

Plant Leaf Identification Using Shape Features

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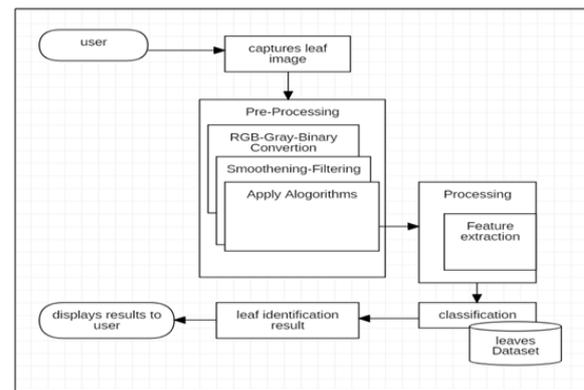
Abstract-Automated systems for plant identification can be used to classify plants into appropriate taxonomies. Such information can be useful for botanists, industrialists, food engineers, resource persons and physicians. The plants are identified by using the images of their leaves. A web application is also developed to allow a user to take pictures of leaves and upload them to a server. The server runs pre-processing and feature extraction techniques on the image before a pattern matcher compares the information from this image with the ones in the database in order to get potential matches. The different features that are extracted are, the length and width of the leaf, the area of the leaf, the perimeter of the leaf, the framework of area, the structure perimeter, a distance map along the vertical and horizontal axes. SVM classifier is implemented and tested on 1000 leaves belonging to different species of plants.

I. INTRODUCTION

Plant classification based on leaf identification is becoming a popular trend. Each leaf carries substantial information that can be used to identify and classify the origin or the type of plant. In medical perspective, images have been used by doctors to diagnose diseases and this method has been proven reliable for years. Using the same method as doctors, researchers try to simulate the same principle to identify a plant using high resolution leaf images and complex mathematical formulae for computers to decide the origin and type of plants. The experiments have yielded many success stories in the lab, but some approaches have failed miserably when tested in the real world. This happens because researchers may have ignored the facts that the real world sampling may not have the luxury and complacency as what they may have in the lab. What this system intends to deliver is the ideal case approach in plant classification and recognition that not only applicable in the real world.

II. PROPOSED METHODOLOGY

The trees are basically identified by their leaves. There are different varieties of trees grown throughout the world. Some are important cash crop. Some are used in medicine. The tree identification is very important in day to day life. Their identifications had been studied using various laboratory methods. The main objective is to identify plants through plant leaves on the basis of their shape, features using digital image processing techniques.



The Architectural design is as shown in the above figure. The Architecture design represents mainly flow of requests from the user to data base. In this Architectural design user captures leaf image ,then performe pre-processing techniques such as RGB-Gray-Binary conversion. After this conversion process apply image smoothing and filtering then apply algorithms. Processing the feature extraction ,classify the leaf based on feature. Then identify the leaf based on classification result. Finally display result to user.

III. TECHNIQUES USED

A series of image processing techniques are used for preprocessing the image

- Rotation: The image is rotated to proper orientation if required by rotating the image clockwise if its width is greater than its height.
- Greyscaling : The image is converted into greyscale since this part of the system needs shape information and not colour information.
- Thresholding : A Thresholding operation is performed using OTSU's thresholding method to obtain binary image.

IV. BENIFITS

Compared to earlier approaches our system provides comparable accuracies and is expected to produce results much faster.

Leaf recognition system can contribute strongly in the science of plant classification.

Leaf recognition system make up for the deficiency in people's identification abilities.

V. LITERATURE SURVEY

1. Need For research

Automated systems for plant recognition can be used to classify plants into appropriate taxonomies. Such information can be useful for botanists, industrialists, food engineers and physicians. In this work, a recognition system capable of identifying plants by using the images of their leaves has been developed. Therefore a proper research is essential to efficiently identify plant leaf using shape features.

2. Existing System

Many methodologies have been proposed to analyze plant leaves in an automated fashion. A large percentage of such works utilize shape recognition techniques to model and represent the contour shapes of leaves, however additionally, color and texture of leaves have also been taken into consideration to improve recognition accuracies. One of the earliest works employs geometrical parameters like area, perimeter, maximum length, maximum width, elongation to differentiate between four types of rice grains. Lots of researchers have proposed many methods for finding out the area of the leaf in an image. Out of these my work uses a simple and a robust area calculation by using another object as reference.

3 Proposed System

The present system proposes a scheme for automated detection of plant category by analyzing shapes obtained from a collection of their leaf images, using image processing techniques. It does not consider colour and texture of leaf for plant identification. This system makes a simple approach by just considering leaf shape details for image classification without many complications

VI. CONCLUSION

Plant leaf recognition is useful to identify the plant type. The methods are used to extract plant leaf features are based on shape .To identify different plant leaf images based on its surface parameter is challenging and most expensive task. Feature extracted from shape is used to identify plant type and gives better result. After the collection of database the features are to be extracted by using appropriate technique. Then the test samples are taken and compared with the database to identify the closest match. The identified leaf is to be categorized.

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