LEAF DISEASES DETECTION AND MEDICATION

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ABSTRACT

India is fast developing country and agriculture is the back bone for the countries development in the early stages. Now a day's technology plays vital role in all the fields but till today we are using some old methodologies in agriculture. Identifying plant disease wrongly leads to huge loss of yield, time, money and quality of product. Identification of plant disease is very difficult in agriculture field.Leaf disease detection requires huge amount of work, knowledge in the plant diseases, and also require the more processing time. The objective of this research is to make use of significant features and prediction is done using computer vision technique. This method mainly download the image from the server then it converts the image into a gray-scale by calculating its pixels and it shows out only the defected parts of the leaf.This approach can significantly support an accurate detection of leaf disease. We can extend this approach by using image processing technique. It displays the output in graphical view that is X and Y coordinates. The user can also view the output in mobile application by retrieving the result from the server.

Index Terms *- Natural Language Processing, Gray scale image, Maximum Likelihood Estimation, Machine Learning.*

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[1] INTRODUCTION

Developing countries like India the economy is mainly depends on agriculture. Due to plant diseases the quality and quantity of agriculture product is reduced. Some of the plant diseases do not have visibility during early stage it only appears at that final stage. The purpose of agriculture is not only to feed ever growing population but it is an important source of energy and a solution to solve the problem of global warming. Plant disease diagnose is very important in earlier stage in order to cure and control the disease [1-3]. In this method experts are involved who have the ability to detect the changes in leaf. Many times, different experts identify the same disease as the different disease. This method requires continuous monitoring of experts. Depending on the applications, many systems have been proposed to solve or at least to reduce the problems, by making use of image processing we are also some of the automatic classification tool. Using this technique, we can easily segment the plant disease and also the affected part of the leaf can be found.

[2] PROPOSED WORK

In the proposed system, this is done using the segmentation process which detects and classifies the image. Image processing is used for measuring affected area of diseases and to determine the difference in the colour of the affected area. It covers the survey based on the classification mechanism whether the affected leaf is from which type of plant it specifies the pixel values and represent them in grayscale images. It represents the result in the form of graphical view and it also retrieves from the server and can be viewed with the help of mobile applications. It shows the accurate pixel value of affected leaf. It needs less optimization.

A. EQUATIONS

Logistic Regression uses Maximum Likelihood

$$\beta^1 = \beta^0 + [X^T W X]^{-1}.X^T(y-\mu)$$

β is a vector of the logistic regression coefficients.

W is a square matrix of order N with elements $n_i\pi_i(1-\pi_i)$ on the diagonal and zeros everywhere else.

μ is a vector of length N with elements $\mu_i = n_i\pi_i$.

Estimation to obtain the model coefficients that relate predictors to the targets.

$$\text{Info(D)} = -\sum_{i=1}^{m} pi \log_2 pi$$

Decision tree algorithm uses information gain.
Another decision tree algorithm called CART uses GINI method to create split points.

$$\text{Gini(D)} = 1 - \sum_{i=1}^{m} \text{Pi}^2$$

B. ARCHITECTURE DIAGRAM

An architecture diagram is a graphical representation of a set of concepts that are part of architecture, including their principles, elements and components.

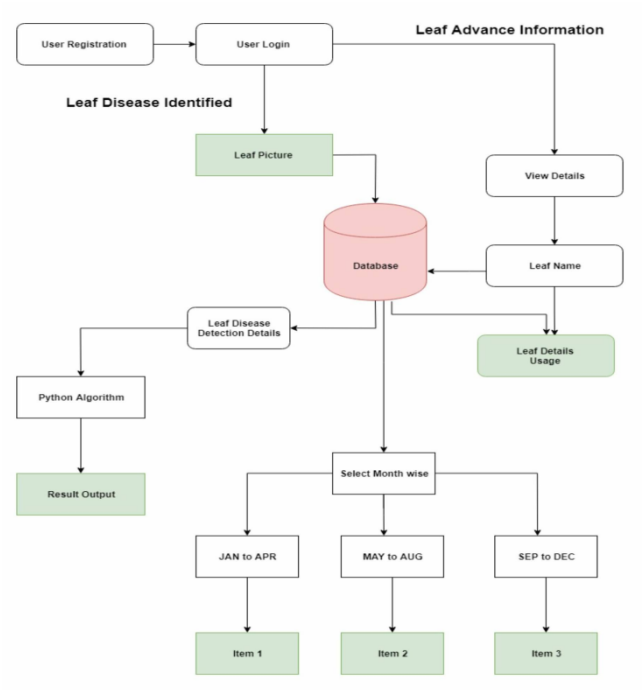

Fig: 2.1 Architecture Diagram

[3] IMPLEMENTATION

Software is divided into separately named and addressable components calledmodules that are integrated to satisfy problem requirements.Modularity is the single attribute of software that allows a program to be intellectually manageable

- LoginModule.
- Disease identificationmodule.
- Leaf Details & Season Descriptionmodule
- LaboratoryModule

[3.1] LOGIN MODULE

User first registers in the application by providing necessary details like name, phone number and email ID. After the registration process the user can login to the application by just entering the username and the password.

