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Unearthing of Medicinal Plants Using Deep Learning

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Abstract: ***Plants are an essential and valuable resource, which provides us with food, fiber, medicine, and all other basic needs. The efficacy of the dataset is revealed by comparing pre-trained deep convolution neural network architectures such as Inception V3 and Inception Resnet V2. This paper will focus on expanding the dataset to benefit stakeholders and thus, enriches society with the knowledge of herbs and their medicinal properties.***
Keywords: Medicinal Plant, Convolutional neural network, Image Processing, Identification, Automatic, Ayurveda.

I. INTRODUCTION

Ayurveda is the ancient Indian system of healing using medicinal plants available naturally in the Indian subcontinent, also called as the mother of healing arts. History says, Ayurveda originated more than 5,000 years ago. According to WHO, 65% to 80% of world population uses medicinal plants as medicines for various diseases. Because of environmental factors and lack of awareness about medicinal plants in human beings, plants are becoming extinct and rare. This paper will give brief review about medicinal plants identification and classification using different technologies used in preprocessing, feature extraction and classification phases.

A. Objective

The project aims at designing a web application for flora identification that helps in providing medicinal knowledge to common people.

B. Existing Sysem

It is a mobile app based on leaf image. They used a local binary pattern to obtain leaf texture. They use neural networks to classify the image. Now, we have developed Medical Leaf using combinations of leaf features such as shape, color, and texture. As a result, it will increase their resources, capital, and economic wealth.

C. Proposed System

The proposed System takes plant image as an input and classifies it based on leaf features. it is a real-time work. This system includes diseases that can be cured by the respective plants.

II.LITERATURE SURVEY

A.Gopal et.al [1] implement a system using image processing with images of the plant leaves as a basis of classification. The software returns the closest match to thequery. The proposed algorithm is implemented and the efficiency of the system is found by testing it on 10 differentplant species.
The software is trained with100 (10 number of each plant species) leaves and tested with 50 (tested with different plant species) leaves. The efficiency of the implementation of the proposed algorithms is found to be 92%.
Umme Habiba et.al [2] In this paper, for automatically classifying medicinal plants, they present a Multichannel Modified Local Gradient Pattern (MCMLGP), a new texture-based feature descriptor that uses different channels of color images for extracting more significant features to improve the performance of classification. Auther have trained their proposed approach using SVM classifier with arious kernels such as linear, polynomial and HI. In addition, used different feature descriptors for comparative experimental analysis with MCMLGP by conducting the rigorous experiment on our own medicinal plants dataset. The proposed approach gain higher accuracy (96.11%) thanother techniques, and significantly valuable for explorationand evolution of medicinal plants classification.

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R.Janani et.al[3] have proposed a method for the extraction of shape, color and texture features from leaf images and training an artificial neural network (ANN) classifier to identify the exact leaf class. The key issue lies in the selection of proper image input feature to attend high efficiency with less computational complexity. they tested the accuracy of network with different combination of input feature. the test result on 63 leaf images reviles that this method gives 94.4% accuracy with a minimum of 8 input features. this approach is more prominent for leaf identification system that have minimum input and demandless computational time.

Vijayashree.T et.al [4] has created database with127 herbal leaves. For creating a database 11 texture parameters are taken into account. The parameters are Sumof Variance, Inverse Difference Moment, Aspect ratio, Correlation, Sum Entropy, Mean, and Sum Average. Gray level co-occurrence matrix (GLCM) is used for determiningthe parameters like entropy, homogeneity, contrast and energy. A test image is taken and compared with the database; the dissimilarity is calculated with the extracted parameters. The one with least dissimilarity is identified asthe leaf and the output is displayed.

Venkataraman et.al [5] a system is developed which would provide a solution for identifying the plant and providing it's medicinal values, thereby helping in the cure of many ailments in a natural way. This paper discusses about the dataset collection, feature extraction using texture and HOG and thereby classifying based on Support Vector Machine algorithm.

