

# CHAPTER I

## INTRODUCTION

### 1.1 Background

Technology continues to grow from year to year so that humans continue to create devices that can help their lives. The development of technology also increases people's demands for high quality products, especially those produced by industry. This affects industry players to develop an automatic system. By using an automatic system, the resulting product can be better, done in a faster time, and produced more products when compared to manual workmanship. Thus the application of automation technology can also increase productivity and work efficiency.

Styrofoam is a material from plastic process which is widely used by the public. Styrofoam is often used as a food container, protecting electronic devices and decoration. Styrofoam is widely used because of its properties that are lightweight, strong, and easily formed. To form Styrofoam into the desired shape people usually use hot wire. The hot wire gets heated by electricity so that it can be used as a cutter of Styrofoam. At the moment in the market, there are many devices that have been sold to cut Styrofoam using hot wire. Its functionality is still in manual way. The user needs to move that device to certain direction to produce desired shape.

Manual workmanship certainly has deficiencies. One of them is the process cannot be repeated so it only can be done in one process only. In order to make this process repeatable, certain technology can be applied to Styrofoam wire cutter. One of technology which can be applied is using a robotic arm. By using a robotic arm, the movements in the human hands can be manipulated by robotic arm and used to cut Styrofoam into the desired shape. This automatic robot arm must have controller to keep cutting process automatically. By using this controller, the position of the robot arm can be memorized and restarted so that the cutting process can be done repeatedly. So, basically this study will change manual workmanship of cutting Styrofoam by hot wire into automatic system that will make cutting process repeatable.

## **1.2 Aims**

The aim of this present study is to realize 5 DOF robot arms Styrofoam cutters with arduino controller. To achieve that aim, several objectives have been defined as follows:

1. Designing a 5 DOF robot arm Styrofoam cutter with arduino controller.
2. Creating robot arm styrofoam cutter that can repeat cutting process.
3. Testing the robot arm system that has been made.
4. Analyzing the errors that occur in the repeated cutting process.

## **1.3 Benefits**

By making this Styrofoam cutting robot arm, it is expected to have the benefits such as:

1. The cutting process can be done repeatedly.
2. Increase the productivity of the Styrofoam cutting process.

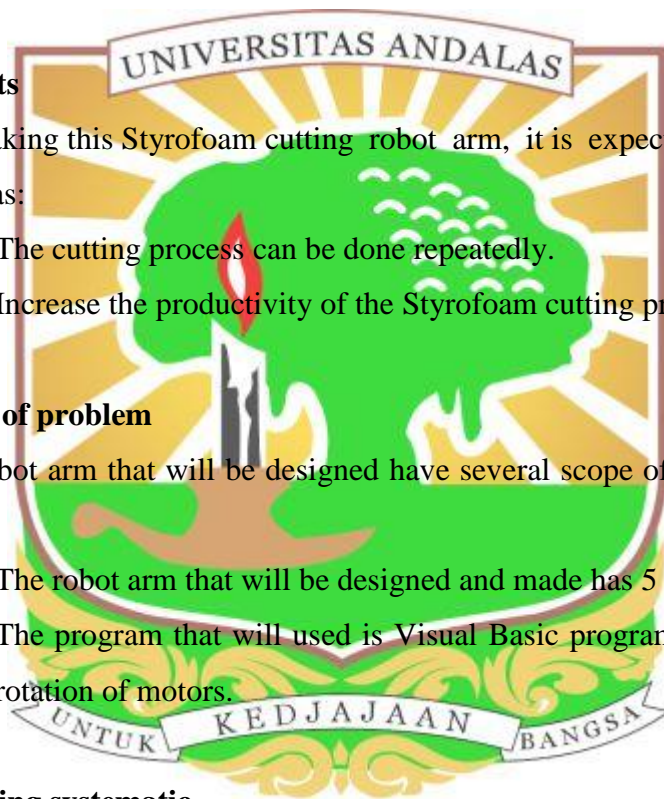
## **1.4 Scope of problem**

The robot arm that will be designed have several scope of problems, they are:

1. The robot arm that will be designed and made has 5 DOF
2. The program that will used is Visual Basic program. It can control rotation of motors.

## **1.5 Writing systematic**

1. Chapter I is an introduction that contains the background of the making of the robot arm, the purpose, benefits, limitations of the problem and the systematic writing.
2. Chapter II contains a literature review containing supporting theories relating to the making of a robot arm.
3. Chapter III is a methodology which contains the process of making a tool, whether it is making parts of a robotic arm and programming process.



4. Chapter IV is the results and discussion of the performance of the equipment that has been assembled to produce the desired shape of styrofoam pieces.
5. Chapter V is the conclusions obtained from the series and tool analysis in this final project, as well as suggestions that can be used to improve this final project.



