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# Grapes Plant Leaf Disease Detection And Diagnosis

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***Abstract:****Grape constitutes one of the most widely grown fruit crop in the India. Manual observation of experts is used in practice for detection of leaf diseases, which takes more time for further control action. Without accurate disease diagnosis, proper control actions cannot be taken at appropriate time. This is where modern agriculture technique is required to detect and prevent the leaf from different diseases. This paper aims to introduce a new approach for detection of grape leaf diseases using image processing, which will minimize the loss and increase its profit. In this system, classification is done using Support Vector Machine (SVM) and for segmentation process we use k-clustering method.Practical implementation of neural networks has been done using MATLAB.*

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## I. Introduction

Productivity of grape is highest in India around the world and there is scope to increase it further. Grape export from India is about 53,910 tonnes valued at 48,505 (1000US$) that makes a share of nearly 1.54% of total export of grapes in world. Grape is an important fruit crop in India. Due to disease on grape plant there is loss of about 10-30 % of crop. It is necessary to recognize the diseases at an initial stage and provide proper solutions so that maximum trouble can be avoided so as to enhance the profit.Farmers use manual observation method to judge the diseases. But sometimes this may be an inaccurate way. Many times farmer needs to call the experts for detecting the diseases which is also time consuming in large farms. An early detection of diseases is the major challenge in an agriculture field.Using digital image processing techniques number of applications has been found in various fields like industrial, medical, and agricultural processing etc. One of the applications of digital image processing techniques in agriculture is to detect plant disease. The leaf disease types are classified into bacterial, viral, fungal etc.The purpose of this paper is to monitor diseases on the stem/leaf/fruits of the crop and suggest solutions to them for healthy yield and productivity.Weed classification is a necessity in identifying. Later came few methods to detect the weedspecies for control. There are two types of weed automatically but due to lack of their accuracy they are based on the frequency of the edges present in them. Then they started using image processing.

## II. Material And Methods

The system model includes two parties: the user and the system server. In this module, user are the images of the plant leaf are captured through the camera. After Image Pre-processing, Image Segmentation, Feature efficient communication in CR-Networks. The CR technology allows Secondary Users (SUs) to seek and utilize Extraction, classification and treatment the image. he will perform next operations. Here, user upload image then this analysis image and processing image. Then system server is check the User upload image is disease oriented or not disease and its classification and also provide treatment.

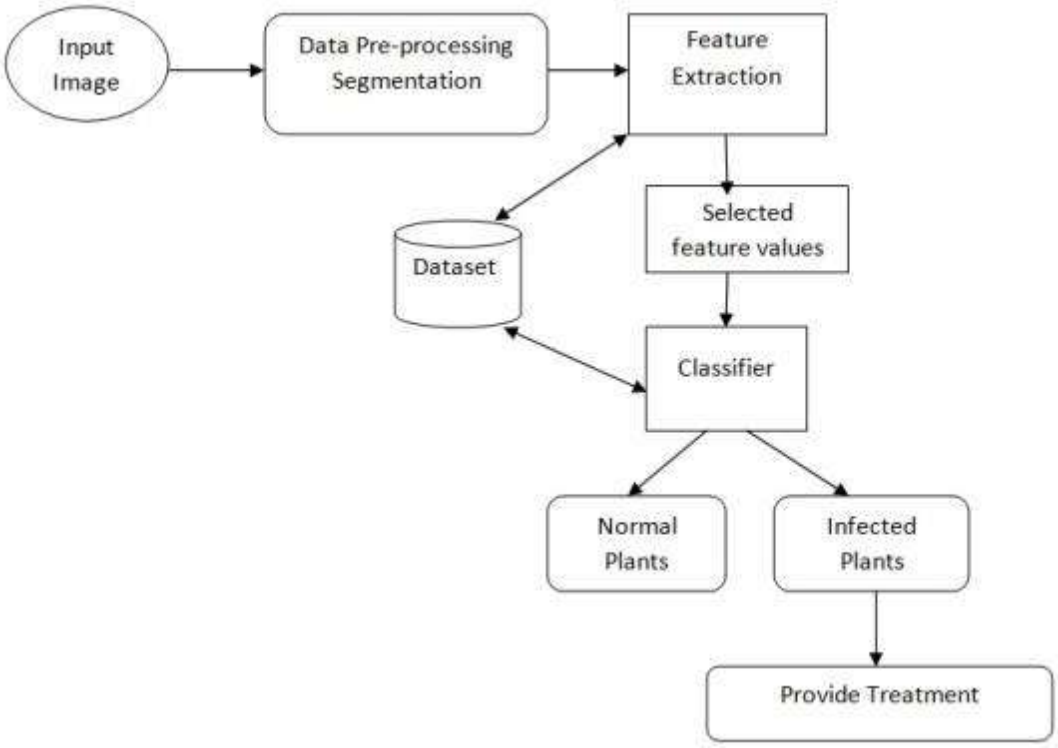


**Figure 4.1: Flow Chart**

**A.ImageAcquisition:**In Acquisition Process Diseases images of the plants are capture through the High Resolution camera. This image is in RGB (Red, Green and Blue) form. Colour conversion structure for the RGB leaf image is created, and then, a device independent colour space conversion for the colour variation manufacture is applied such as HIS model.

