

CHAPTER 1

INTRODUCTION

This chapter is mainly focus on discussing about the background of study, problem statement, and objectives of the project and also the scope of project to be done.

1.1 BACKGROUND OF STUDY

Headlamp is a lamp which is attached to the front of automobile. The function of headlamp is used to flash up and create a better view at night for someone who drives the car on the road. Nowadays, many vehicles are using two light bulbs in a headlamp. One is create a low beam light and the other one is create a long beam light. Short beam light is a short distance light can reach and suitable for driver drives a car on the road at night. While long beam light is a light can flash up a very far distance and have a better view at night when drives a car alone on the road.

In this project, I will design a headlamp alignment system and fabrication of the headlamp model for automobile by using microcontroller. The microcontroller used to build this project is Arduino Mega. Arduino Mega is used to integrate the hardware and software parts to the headlamp model. The push button, ultrasonic sensor, potentiometer used as input device. While the servo motor and light bulb used as output device.

The purpose of this project is to fabricate a headlamp model by using a light bulb and moving by servo motor to create a better view when driving a car at night.

1.2 PROBLEM STATEMENT

Nowadays, many drivers are still using manual light switching to turn on or turn off the headlamp. Some of the drivers turn on the high beam light at night and forgot to turn into low beam light. This will make the driver in front of the car or on opposite of the car feel uncomfortable due to light too bright and cause the driver cannot see the view in front of the road clearly. This may cause the road traffic accident. While some of the drivers forget to turn on the light when the weather become darkness. This careless also may cause accident occurs because other driver may cannot see the car in the darkness without turn on the headlamp.

1.3 OBJECTIVE

- To design a headlamp system for automobile that can turn angle of headlamp to have a better vision.
- To fabricate a headlamp model that can control with microcontroller Arduino Mega.
- To make a choosing mode for driver to choose auto-mode or manual mode.

1.4 SCOPE OF PROJECT

There had some limitation such as the maximum sense distance for ultrasonic is about 4m. This sensing distance for ultrasonic cannot be use on the road. Other limitation is ultrasonic cannot use to detect that object in front is car or vehicle. Therefore, anything object in front of ultrasonic sensor then the servo motor will moves downward and the light of headlamp will turn low beam. The environment also will effects the accuracy of ultrasonic sensing range such as temperature will change the value speed of sound so the time range also will be affected for the sound wave to deflect back to the receiver.

Besides, the hardware design now no marketing value because this hardware haven fully design yet and just a prototype but the concept is same and can be used in real life. The LDR sensor also I just assume work in dark surrounding but no consider the street lamp on the road.

Last but not least, this prototype only can be used in three lane highway. If drives on the rural place then the headlamp will always keep downward and low beam because the three ultrasonic is used to sense the distance in front of three lane highway. That is why the manual mode operation still needs it like this situation. In addition, manual mode operation is important in safety purpose if some of sensor was malfunction and turn off the light of headlamp. This time driver can use this manual mode operation to continue drives car.

1.5 THESIS OUTLINE

This thesis consists of five chapters which are start from Chapter 1 Introduction, Chapter 2 Literature review, Chapter 3 Methodology, Chapter 4 Results and Discussion and Chapter 5 Conclusion and Recommendations.

Chapter 1 is mainly focus on discussing about the background of study, problem statement, and objectives of the project and also the scope of project to be done.

Chapter 2 discuss about the journals article that involve in this project. Those journals article will enable us to understand the later discussion on this project.

Chapter 3 mainly discuss about the method used in this project. This project divide into hardware and software based. There are three major parts involved in this project which is simulate the circuit design with Proteus software, design a headlamp model, and interface between the hardware and Arduino. The details of the progress in those this project will be explained in this chapter.