

IDENTIFICATION OF MEDICINAL PLANTS USING IMAGE PROCESSING TECHNIQUES

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Abstract— In this beautiful world there are a wide variety of plant species. Out of these wide variety of plant species some species will provide some medicinal importance to human beings. There are many diseases arising in this modern world. The main cause of disease are some bacteria's and virus. This has become a huge threat to all human beings and mankind. There are many plants with some nutritional requirement to fight against these diseases and make the life of human beings healthier. This will also help huma to increase their life span. In order to cure these diseases, we need medicine. These medicines can be found in some plants. Some plants will contain some nutritional requirement to fight against some disease. Eventual speaking about some metabolites to fight against various kinds of diseases.

I. INTRODUCTION

The need to find cure for various disease has become a need of this particular hour. These cures can be detected by using medicinal plants. There are a lot of medicinal plant in this world. To identify the various plants with required character to identify the right plant with nutritional qualities and vitamins to fight against various diseases.

Many plants will have many vitamins, minerals and nutrients. These will help us to fight against various kinds of diseases. This will help us to improve our health and maintain a disease prone lifestyle. But to identify such plant with various disease prone activities is a great challenge to us.

In this paper we are mainly focusing on image processing technique. With the image processing technique, we are going to identify the plants with various medicinal importance and derive the characteristics about these plants. In this image processing we recognizing the plants by using the various parts of the plants. The various parts include the stem, flower and leaf of the plants.

This we are going to identify the image and compare with another image within the datasets to get with result and

identify the image. For this we are making use of artificial neural network algorithms, machine learning algorithm and clustering which we discussed in this paper signals with the least amount of processing and communication latency possible.

These algorithms can be based on three major drives,

1. convolution-based algorithms
2. back propagations-based algorithms
3. Artificial neural based algorithms.

These algorithms are discussed below which are proven valuable for the NIDS.

II. DATASETS

The scientific search engines Sc Finder, Scopus, ScienceDirect, Pubmed, traditional Chinese medicine, and Google Scholar were used to perform our Literature review. Diabetes mellitus, hypoglycemic drugs, hyperglycemia plants, Gestational diabetes and natural goods were the keywords used. First-hand information on their traditional medicine was documented, and numerous inquiries were made to learn more about their knowledge, as well as their methods of diagnosis and treatment. Information was gathered regarding the specific plant part used for data collection, drug usage methodology, drug dosage, and drug quantity.

With the help of Bengaluru's Central Ayurveda Research Institute, the therapies 18 plants are identified. No matter the biological goal, our search criteria focused substances with diabetic pharmacological action from plants used in traditional medicine. As a result, course of the aspect of

search was neither focused or limited to biological targets. Every molecule contain in the information has been shown to have anti-diabetes pharmacological action in both human consumption and animal models or in vitro experiments. Additionally, it is noncured that the isolated substance with chemical characterization has in vivo in vitro action. 19d on the alleged activity, we generally y categorized the metabolic a s "hypogea" or "antihyperglycemic". "other Grunions, pound's data lacked any information on the type of activity. Hence it was categoric labelled as Diabetic." Additionally, a group of substances was labelled as "focused on complications" since it specifically targets OM-related issues. Our dataset 350+ unique **pho** species, each annotated with the following details: source plant, medicinal use of the plant, genus and family, alleged chemical activity, specifics of the mechanism of action (where a vailable). and geographic information about the plant. The dataset made available as part of the research adds to the databases of natural products made available under the property right.

III. METHODOLOGY

There are five main method in plant leaf disease detection. Actually, the processing schema firstly include acquisition of image through the digital camera. Then through acquisition we will obtain a clear picture of that image. Firstly we will take RGB image of the plant. We will then subject the plant to following steps:

- 1) Acquisitions of image
- 2) converting image into color image
- 3) Segmentation of the image components;
- 4) collecting useful segments
- 5) Computing the texture features;
- 6) Configuring the neural networks for recognition.

1.ACQUISITION OF IMAGE

In this step we are going to acquire the image of the medicinal plant. This we are going to acquire basically using the camera. Then we are going to save the image within the gallery and perform the required operation.

2.CONVERTING IMAGE TO COLOR IMAGE

In this step we are going to perform the operation of converting the scanned image into the color image. Basically, we are going to preprocess the image. We are going to remove all the detractions in the image. This will be going to help us in obtaining the clear image of the plant. Obtaining a clear image will later help us to easily classify the plants. We could easily recognize the part by annotation without much error in identifying the plant.