Shitala Prasad et.al [6] These paper presents a new and efficient technique for leaf acquisition.The image is transformed to device independent lαβ color space that is further used to compute VGG-16 feature map. This feature map is re-projected to PCA subspace to optimize the performance for species recognition. To prove the robustness, the paper uses two different types of plant leaf datasets.

Dileep M.R et.al [7] This work proposes AyurLeaf, a Deep Learning based Convolutional Neural Network (CNN) model, to classify medicinal plants using leaf features such as shape, size, color, texture etc. This research work also proposes a standard dataset for medicinal plants, commonly seen in various regions of Kerala, the state on southwestern coast of India. The proposed dataset contains leaf samples from 40 medicinal plants. A deep neural network inspired from Alexnet is utilised for the efficient feature extraction from the dataset. Finally, the classification is performed using Softmax and SVM classifiers. Our model, upon 5-cross validation, achieved a classification accuracy of 96.76% on AyurLeaf dataset. AyurLeaf helps us to preserve the traditional medicinal knowledge carried by our ancestors and provides an easy way to identify and classify medicinalplants.

C.Amuthalingeswaran et.al [8] had built a model (Deep Neural Networks) for the identification of medicinal plants. To train the model auther used around 8,000 images belonging to four different classes. Finally, arrived with goodaccuracy of 85% when testing with images taken from the open field landareas.

Manojkumar P. et.al [9]This paper explores feature vectors from both the front and back side of a green leaf along with morphological features to arrive at a unique optimum combination of features that maximizes the identification rate. A database of medicinal plant leaves is created from scanned images of front and back side of leavesof commonly used ayurvedic medicinal plants. The leaves are classified based on the unique feature combination. Identification rates up to 99% have been obtained when tested over a wide spectrum of classifiers. The above work has been extended to include identification by dry leaves anda combination of feature vectors is obtained, using which, identification rates exceeding 94% have been achieved

III.SYSTEM MODEL

A. Data Exploration



Fig -1: Medicinal plants a-Alovera, b-Coriander, c- Drumstick, d-Hibiscus, e-Mint, f-Neem, g-Papaya, h-Peepal, i- Rui, j-Tulasi

B. Pre-Processing

Resizing and reshaping the images into appropriate format to train our model.

C. Training

Use the pre-processed training dataset to train our model using CNN with a Inception V3, Inception Resnet V2 methods.

D. Classification

The results of our model are then display medicinal plant images with their uses.

IV. RESULTS & ANALYSIS

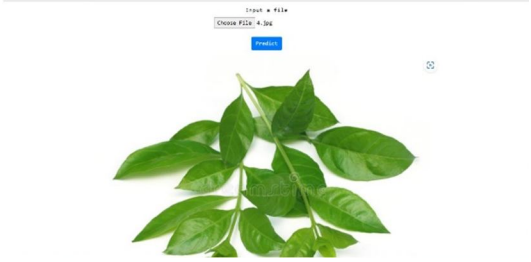
A. Upload Image

The user has to upload an image which needs to be classified.

B. View Results

The classified image and results are viewed by user.

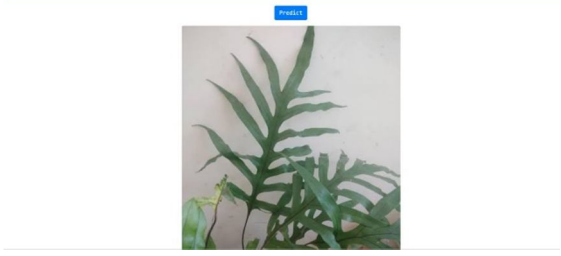
V. SCREENSHOTS





Result

Henna -antiseptic for fungal or bacterial skin infections -Relief from headaches -Treats a variety of skin conditions -Promotes healthy hair





Result

invalid

VI.CONCLUSION

Automatic identification and classification of medicinal plants will provide medicinal knowledge to common people and farmers which help in knowing properties of plants. The combination of shape, color and texture features result in displaying diseases that are cured with an accuracy of 99.54 %. The results shown in this technique are very promising and thus indicate the aptness of this algorithm for medicinal plant identification systems. This work can be extended to a larger number of Plants species with improved accuracy in future.

