ABSTRACT

A fully robotic strategy for recognizing therapeutic plants using PC vision and artificial intelligence methods has been demonstrated. The leaves of 25 distinctive therapeutic plant species were collected and captured using an advanced cell in a research environment. Countless highlights have been separated from each sheet, for example length, width, border and area, number of vertices, shading, border and frame territory. Then some highlights determined by these properties have been elaborated. The best results were obtained by a CNN classifier that uses a 10 times cross approval strategy. With an accuracy of 98.3%, the CNN classifier performed better than any other AI approach, such as the nearest k- neighbor, Naïve Bayes, KNN and neural systems. These results are enriching and future work will be equipped to use a larger data set and elite processing offices to explore the exposure of deep learning neural systems to recognize restoration plants used in essential medicinal services. As far as we know, this work is the first of its kind that has created a unique image data set for therapeutic plants accessible on the island of Mauritius. It is expected that an electronic or portable PC framework for the programmed recognition of restoration plants will help the population of the neighborhood to improve their knowledge of therapeutic plants, to help taxonomists develop recognizable test methods for increasingly competent species.

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LIST OF ABBREVATIONS

CNN   CONVOLUTIONAL NEURAL NETWORK.

FCH   FUZZY LOCAL HISTOGRAM.

FLBP   FUZZY LOCAL BINARY PATTERN.

GLCM   GRAY LEVEL CO-OCCURENCE MATRIX.

PNN   PROBABLISTIC NEURAL NETWORK.

RGB   RED, GREEN, BLUE.

SVM   SUPPORT VECTOR MACHINE.

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW OF THE PROJECT

Plant ID has a significant job in current logical issues, for example, biodiversity, environment, and pharmacology among others. In Biology, plant distinguishing proof includes breaking down numerous organs, for example, blossoms, seeds, leaves and woody parts. This methodology renders the errand troublesome as blossoms and seeds, which are occasional and subject to the plant's age and condition, are difficult to discover. In exceptional circumstances, for example, discovering fossils or uncommon plants, the material accessible to distinguish a plant is only the leaves. To comprehend these circumstances, a leaf morphological scientific categorization method is proposed, which considers just the leaves to play out the distinguishing proof errands [14]. This methodology joins different highlights of leaves, for example, shape, vein structure, surface, and some histological data. Recognizing plants is a troublesome and complex undertaking because of the idea of the leaves. Although that the leaves present some major highlights, they additionally present a wide example of the variety. This variety may happen in various leaves from a similar plant, where attributes, for example, development and presentation to the sun produce varieties in the size, shading, surface, and state of the leaves. These varieties are additionally present in leaves from similar species, however from various plants. Right now, are an outcome of soil impact, atmosphere or even condition when the leaf is being shaped.

Plants have been utilized as medicines for thousands of years in different countries and are a source of many potent and powerful drugs worldwide, a total of more than 35,000 plant species are used for medicinal purposes. The value of medicinal plants to human livelihoods is essentially infinite. The World Health Organization estimated that 80% of the population of de-veloping countries relies on traditional medicines, mostly plant drugs, for their primary healthcare needs. Since time immemorial man has used various parts of plants in the treatment and prevention of many ailments. From prehistoric days, plants are used for shelter, food and medicine. The use of plants for medicinal purposes is as old as our

civilization. The first known written record of curative plants was of Sumerian herbal of 2200 BC. In the 5th century BC, The Greek doctor Hippocrates list out some 400 herbs in common use (Lakshmi V et al., 2006). Dioscorides, in the 1st century AD, wrote an herbal by using 600 plants which ultimately became the base for many later works. The World Health Organization estimated that 80% of the population of developing countries religon traditional medicines, mostly plant drugs, for their primary health care needs. Time immemorial man has used various parts of plants in the treatment and prevention of many ailments

The frames have grown so far using programmed order procedures, however the procedures are very comparative. These means include the configuration of the collected leaves, the realization of some previous managements to distinguish their particular characteristics, the arrangement of the leaves, the compilation of the database, the preparation for the recognition and evaluation of the results. The world has a more number of plant species, a significant amount of which have remedial qualities, close to elimination and others are destructive to humans. The recognition of dark plants depends very much on the intrinsic information of a specialized botanist. The best technique for distinguishing plants effectively and effectively is a manual processing strategy based on morphological qualities. In this way, a large number of procedures relating to the organization of these plant species "depend on the accumulation of information and the skills of individuals" [1].Be that as it may, this procedure of manual acknowledgment is regularly relentless and time consuming. Henceforth numerous scientists have directed examinations to help the programmed grouping of plants dependent on their physical qualities .

The frames have grown so far using programmed order procedures, however the procedures are very comparative. These means include the configuration of the collected leaves, the realization of some previous managements to distinguish their particular characteristics, the arrangement of the leaves, the compilation of the database, the preparation for the recognition and evaluation of the results. A computerized plant distinguishing proof framework can be utilized by non-botanical specialists to rapidly recognize plant species easily.

Normally customary individuals are doled out with the activity of gathering the plants from the timberlands. Once in a while they couldn't perceive the uncommon and significant plants due to human blunder. These uncommon sorts

of plants are critical to spare the life of a patient. Additionally, here and there these individuals could get off base species which might be hurtful plants. In such cases, it is important to utilize the programmed plant acknowledgment framework. This framework helps a conventional people or any layman to perceive the diverse plant species. These sorts of frameworks are likewise extremely accommodating for the trekking individuals if they are intrigued to gather the plant species while trekking the mountains.