**B. Image Pre-processing:**To remove noise in image or other object removal. Image clipping i.e. cropping of the leaf image to get the interested image region. Image smoothing is done using the smoothing filter. Image enhancement is carried out for increasing the Contrast.

**C. Image Segmentation:**Segmentation means partition of image into diverse part of same skin tone or having some likeness dissection means parcelling of picture into different part of same elements or having some likeness. The division should be possible utilizing different Algorithms like otsu' strategy, k-means bunching, varying over RGB picture into HIS model.

D.**FeatureExtraction:**The input image is enhanced to protect information of the pretentious pixels before extracting chili folio colour from the background. The colour space equally is used to reduce effect of illumination and distinguish between disease and non-disease leaf colour inventively the resulting colour pixels are clustered to acquire groups of colour in the image

**E.Classification:** In plant leaf categorization leaf is classified based on its different morphological facial exterior. Some of the classification techniques used are Neural Network, Genetic Algorithm, Support Vector Machine, and Principal Component Analysis, k-Nearest National Classifier. Plant leaf infection classification has wide application incultivation.

**F**.**Treatment:**When the ailment is identifying the Treatment will be Provided Using SVM (Support Vector Machine) and arrangement Algorithm, Otsu Threshold Algorithm.

In the proposed system, our approach takes as input a termto categorize. As a vocabulary for the software technologysystem, they have data of all the methodologies, so the systemgets the data labels. According to the label, they will obtainall the data coming from a different technology. Apply NLPand Levenshtein distance algorithm. Then hypernyms will findlike final step of the proposed system contains of transformingthe hypernyms into a set of categories, possibly with someattributes. this system designed categories to represent generalhypernyms, with a focus on coverage: commercial ide for phpis a better (more precise) hypernyms than ide, but the latter is a better category (higher coverage). The attributes are meantto provide a flexible way to express the information lost whentransforming a hypernyms into a category. They representtypical variants of the category, but would not constitute validhypernyms on their own. To transform a hypernyms intocategory with attributes, this system start by removing all noninformativephrases like name of and type of this system alsotransform phrases indicating a collection, e.g., set of, into theattribute collection of, and remove it from the hypernyms. Thissystem constructed a small list of such phrases based on ourdevelopment set. If two or more occurrences of the word of or
of the word for remain in the hypernyms, this system do notparse the hypernyms, as its structure is possibly too complexfor our simple heuristics.

**A. Algorithms**

1) NLP: Natural language processing (NLP) is a subfield ofcomputer science, information engineering and artificial intelligence that deals with the interactions between computers and (natural) human languages, especially how to program computers to process and analyze large quantities of data. in natural language.

2) Similarity score: Calculate the string similar based on the similarity of the grams Q between the first paragraph of the section of the selected article and the extract of the label. The similarity is calculated for the first line of both texts, then the first two sentences, the first three, etc., till one of the inputs parameter runs out of sentences. The best similarity score is keep representative of the overall similarity between the two inputs parameter.

3) Levenshtein distance algorithm: The Levenshtein distance is a string metric to measure the difference between two sequences. Informally, the Levenshtein distance between two words is the minimum number of single-character edits (i.e. insertions, deletions or substitutions) required to change one word into the other. The Levenshteinalgorithm:calculates the least numberof edit operations that are necessary to modify onestring to obtain another string. The most common way of calculating this is by the dynamic programming approach. In proposed system Present system using this to match user entered question with available question in database.

**Input. :** Get user entered question.

**Working:**

Step1. Select user entered query

Step 2:. Select all data from available database

Step3. Pass the distance to match query question with available data. System will check question with according to entered query with available data. word by word with available answer.

Step4:One by one query will gets by visiting each data to specified distance.

Output: Get matched similar data.

**B. Mathematical Model :**This will be used to calculate accuracy in proposed system.It categorize query and result data from system. In the field of information retrieval, precision is the fraction of retrieved documents that are relevant to the query: precision=relevantdocument\retrieveddocumentsretrieveddocuments

In information retrieval, recall is the fraction of the relevant documents that are successfully retrieved.

recall=relevantdocument\retrieveddocumentsrelevantdocuments

In binary classification, recall is called sensitivity. It can be viewed as the probability that a relevant document is retrieved by the query.

