs) represent an interesting method for image processing. A convolutional neural network has an input layer, an output layer and various hidden layers. Some of these layers are convolutional, using a mathematical model to pass on results to successive layers. CNNs are used for image classification and recognition because of its high accuracy.

V. ALGORITHMS IN PSEUDO CODE

1] Convolutional Neural Network (CNN):-

In proposed work we are using CNN which takes images frames as a input. After getting frames from image it will processed using image processing techniques for feature evaluation. We extract different features from those images regardless of their events in it consists. By using a series of mathematical functions we are going to identify the abnormal events. Every layer in CNN has capability to find out weights of images by using matrix evaluations which converts input to output with valuable functions. Layers of CNN used to identify fire events from extracted frames and give prediction by preserving high accuracy and less time.

- Step 1- Input banana image
- Step 2- Frame extraction from images
- Step 3- Image processing by using open-cv
- Step 4- Feature Extraction from images
- Step 5- Model generation
- Step 6- Disease Prediction

Four main layer working approach of CNN explained below:-

a) Convolutional Layer

We are going to extract different features of frames like pixel weight matrix calculations by using feature kernels. Perform mathematical convolutions

on frames, where every function uses a unique filter. This outcome will be in different feature maps. At the end, we will collect all of these feature maps and draft them as the destination output matrix of the convolution layer.

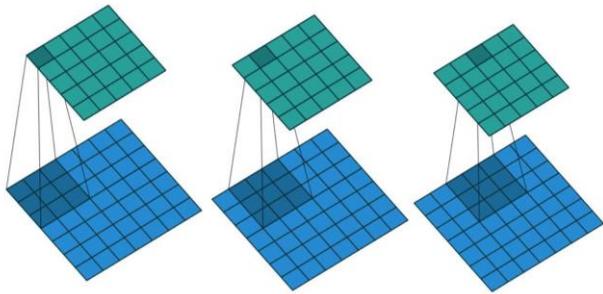


Fig. Convolutional Layer

b) Pooling

The expression of pooling is to constantly decrease the dimensionality to limit the number of factors and calculation in the network. This limits the time of training and maintains over fitting problem. The max Pooling extracts out the largest pixel value out of a feature. While pooling average is calculated for the average pixel value that has to be evaluated.

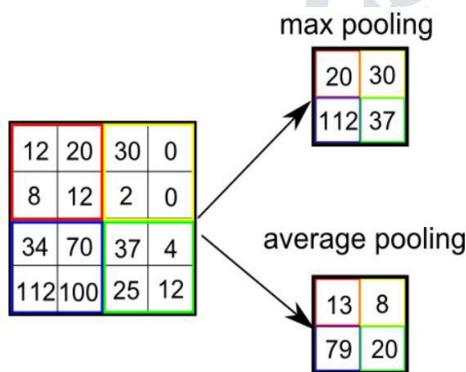


Fig. Pooling Layer

c) Flattening

Generally here we put the pooled feature into a single column as a sample input for further layer (transform the 3D matrix data to 1D matrix data)



Fig. Flattening Matrix

d) Fully Connection

A fully connected layer has full connections of neurons to all the nodes in the previous layer. The fusion of more neurons to evaluates accurately.

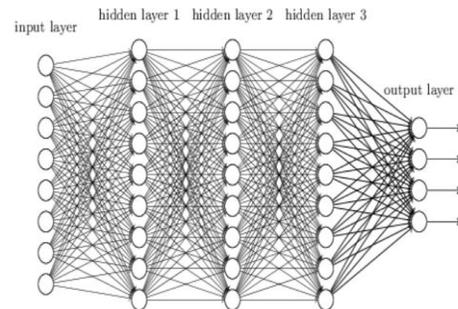


Fig. Fully Connected Layer

Calculate the vocabulary i.e., the total no. of unique words

6. Repeat the process.

VI.COMPARATIVE RESULTS

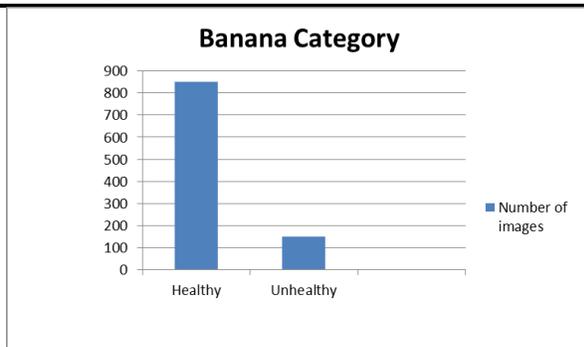
In our experimental setup, as shown in table 6.1, the total numbers of banana images were 1000. These category were then divided into two main categories; among which 850 were healthy, 150 were unhealthy.

Sr. No	Category	Number of Images
1	Healthy	850
2	Unhealthy	150

Table1 6.1: Classification of banana image dataset

VII.RESULTS

From above data, as shown in graph 7.1, total numbers of banana images were 1000. These images were then divided into two main categories; among which 850 were healthy, 150 were unhealthy



Graph 7.1: Classification of banana category

VIII.CONCLUSION

In this project, we have discussed the advancements of CNN in image classification tasks. We have seen although SVM ,Naïve bayes are used for Image classification Convolutional neural network has demonstrated excellent achievement in problems of computer vision, especially in image classification.

FUTURE WORK

In future work Using the machine learning concept newly trained dataset to fvarious fruits or vegetables can be used for even more accurate prediction system.The GUI can be an Andoid app where any user can capture the image and the system will predict whether it is healthy or unhealthy for consumption.

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