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DESIGNING A NOVEL TO IDENTIFY AND FORECAST DIFFERENT PLANT DISEASES USING LINEAR REGRESSION ALGORITHM

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Abstract

Plant diseases are a major threat to farmers, consumers, environment and the global economy. In India alone, 35% of field crops are lost to pathogens and pests causing losses to farmers. Indiscriminate use of pesticides is also a serious health concern as many are toxic and biomagnified. These adverse effects can be avoided by early disease detection, crop surveillance and targeted treatments. Most diseases are diagnosed by agricultural experts by examining external symptoms. However, farmers have limited access to experts. Our project is the first integrated and collaborative platform for automated disease diagnosis, tracking and forecasting. Farmers can instantly and accurately identify diseases and get solutions with a mobile app by photographing affected plant parts.

Keywords: *Introduction, Related work, Database System Module, Data Exploration, Data preprocessing, Visualization module.*

Introduction

Agriculture is fundamental to human survival. For populated developing countries like India, it is even more imperative to increase the productivity of crops, fruits and vegetables. Not only productivity, the quality of produce needs to stay high for better public health. However, both productivity and quality of food gets hampered by factors such as spread of diseases that could have been prevented with early diagnosis. Many of these diseases are infectious leading to total loss of crop yield. Given the vast geographical spread of agricultural lands, low education levels of farmers coupled with limited awareness and lack of access to plant pathologists, human assisted disease diagnosis is not effective and cannot keep up with the exorbitant requirements. To overcome the shortfall of human assisted disease diagnosis, it is imperative to build automation around crop disease diagnosis with technology and introduce low cost and accurate machine assisted diagnosis easily accessible to farmers. Some strides have been made in applying technologies such as robotics and computer vision systems to solve myriad problems in the agricultural domain. The potential of image processing has been explored to assist with precision agriculture practices, weed and herbicide technologies, monitoring plant growth and plant nutrition management.

Existing Work

In India alone, 35% of field crops are lost to pathogens and pests causing losses to farmers. Indiscriminate use of

pesticides is also a serious health concern as many are toxic and biomagnified. These adverse effects can be avoided by early disease detection, crop surveillance and targeted treatments. Most diseases are diagnosed by agricultural experts by examining external symptoms. However, farmers have limited access to experts.

Limitations Of Existing Work

1. Indiscriminate use of pesticides is also a serious health concern as many are toxic and biomagnified.

Proposed Work

In this project author using convolution neural network as artificial intelligence to train all plant diseases images and then upon uploading new images CNN will predict plant disease available in uploaded images. For storing CNN train model and images author is using cloud services. So using Al predicting plant disease and cloud is used to store data.

In this using smart phone to upload image but designing android application will take extra cost and time so we build it as python web application. Using this web application CNN model will get trained and user can upload images and then application will apply CNN model on uploaded images to predict diseases. If this web application deployed on real web server then it will extract users location from request object and can display those location in map.

Contributional Work

1. Accurately identify diseases and get solutions with a mobile app by photographing affected plant parts.
2. Cleaning and Visualization.

Application Modules

In this segment, the characteristics of the recommender

Data Exploration Module

1. Find unique number of leaf ids to check if a leaf has written multiple reviews.
2. Analyze number of drugs per condition by considering condition and number of drugs.

framework are reaching to be specified, additionally the detail of our drugs recommender framework system are aiming to be presented. Recommender framework has gotten to be a profitable investigation field as the advancement of counterfeit brilliantly advances. Not at all like most current recommender frameworks that specialize in e-business, book and pictorial suggestion, our framework points at giving a virtual fully fledged specialist for unpracticed amateurs and patients in abuse right pharmaceutical. Since high accuracy and strength is vital for such an online pharmaceutical recommender framework, in this way we tend to evaluate a few information preparing approaches to induce an genuine trade-off among the precision, productivity and quantifiability. In this proposed System, the framework mainly consists of five modules

1. Database module
2. Data preparation module
3. Recommendation model module
4. Model evaluation model and
5. Data visualization module.

Database System Module

It contains a drug review dataset with attributes like unique Id, drug name, condition(disease of leaf), date, useful count, reviews and ratings given by the leaf on the drugs.

Data Preparation Module

It comprises of information investigation and information preprocessing. The real-world information is crude information which can be fragmented, boisterous and messy. Thus, information arrangement is utilized to clean information. it comprises of missing value processing, correlation analysis and removing data redundancy.

Data preprocessing Module

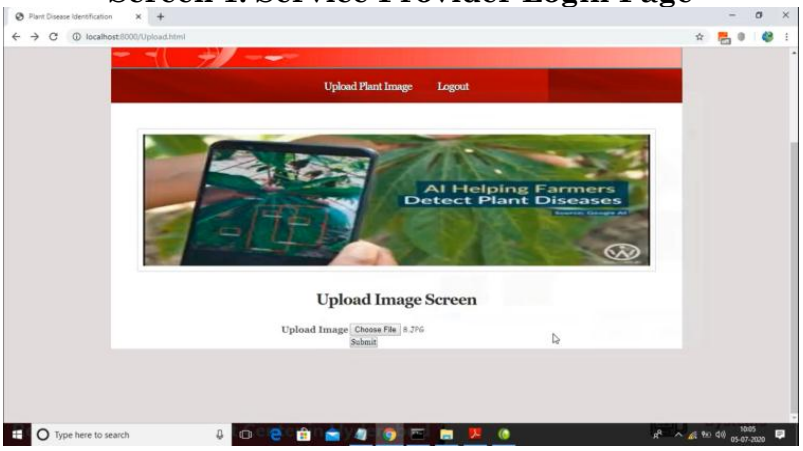
Find out the number of missing values for all the attributes. Find out the set of co-occurring words (gram) from the reviews starting from uni-gram.1-gram: Analyze the text with a single corpus. But it does not classify the emotion

well.
2-gram: it is hard to classify positive and negative reviews using bi-gram.
3-gram: Tri-grams are still unable to classify the positive and negative reviews.
4-gram: It classifies the emotions much better than their grams. Therefore, 4-gram is used to build the deep learning model.
Visualization Module It primarily gives the visualization innovation to show a few important information behind the determination case information.

