

CHAPTER III

RESEARCH AND METHODOLOGY

In the creation of this project, will use the waterfall method. Waterfall method provides a work flow approach software life sequentially starting from the analysis, design, coding, testing and support phase (Rosa and Shalahuddin, 2011). This method consists of the following steps:

1. Literature Study

The first step to working on this project is to find and study the reference sources that can support the completion of the project and the required algorithms. In this project, will use the Sobel method to detect the edges of object and the rotation and translation mathematical formula to move and rotate the triangle object at the image.

2. Design

After studying algorithms and reference sources are needed, then design the outline design for the project which will be carried out. Firstly, input the triangle image that will be tested. Secondly, the image will be through preprocessing steps where it will be transformed into the gray scale image and smoothing the image to decrease the noise. Then through the threshold process to change the image into a binary image. The purpose of smoothing is done before will be useful at the time detect the edges in the next step using Sobel methods so no noised detected as the edges anyway. After the edges of object are detected then thinning the edges of image so the image just have one pixel thickness of the edges.

After all of preprocessing is done, rotate the triangle object of image with a certain angle. Then calculate the length of base of each triangle that will be tested and reference image. According that, the program determine the percentage value of similarity of two triangle image. The final output of

this system is the highest percentage value of similarity of two triangle image and user also can see the percentage value of similarity between triangle image that will be tested and all of reference triangle image in database. On this project using Java Graphic User Interface as display output in order to allow a user in its use.

3. Implementation and Experiment

Furthermore, after studying algorithms and various references as well as the finished design, implemented this project with the Java programming language. After this project is complete implemented, then conducted an experiment in functional systems. In this project will use some digital image that contains the triangle object with different position to find errors that may occur.