**Statistical analysis**

Data was analyzed using SPSS version 20 (SPSS Inc., Chicago, IL). Student's *t*-test was used to ascertain the significance of differences between mean values of two continuous variables and confirmed by nonparametric Mann-Whitney test. In addition, paired *t*-test was used to determine the difference between baseline and 2 years after regarding biochemistry parameters, and this was confirmed by the Wilcoxon test which wasa nonparametric test that compares two paired groups. Chi-square and Fisher exact tests were performed to test for differences in proportions

of categorical variables between two or more groups. The level $P < 0.05$ was considered as the cutoff value or significance.

## III. Result

This proposed system describes different techniques of image processing for detecting the plant diseases. The diseases of plant is known at an early stage and the cure is suggested using different languages namely Hindi or English. Future scope of this system is that it is Cost efficient. In future, we should Minimize use of resources. As we are doing a desktop based system and in future we can make it mobile app based.

- To make an efficient use of image processing techniques.
- Provide solution without extra hardware requirement.
- To develop an Android application that is cost efficient.
- To minimize the use of resources.
- To make system easy to handle and accurate.

Categorize, it gives efficient time to categorize document according to entered string.Fig.2-Graph showed a pictorial representation of No.of matched document time. X-Axis contains no.of document and y-axis time to match query.Graph shows in proposed system how search time varies with respect to the number of documents. inour implementation, search time depends not only on the number of documents returned, but also on the number of documents in which the query to be categorize are present.

**Table I**
Execution Time For Categorize The Entered Query In No.Of Documents.

| Index | No of Documents | Query | Time to Categorize |
|---|---|---|---|
| 1 | 1000 | Query 1 | 101 |
| 2 | 2000 | Query 2 | 140 |
| 3 | 3000 | Query 3 | 190 |

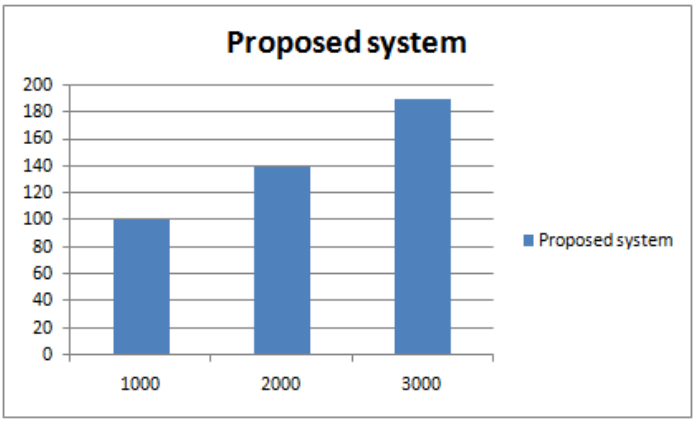


**Fig. 2. Categorize time for no.of documents.**

While performing acceptance testing check for the user is getting expected response by the system.That is when user is registered then he is able to login successful. Also when in system user share file to some user must available to download by that user. In engineering and its various sub disciplines, acceptance testing is a test conducted to determine if the requirements of a specification or contract are met. It may involve chemical tests, physical tests, or performance tests.

In systems engineering it may involve black-box testing performed on a system (for ex-ample: a piece of software, lots of manufactured mechanical parts, or batches of chemical products) prior to its delivery.

In software testing the ISTQB defines acceptance as: formal testing with respect to user needs, requirements, and business processes conducted to determine whether a system sat-isfies the acceptance criteria and to enable the user, customers or other authorized entity to determine whether or not to accept the system.

Acceptance testing is also known as user acceptance testing (UAT), end-user testing, operational acceptance testing (OAT) or field (acceptance) testing.

A smoke test may be used as an acceptance test prior to introducing a build of software to the main testing process. Testing is a set of activities conducted to facilitate discovery and/or evaluation of properties of one or more items under test.Each individual test, known as a test case, exercises a set of predefined test activities, developed to drive the execution of the test item to meet test objectives; including correct implementation, error identification, quality verification and other valued detail. The test environment is usually designed to be identical, or as close as possible, to the anticipated production environment. It includes all facilities, hardware, software, firmware, procedures and/or documentation intended for or used to perform the testing of software.

UAT and OAT test cases are ideally derived in collaboration with business customers, business analysts, testers, and developers. It's essential that these tests include both business logic tests as well as operational environment conditions. The business customers (prod-uct owners) are the primary stakeholders of these tests. As the test conditions successfully achieve their acceptance criteria, the stakeholders are reassured the development is progressing in the right direction.

