Mobile Content-Based Leaf Image Retrieval System

Dr. N. Shanmugapriya
Assistant Professor
Department of Computer Science, Nandha Arts and Science College,Erode

Abstract : This exhibit introduces a content-based leaf image recovery framework that supports wired/remote access. For instance, on the off chance that we need to think about a plant that we experience in a mountain or field, we may find it in a represented book. Be that as it may, it will set aside a long opportunity to look because of the absence of appropriate indexing or search clues and enormous amounts of same plants. With the end goal to take care of this issue, we built up a content-based leaf image retrieval system considered mCLOVER that supports both wired and remote access and incorporates an arrangement of novel features for simple questioning and efficient retrieval.

IndexTerms **– Content-based Image Retrieval, Query by Sketch, Query by Photograph, Mobile Platform**

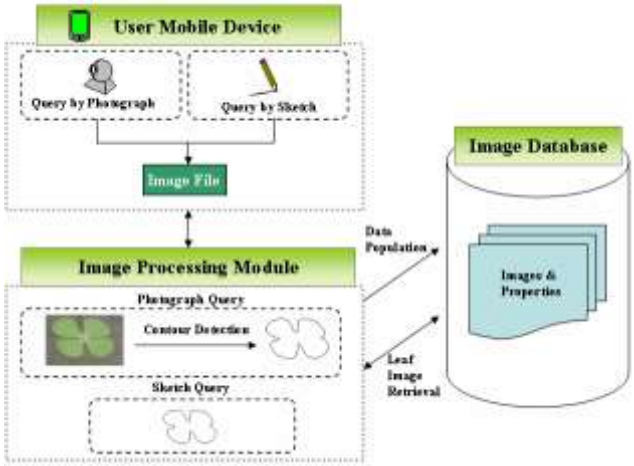
I. Introduction

Many content-based image retrieval frameworks have been produced to recover similar images from database. Remote access to such recovery framework has numerous applications. For instance, in the event that we need to recognize a plant or tree on our field trip, we may get to the framework and inquiry utilizing some helpful cell phones. In any case, on the off chance that we don't have a suitable question interface, looking will be excruciating considering constrained limited wireless connection bandwidth and mobile device capacity

In this exhibition, we present a mobile content-based leaf image retrieval framework, mCLOVER which empowers clients to recover leaf images by outlining or capturing. This framework additionally supports the development of image database utilizing outlined image and photos on the field.

II. System Architecture

Figure 1 outlines the general structure of mCLOVER. As appeared in Figure 1, a user can photo or portray a leaf that s/he needs to recognize utilizing a cell phone. At that point, the photo or portrayed picture is exchanged to the picture preparing module, where attributes of outlined picture or photo picture are separated and investigated. Finally, those features are utilized to recover target pictures from the picture database. In the event that the client is a botanical master, he may record the inquiry picture and additional botanical data in the picture database for further utilization.



III. SYSTEM IMPLEMENTATION

In this chapter, we present several implementation issues of the *m*CLOVER.

3.1 Contour Detection

mCLOVER supports a many questioning modes. One of them is the query-by-sketch, where contour sketch of leaf by client is sufficient for questioning. In the qquery-by-photograph mode, photographed pictures are utilized for questioning. In

particular, leaf contours aside from veins are extricated consequently and utilized for questioning as in the query-by-sketch. To help this, some extra handling ought to be performed for the photographed pictures.

Initial, a photo picture is changed over to its grayscale picture for the arrangement for boundary tracing. At that point, little objects below some threshold pixels are evacuated. From that point forward, grayscale picture is morphologically shut as a solitary object. Here, any gaps in the picture are filled to assess the region encased by the boundaries. At long last, its form is removed by an edge detection method.

By this conversion process, photograph is transformed to the contour detected grayscale image. Later, this image is used to retrieve leaf images in image database.

3.2 Image Retrieval by Shape

In the same way as other content-based image retrieval techniques [3, 4], mCLOVER utilizes shape-based image retrieval strategy. Since leaves have comparative color or texture, shape-based image retrieval is more successful than different strategies.

Image retrieval process comprises of three stages: edge detection, shape representation and shape matching. In the edge detection step, Canny Edge Detection [1] strategy is utilized to remove edges of outlined image. If there should be an occurrence of photo image, no further preparing is required. Rather, the changed over image is utilized for client's photo. In the shape representation step, we represent to the state of the leaf image so that it is invariant to interpretation, pivot, scale, and survey point change. Since utilizing each point along the contour isn't cost-effective, we attempt to limit the quantity of form focuses utilized for recovery. Particularly, in our mCLOVER, we enhanced MPP (Minimum Perimeter Polygons) for shape representation. MPP is a polygonal approximation strategy for recognizing curvature descriptions, yet it just uses outside boundary of the segment of cells. Anyway MPP sets aside a long opportunity to recover images because of numerous superfluous focuses. In this manner, we consolidated focuses along limit if the point surpasses some threshold. Subsequent to separating purposes of enthusiasm by utilizing enhanced MPP, shape coordinating procedure ascertains the likeness between query object and image object in the database. Comparability between two objects is assessed by the Euclidean distance between each object's points.

3.3 Database Construction

To enrol new images into the database, a botanical expert can essentially convey his(her) individual cell phone to the plant natural surroundings, sketch the leaf(take an image) to get its MPP-related properties, and after that store them into the image database. In any case, contingent upon the client's sketch aptitude, a leaf picture may be put away as another one despite the fact that it is as of now in the database. Therefore, our framework enables a plant's property to be put away with its image. For capacity, outline or photo is moved into the images handling module. If there should arise an occurrence of photo, it experiences the form location process. From that point onward, intrigue purposes of images in the images handling module are figured by the leaf image recovery process. At that point its original image, attributes and extra information are exchanged to the images database.

IV. Demo and Conclusion

For the demo, we executed a model framework on a HP iPAQ 4700 with 320*240 displays and PocketPC 2002 working framework, utilizing Microsoft .Net Compact Framework [2]. As appeared in Figure 2, clients can draw a leaf image specifically on the PDA screen or photo utilizing a camera on the PDA. At that point, the image is exchanged to the image preparing module through remote system. In the event that the input is a photo, client can check the changed over image on the screen. From that point onward, our framework restores the query items dependent on our similitude positioning capacity. In this exhibition, we have introduced a content-based leaf image retrieval framework over mobile stage. It is a helpful, simple and straightforward framework for plant's property recovery and capacity. The primary commitment of our work is that we thin the data hole by actualizing content-based image recovery framework over portable stage. At the point when clients look plant without adequate plant's properties in the field, current frameworks can't return agreeable output to the clients. In our framework, clients can successfully seek plant properties without delineated books or explanation data, yet by simply sketching or photographing.

Also, database storage process moved toward becoming to be basic. In contrast to numerous different frameworks, clients can store plant properties by sketch in the field. Likewise, draw can be one-sided by client's skill. Subsequently, we included a strengthening capacity that clients can store plant properties by photographing.

(a) Sketch Query

(b) Image Query

(c) Query Result

Figure 2: Query Interface

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