ISTANBUL TECHNICAL UNIVERSITY
FACULTY OF SCIENCE AND LETTERS
MATHEMATICAL ENGINEERING DEPARTMENT

MAT 116E ADVANCED SCIENTIFIC AND ENGINEERING COMPUTING

TERM PROJECT REPORT

SUBJECT: Detecting Circles and Rectangles in MATLAB

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I. Introduction

The aim of this project is to be able to identify rectangles and circles in an image. There are several methods for this in the literature. A common method is using Hough transform to detect geometric objects in a digital image but I used a much simpler way

II. The method I use

For any object that has a closed curve in a digital image, it is easy to calculate the geometrical center of the object. Hence conveniently find its width and length, circularity, area, diagonal line length, etc. If the closed curve is really a rectangle, these values must satisfy specific equations, and these equations can be used to detect rectangles. Similarly, we can use circularity to determine whether the object is a circle or not.

I specifically used this method to determine rectangles

III. Summary

As a result, we were able to find rectangles and circles with the features of the MATLAB image processing tool and a simple algorithm. Of course, this method also has some disadvantages. The success rate is not as high as the Hough transform method. In addition, errors can occur due to many factors like noise and missing data but less computational cost is the advantage of this method.