3.SEGMENTAION OF IMAGE COMPONENT

Basically, we are going to identify the plant image using the plants leaf and flower. So, we are going to

use the artificial neural network algorithm to get the image of the parts of flower and leaf. There are lot of plant species and it's very difficult to identify the entire species. So, we are going to identify them with the parts of flowers and leaf i.e. by comparing them with one stored in database.

4.COLLECTING USEFUL SEGMENTS

We are basically going to identify the plant with the help of plant stem and leaf. So, we are going to collect them. We will have annotated portion in the datasets that we will going to compare it the ones which will be there in the captured image. This will going to give us the clear picture of the plant.

5.COMPUTING THE TEXTURE FEATURUES

Basically, in computing we are going to identify the parts of the parts which we are basically going to use in order to identify with the plants in the datasets. It includes identifying the parts of the plant. Identifying the parts such as the flower and leaves of the plant. We are using flower and leaves because we have annotated these parts in the plant for plant identification. By comparing these two parts mainly we are going to identify with plants.

6.CONFIGURING NEURAL NETWORK FOR RECOGNISATION

The process of identifying the image and comparing will be done on the basis three algorithms. These three algorithms include the convolution based algorithm, back propagation-based algorithm, artificial neural based algorithm. Using these algorithm we are going to identify the type of plants.

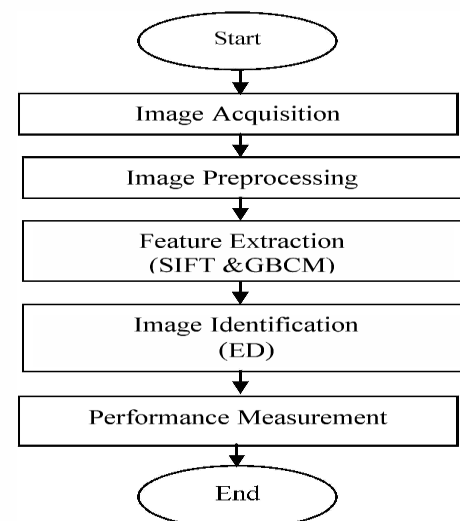


Fig 1: Research Flowchart

IV. PERFORMANCE MEASUREMENT

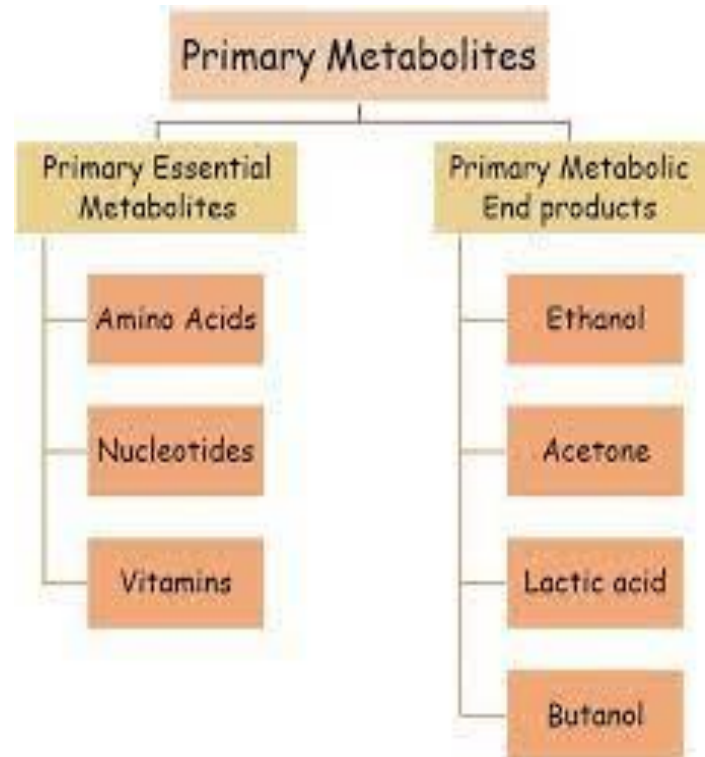
The texture and color will show a greater correlation with each other. Including all the features will show degradation and slow in training. There are two approach in features selection. They are 1. sequential feature selection 2. relief feature selection. We have feature research given below based on the algorithm. The 19 features are selected and CV accuracy of 0.934 as shown in the table.

