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**BANGLADESH UNIVERSITY OF
BUSINESS AND TECHNOLOGY**

Lab Assignment (optional)

Course Code: CSE 342

Course Title: Computer Graphics Lab

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Two questions related to computer graphics syllabus from mid syllabus

Question 1: Can you imagine our day to day life without Computer Graphics? Give proper explanation.

Question 2: Is it possible to use the midpoint circle algorithm in research?

Q1 Solution

In my opinion we can't imagine our day to day life without computer graphics. One of the most exciting and rapidly growing field is Computer Graphics. It has become a powerful tool for the rapid and economical production of pictures. Old Chinese saying "One picture is worth of thousand words" can be modified in this computer era into "One picture is worth of many kilobytes of data".

It is natural to expect that graphical communication will often be more convenient when computers are utilized for this purpose. This is true because one must represent objects in two-dimensional and three-dimensional spaces. Computer Graphics has revolutionized almost every computer-based application in science and technology. As time is money, in the 21st century people doesn't have the time to read huge number of pages. So this problem is solved by Computer Graphics. Picture can represent a huge database like bar charts, pie charts etc. Computer Graphics methods are utilized in Computer Aided Design (CAD) to produce the drawings of certain parts of a machine from any viewing angle. Many people for different domain of applications use interactive graphics. For example, structural engineering use for efficient design of structures on the basis of the analysis of stress in various elements of the structure. From the survey it is evident that in future, engineers, designers etc, will be using computer graphics quite extensively. The development of computer graphics has made possible virtual reality, a synthetic reality that exists only inside a computer. Virtual reality is fast becoming an indispensable tool in education. Computer graphics has also expanded the boundaries of art and entertainment. In our day to day life we all watch movies. A lot of movies use computer graphics as per their need. Movies such as *Jurassic Park* make extensive use of computer graphics to create images that test the bounds of imagination.

There is virtually no area in which graphical displays cannot be used to some advantage, and so it is not surprising to find the use of computer graphics so widespread. Today, we find Computer Graphics used routinely in such diverse areas such as science, engineering, medicine, business, industry, government, art, entertainment, advertising, education, training, etc.

So, it's impossible to image our day to day life without computer graphics.

Q2 Solution

We know that in computer graphics the midpoint circle algorithm is an algorithm used to determine the points needed for rasterizing a circle.

Yes, it is possible to use the midpoint circle algorithms in research. Midpoint circle algorithm already used in different research works. One of them is **Plant Leaf Image Detection Method Using a Midpoint Circle Algorithm** [1].

In the past, shape research has been driven mainly by object recognition. As a result, techniques of shape representation and description mostly target particular applications such as leaf classification. In this paper there is a proposed model using midpoint circle algorithm.

The Proposed Circle-based Radii Model (CBRM):

A new Circle-based Radii Model is now proposed for shape descriptor. A circle is formed by using a midpoint circle algorithm based on the center point of the leaf, as discussed earlier under that heading. Here, the radius is 0.5, after forming the circle; the proposed method uses two phases to obtain four feature points on the circle of a leaf image in the two-dimensional plane.

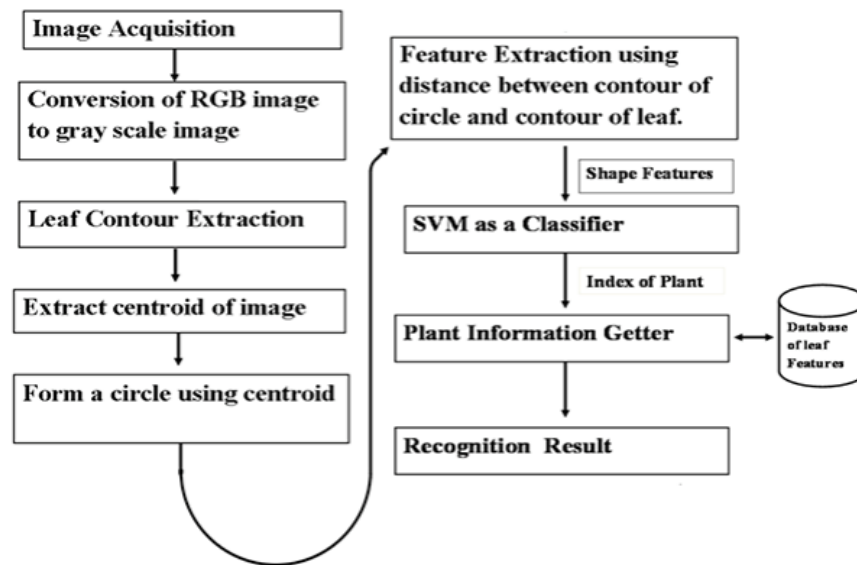


Figure: Architecture for leaf recognition system

In the conventional method, the centroid radii model, the lengths of the radii from the centroid to the boundary are used to represent the shape, and the angular interval between radii is fixed. This conventional radii model generates a vector that is the normalized length of radii for shape representation. The vector depends on the order of the radius.

By using the proposed method, the plant has been identified successfully in a large number of classes. The proposed method upgrades the set of feature values. The experimental results indicate that the proposed method shows significant improvement in terms of the increased number of features, and enhances the feature value. Accuracy of proposed circle-based radii model for the shape descriptor is 93.33% (the centroid radii model achieves 85.92% accuracy), indicating that the circle-based radii model is more suitable for a plant leaf classification system given its high retrieval performance.

References

- [1] V. M. B. Vijaya Lakshmi, "Plant Leaf Image Detection Method Using a," *Journal of Modern Applied Statistical Methods*, Vols. Vol. 16, No. 1, no. 2017, pp. 461-480, May 2017.