VII. FUTURE WORK

The proposed system is not suitable for the live capture of image. In future work, adding a camera option to the project could greatly enhance its utility and usability for researchers and practitioners in the field of natural medicine. Incorporates faster GUI that can deliver facts like advantages, usage of those plants.

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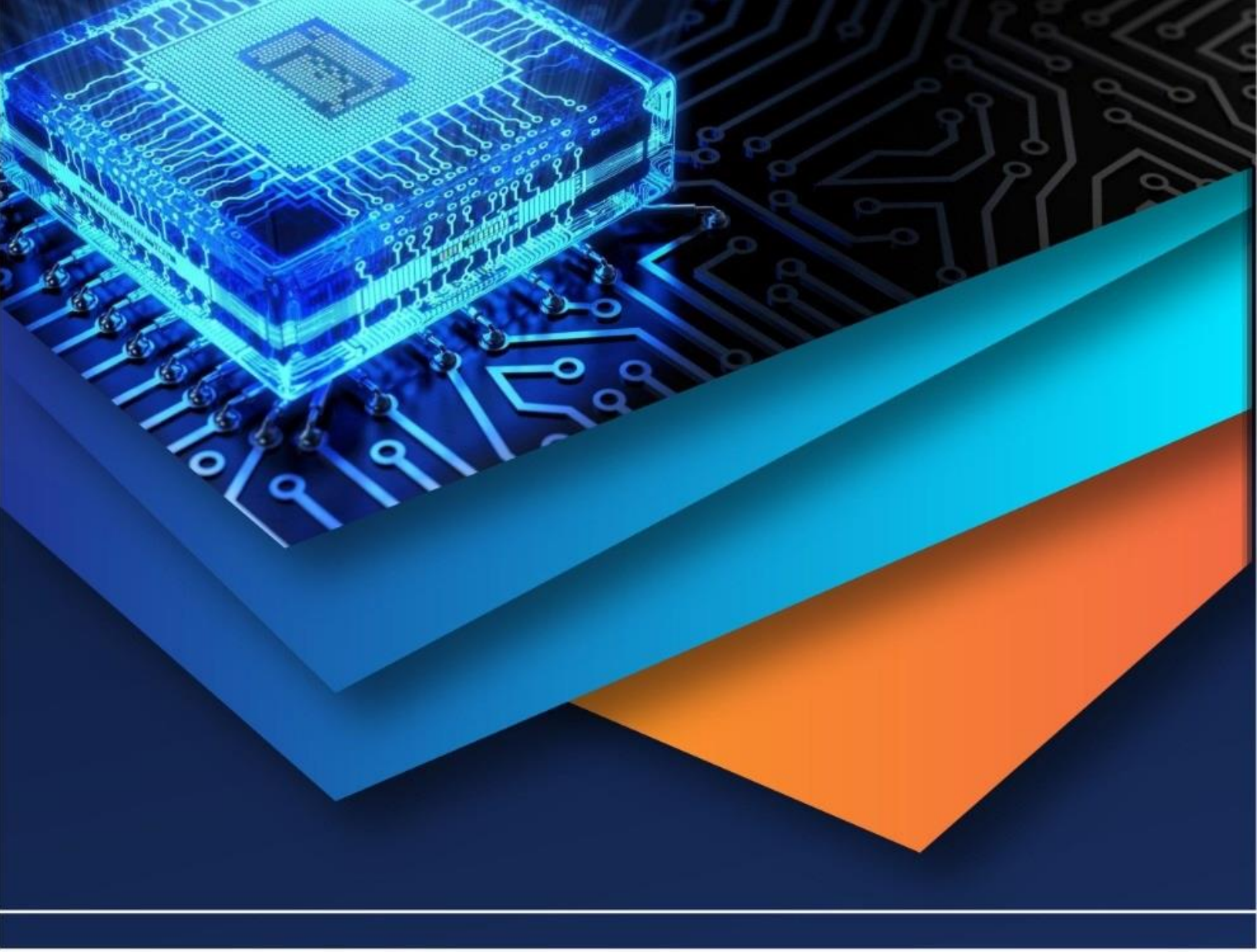


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