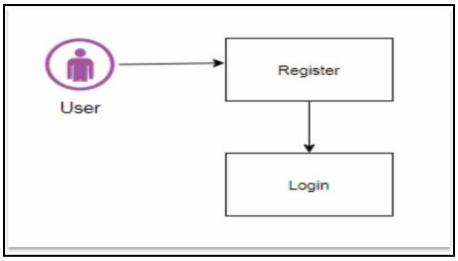

Fig 3.1 Login Module

[3.2] DISEASE IDENTIFICATION MODULE

The plant which is affected by the disease can be identified using this module. For this user captures the leaf of the image using the mobile camera. The captured image is stored in the database.

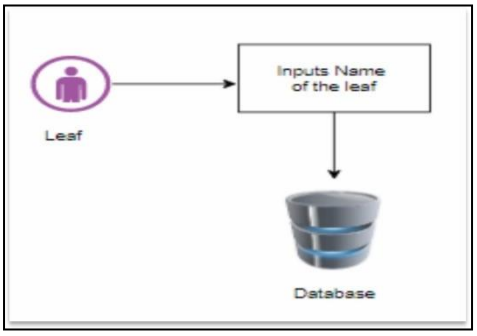

Fig 3.2 Disease Identification Module

[3.3] LEAF DETAILS MODULE

This module helps the user to gather information about a leaf. By just entering the name of the leaf user can view the usage of that leaf and also the details like favourite season in which the plantation can be done. Details entered by the user.

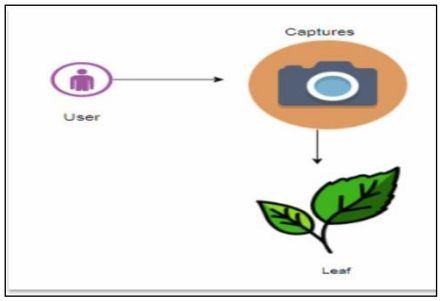

Fig3.3 Leaf Details Module

[3.4] LABORATORY MODULE

All the information sent by the user is retrieved from the database. It analyses the image captured by the user based on the algorithm and sends the result, whether the leaf is affected by the disease or not. Also sends the leaf details like the usage and season of plantation according to the name entered by the user. The laboratory module is given in the following diagram.

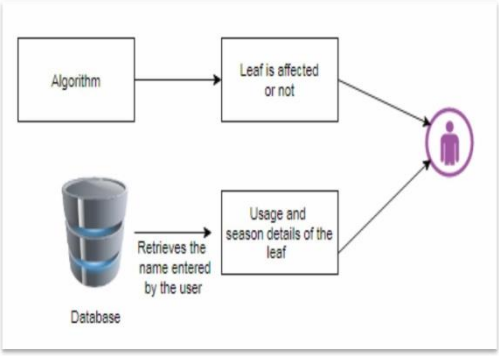

Fig 3.4 Laboratory Module

[4] SIMULATION RESULTS

The following diagram shows the output after the simulations done. In simulation, the user takes the picture of infected/healthy leaf and feed it to the system. The program will be automatically enhances the image using techniques before processing. Once the simulation is done the system produce the results in the form of graph as shown below.

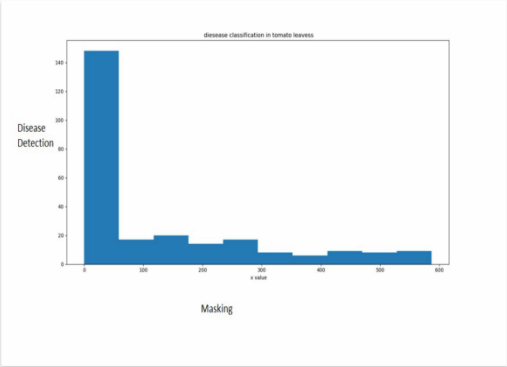

Fig 4.1 Graph for masking and disease detection

CONCLUSION AND FUTURE SCOPE

Based on the analysis, grayscale images are easy to process and implement. They have better clarity and suited for analysis than RGB images. Histogram equalization is used to enhance the contrast of the images and provides clear image to human eyes. So, these types of images will be used to analyses and diagnosis the plant leaves diseases and determines the diseases level of the plant leaves. Mobile phone has become available at the grass-root level providing different social and economic benefit. The aim of this proposal was to develop a user friendly automated system for the farmers that will help them in determining detection diseases of leaves without bringing an expert to the field.

In future, we are predicting the disease of the leaf and giving pesticides to the respective leaf that is affected by the disease. Now we are just identifying whether the leaf is affected by the disease or not. In future we will find the leaf disease and we will give pesticides to stop the leaf affecting by the disease. It can be integrated with other yet to be developed, methods for disease identification and classification using colour and texture analysis to develop an expert system for early disease warning and administration, where the disease type can be identified by colour and texture analysis and the severity level estimation by our proposed method since it is disease independent.

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