User acceptance test (UAT) criteria (in agile software development) are usually created by business customers and expressed in a business domain language. These are high-level tests to verify the completeness of a user story or stories 'played' during any sprint/iteration. Operational acceptance test (OAT) criteria (regardless if using agile, iterative or sequential development) are defined in terms of functional and non-functional requirements; covering key quality attributes of functional stability, portability and reliability. The acceptance test suite may need to be performed multiple times, as all of the test cases may not be executed within a single test iteration.

The acceptance test suite is run using predefined acceptance test procedures to direct the testers which data to use, the step-by-step processes to follow and the expected result following execution. The actual results are retained for comparison with the expected results. If the actual results match the expected results for each test case, the test case is said to pass. If the quantity of non-passing test cases does not breach the project's predetermined threshold, the test suite is said to pass. If it does, the system may either be rejected or accepted on conditions previously agreed between the sponsor and the manufacturer.

The anticipated result of a successful test execution:test cases are executed, using predetermined data actual results are recordedactual and expected results are compared, and test results are determined.

The objective is to provide confidence that the developed product meets both the functional and non-functional requirements. The purpose of conducting acceptance testing is that once completed, and provided the acceptance criteria are met, it is expected the sponsors will sign-off on the product development/enhancement as satisfying the defined requirements (previously agreed between business and product provider/developer).

## IV. Discussion

Detection of fraud rating and malware in the application while downloading. Unlike existing solutions, we build this work on the observation that fraudulent and malicious behaviours leave behind tell-tale signs on app markets. We uncover these nefarious acts by picking out such trails. For instance, the high cost of setting up valid Google Play accounts forces fraudsters to reuse

their accounts across review writing jobs, making them likely to review more apps in common than regular users. Resource constraints can compel fraudsters to post reviews within short time intervals. Legitimate users affected by malware may report unpleasant experiences in their reviews. Increases in the number of requested permissions from one version to the next, which we will call permission ramps, may indicate benign to malware (Jekyll-Hyde) transitions. Previous mobile malware detection work has focused dynamic analysis of app executables as well as static analysis of code and permissions. However, recent Android malware analysis revealed that malware evolves quickly to bypass anti-virus tools. In addition, the efforts of Android markets to identify and remove malware are not always successful.

To make an efficient use of image processing techniques. Provide solution with least hardware requirement. To develop an Android application that is cost efficient, as android phones are widely available at low costs. Minimize the use of resources as farmers can't afford costly equipment. Easy to use and accurate so that farmers can adopt the application quickly. To Implement Plant Disease Detection System on Desktop by using Image Processing and this can be done using using following methods-

1. Blob detection method
2. HSV model

*1)*Important step toward the machine understanding of terminology is hypernym discovery, i.e., the discovery of the more general concept in a is-a relationship (e.g., AngularJS is a web application framework), which led to the development of many automated hypernym extraction tools. Unfortunately, discovering valid hypernyms is not sufficient to support the detection and monitoring of comparable software technologies. For example, commercial cross-platform IDE for PHP is a valid hypernym for PhpStorm, but the expression is too specific to constitute a useful category of technologies. Categorizing software technologies is a much more complex problem that requires additional abstraction and normalization..Softwaresare designed to be used a significant amount of time, therefore maintenance represents an important part of their life cycle. It has been estimated that a lot ofthe time allocated to software maintenance is spent on the program comprehension. Many approaches using the program structure or external documentation have been created to ease the program comprehension. However, another important source of information is still not widely used for this purpose: the identifiers. In this article, Present system propose an approach, based on Natural Language Processing techniques, that automatically extracts and organizes concepts from software identifiers in a WordNet-like structure: lexical views. Those lexical views give useful in- sight on an overall software architecture and can be used to improve results of many software engineering tasks. The proposal is validated on a corpus of 24 open source software's.

2. Measuring the similarity of words is important in accurately representing and comparing documents, and thus improves the results of many natural language processing (NLP) tasks. The NLP community has proposed various measurements based on WordNet, a lexical database that contains relation- ships between many pairs of words. Recently, a number of techniques have been proposed to address software engineering issues such as code search and fault localization that require understanding natural language documents, and a measure of word similarity could improve their results. However, WordNet only contains information about words senses in general-purpose conversation, which often differ from word senses in a software-engineering context, and the software-specific word similarity resources that have been developed rely on data sources containing only a limited range of words and word uses. In recent work, Present system have proposed a word similarity resource based on information collected automatically from StackOverflow. Present system have found that the results of this resource are given scores on a 3-point Likert scale that are over 50per higher than the results of a resource based on WordNet. In this demo paper, Present system review our data collection methodology and propose a Java API to make the resulting word similarityresource useful in practice.

## Conclusion

In this system, Image processing-based approach is used for plant diseases detection. This proposed system describes different techniques of image pro- cessing for several plant species that have been used for detecting plant diseases. The disease of the plant is known at an early stage and the cure is suggested using different languages (English, Hindi).

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