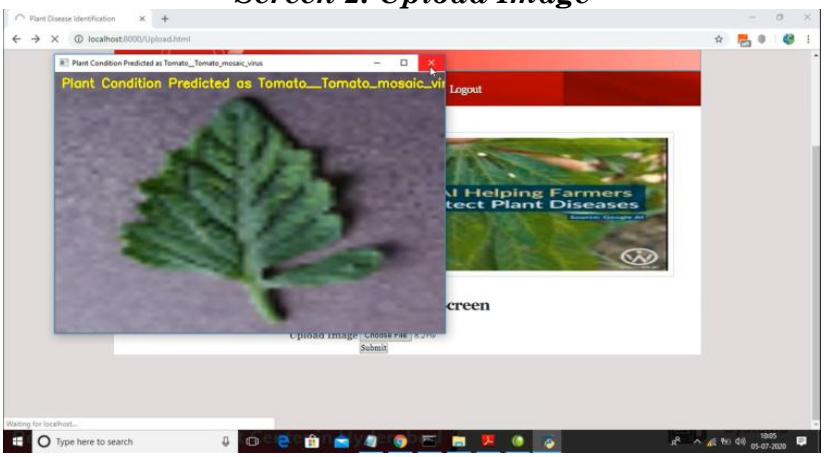
Results

A set of experiments carried out on stress analysis data obtained from kaggle com plants data. The performance evaluation of the system is performing using this dataset. The screenshots of various phases of drugs analysis system are as follows

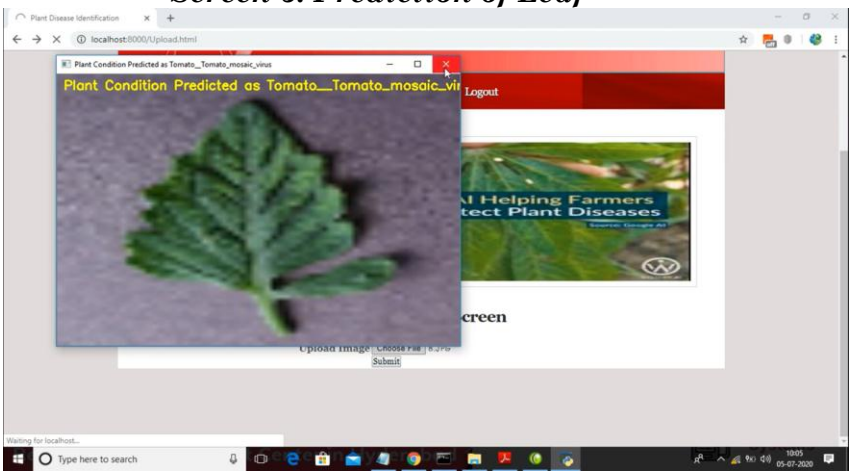
Screen 1: Service Provider Login Page



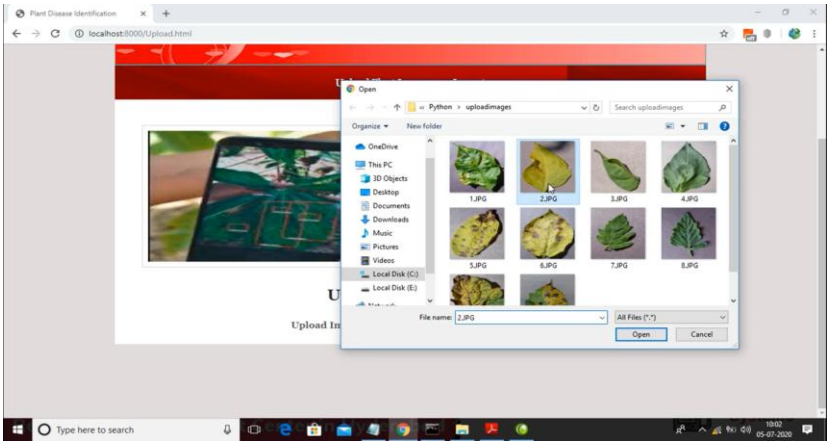
Screen 2: Upload Image



Screen 3: Prediction of Leaf



Screen 4:Plant Condition Prediction



Screen 5:Plant Condition

Conclusion

This paper presents an automated, low cost and easy to use end-to-end solution to one of the biggest challenges in the agricultural domain for farmers – precise, instant and early diagnosis of crop diseases and knowledge of disease outbreaks - which would be helpful in quick decision making for measures to be adopted for disease control. This proposal innovates on known prior art with the application of deep Convolutional Neural Networks (CNNs) for disease classification, introduction of social collaborative platform for progressively improved accuracy, usage of geocoded images for disease density maps and expert interface for analytics.

High performing deep CNN model "Inception" enables real time classification of diseases in the Cloud platform via a user facing mobile app. Collaborative model enables continuous improvement in disease classification accuracy by automatically growing the Cloud based training dataset with user added images for retraining the CNN model. User added images in the Cloud repository also enable rendering of disease density maps based on collective disease classification data and availability of geolocation information within the images. Overall, the results of our experiments demonstrate that the proposal has significant potential for practical deployment due to multiple dimensions – the Cloud based infrastructure is highly scalable and the underlying algorithm works accurately even with large number of disease categories, performs better with high fidelity real-life training data, improves accuracy with increase in the training dataset.

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