EXISTING METHOD

This research proposed a new mobile application based on Android operating system for identifying Indonesian medicinal plant images based on texture and color features of digital leaf images. In the experiments we used 51 species of Indonesian medicinal plants and each species consists of 48 images, so the total images used in this research are 2,448 images. This research investigates effectiveness of the fusion between the Fuzzy Local Binary Pattern (FLBP) and the Fuzzy Color Histogram (FCH) in order to identify medicinal plants. The FLBP method is used for extracting leaf image texture. The FCH method is used for extracting leaf image color. The fusion of FLBP and FCH is done by using Product Decision Rules (PDR) method. This research used Probabilistic Neural Network (PNN) classifier for classifying medicinal plant species. The experimental results show that the fusion between FLBP and FCH can improve the average accuracy of medicinal plants identification. The accuracy of identification using fusion of FLBP and FCH is 74.51%. This application is very important to help people identifying and finding information about Indonesian medicinal plant. Historically all medicinal preparations were derived from plants, whether in the simple form of plant parts or in the more complex form of crude extracts, mixtures, etc. Today a substantial number of drugs are developed from plants (Fabricant and Farnsworth, 2001) which are active against a number of diseases. The majority of these involve the isolation of the active ingredients found in a particular medicinal plant and its subsequent modification. In the developed countries, 25 percent of the medical drugs are based on plants and their derivatives and the use of medicinal plants is well known among the indigenous people in rural areas of many developing countries

Disadvantages

- The most of existing methods has ignored the poor quality images like images with noise or poor brightness.
- Less accuracy

PROPOSED MEHOD

The proposed technique was tested on a dataset of 55 medicinal plants from Vietnam and a very high accuracy of 98.3% was obtained with a CNN classifier. The size of each image was 256*256 pixels. Proposed an approach based on fractal dimension features based on leaf shape and vein patterns for the recognition and classification plant leaves. Using a volumetric fractal dimension approach to generate a texture signature for a leaf and the GLCM (Gray level co occurance matrix) algorithm.

Advantages

- High accuracy is obtained and time consumption for detecting the shape.
- More datasets are included.

CHAPTER 2

LITERATURE SURVEY

Some tests have been performed to create tools for distinctive tests on plants in the past 10 years. Wu et al. They completed one of the most definitive works in the field of plant disposal. [2] From five fundamental geometric aspects, twelve morphological aspects are deduced and, therefore, the analysis of the main components (PCA) is used to reduce the measurement in order to send fewer sources of information to a probabilistic neural system (PNN). They achieved normal accuracy of 90.3% with the Flavia dataset, which is its creation. Using an alternative dataset but a similar classifier, Hossain et al [4] have achieved a degree of accuracy comparable to the comparative highlights [4].

However, using comparable evidence, an alternative dataset with only 20 species, Du et al [5] reached 93% with the closest k classifier [5]. Using another separation measure called "ISO map", we obtain 92.3% accuracy in a dataset of 2000 images containing 20 unique types of sheets [6]. Herdiyeniet et al. They used -9a combination of an example of an almost spongy couplet and a spongy shading histogram and a probabilistic neural system classifier (PNN) in a data set of 2448 leaf images (270 * 240 pixels) acquired from therapeutic plants in the forest Indonesia will achieve a grouping accuracy of 74.5% [7]. Prasvita et al [7] have created a versatile comparative application that depends on previous research [8]. Using the parts descriptor (KDES) as another component extraction strategy, Le et al [9] built a recognizable test framework for a fully mechanized implant. The proposed procedure was tested on a dataset of 55 therapeutic plants in Vietnam and a high accuracy of 98.3% was achieved with the help vector machine classifier (SVM). In addition, its calculation achieved 98.5% accuracy in the Flavia dataset, which is the best result distributed so far in this dataset. Using discrete wavelet modification to eliminate the interpretation of invariant reflections from a variety of 8 distinctive elaborate plants in Indonesia, Arai et al [10] achieved 95.8% accuracy using a classifier of help vector machines (SVM) [10].

The size of each image was 256 * 256 pixels. Du et al [11] proposed a methodology that depends on the measurement of the fractal highlighted on the basis of the shape of the leaf and the designs of the veins for the recognition and order of the leaves of the plant [11]. Using a closer k classifier with 20 highlights,

CHAPTER 3

METHODLOGY

AIM OF THE PROJECT

The main aim of this project is to automatically recognize the medicinal plants. Using the base features which are extracted directly from the image, a number of derived features are calculated. Ratios are more suitable for comparison as they are independent of the actual size of the image in pixels.

SYSTEM REQUIREMENTS

Software Requirements

- ➢ Operating System   :WINDOWS 7,8,10
- ➢ Software   : PYTHON 3.7
- ➢ Simulation Tool   :OPENCV PYTHON

Hardware Requirements

- ➢ CPU type   :Intel Pentium 4
- ➢ Clock speed   :3.0 GHz
- ➢ Ram size   :512 MB
- ➢ CD -drive type   :52xmax

OVERVIEW OF THE PLATFORM

Python

Python is a widely used general-purpose, high level programming language. It was initially designed by Guido van Rossum in 1991 and developed by Python Software Foundation. It was mainly developed for emphasis on code readability, and its syntax allows programmers to express concepts in fewer lines of code.

Python is a programming language that lets you work quickly and integrate systems more efficiently.

It is used for:

- web development (server-side),
- software development,