Sr. No.	Feature Name	Cross-Validation Accuracy
1	Correlation	0.704019
2	Autocorrelation	0.718989
3	Sum of Squares	0.728080
4	Standard Deviation of Blue	0.760980
5	Maximal correlation coefficient	0.768141
6	Information measures of correlation (2)	0.770524
7	Mean of Blue	0.775902
8	Sum Variance	0.783225
9	Sum Entropy	0.802779
10	Cluster Prominence	0.802957
11	Standard Deviation of Red	0.821492
12	Uniformity	0.831278
13	Contrast	0.851472
14	Difference entropy	0.859829
15	Homogeneity	0.880204
16	Entropy	0.908171
17	Mean of Green	0.914150
18	Inverse difference	0.930732
19	Inverse difference moment normalized	0.934014

V. BACKGROUND

After the plant identification it is necessary to know the basic things available in plant to fight against various kinds of diseases. The things include primary metabolites, secondary metabolites. The primary metabolites include carbohydrates, organic and amino acids. Secondary metabolites are organic waste which will protect against the bacteria. They are basically necessary for the plants to adapt to the environment. Sometimes these will act as medicines for human beings' diseases. Primary metabolites such as nutrients provides basic requirement for body to do the work. Other hand proteins are building block for the body. They help in building muscle for human beings. Vitamins helps in metabolism and several nutrients in the human body to protect our body and thus which is going to help us to improve our immune system. Another amino acid which is protein will help in muscle building, growth development in the life of an human being.

Secondary metabolites will basically help us to fight against various diseases caused by fungi bacteria, viruses. A chart representing contents of plants that help to fight against diseases as shown below.



VI. ALGORITHM

1. KNN Algorithm

The easiest and most basic method of clustering by splitting, known as K-means, divides the objects into k parts (k n). K-means is a centroid- based methodology. Because the mean value of the cluster is higher when a value is distant from the median of the data, the k-means is particularly useful for locating outliers.

It is expected in this outlier identification model that normal behavioral patterns occur far more frequently than outliers or aberrant behaviors.

2. ANN (Artificial Neural Network)

ANN algorithm is based on a large number of basic neural units (artificial neurons), which are roughly equivalent to the observed behavior of the axons in a real brain. Biological neurons and their behaviors have inspired for the basis of ANN algorithms. They include one or more hidden -

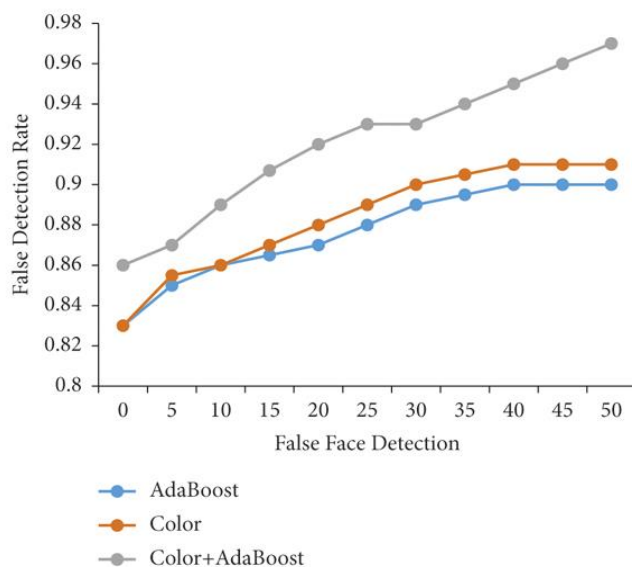
layers, their weight is processed for the output to decide the concurrent layers. ANN algorithms capture distinctly complex and relationships that are non-linear joining both controllable and exposure variables. These systems thrive in areas where the solution or feature identification is challenging to describe in a conventional computer programmer because they are self-learning and taught rather than explicitly coded.

3.CONVOLUTION NEURAL NETWORK

Convolution neural network basically used to compare the image with respect to the image in the datasets. Generally, we are making use of small preprocessing tracks in order to make contact with another image. The classification will be based on the channel where the channel will be built based on various operation in order for us to identify with the image. CNN mainly consist of two layers. They are 1. convolution layer. parameter layer. The convolution layer has open fields which will help to fetch with the information. The parameter is a centered square CNN. The system will primarily be going to select with adequate one.

RESULT

By this we are able to identify with type of medicinal plant. This will help people to easily identify with plant. By identifying the plant, they can easily prepare medicine for the disease. They will also be able to fight against various kinds of diseases. Requirement of plants to fight against the various diseases such as nutrients, vitamins, minerals to fight against various sort of the diseases. By comparing the research, we will get an image recognition result as follows.



CONCLUSION

The paper summarizes the image recognition technique of various medicinal plants. The different methods of image recognition. We also see various algorithm which will help in image segmentation and will help in this research. The various ways in which image segmentation is done. We also seen through the possible result of image recognition. The various

Plant variety of nutrients which will going to help us fight against various kinds of diseases.

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