

AUTOMATED SHAPE DETECTION AND RECOGNITION SYSTEM

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ABSTRACT

Anything that can be automatically done for you can be automatically done to you. This project is an automated shape detection and recognition system of regular shapes such as circles, squares and rectangles from an input 2D colored image coupled with the development of a blood cell counting system as an application. The technique used for the detection and recognition of the shapes as well as the cells is the Blob Analysis (Binary Large Object) which combines several image processing techniques such as image pre-processing, segmentation, binary feature extraction and finally recognition/classification/counting.

The programming environment for this project is MATLAB 7.6. There are 3 GUIs for this with the initial being the 'Home Page' where the user chooses which of the 2 system operations will be performed that is either shape detection or recognition or cell counting. The second is the 'Shape Detection and Recognition' where an image containing the 2D shapes is loaded and the system performs the various image analysis techniques and produced the output image with the required result. Finally the third is the 'Cell Counting' where the cells from an input 2D image undergo various image analysis techniques to count the exact number of cells present in the image.

The system design criteria were met and it is backed up by the output obtained during several tests that were carried out. It is accurate for detecting and recognizing 2D shapes images as well as blood cells only and this fact is one of the limitations of this project. It can be further improved or enhanced to detect 3D shapes with the use of emerging technology known as Vectoral-Imaging and also advance morphology features for the cell counting.

Keywords: Blob Analysis, segmentation, shape recognition, shape detection, cell counting, vectored-imaging, advance morphology, MATLAB