

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 BACKGROUND**

Gates are commonly used nowadays at residential area. A gate is a point of entry to a space enclosed by walls, or an opening in a fence. Gates may prevent or control entry or exit, or they may be merely decorative. Today many gate doors are opened by an automated gate operator. Those gates come with many special features. The need for automatic gates has been on the increase in recent times. The system described here incorporates the use of actuator to control the movement of the gate automatically. The automatic gate described here automates the entrances to parking lots of residential homes, organizations, automobile terminus, and public car parks. It uses a remote control convenience to avoid the stress of manually opening and closing the gate. The technology used eliminates gate monitoring and manning by human beings. The gates have to perform gyrations by open, auto reverse, stop, fully close and fully stop. It provides convenient access and intelligent features that makes it distinct from all other gates which bring it so close to a security device. Those gates come with different type of mechanism such as sliding, swing, folding, and barrier gate. Those mechanisms have their own working principle and feature but, automatic gate design seem limited at the local market. Most of the product is imported from outsider supplier. The price of the product also seems expensive. Cost study and new mechanism design, can be marketable toward wider customer at lower cost and new innovation of auto gate mechanism can enhance local design capability.

## **1.2 PROBLEM STATEMENT**

Nowadays, the automatic gate mechanisms have been improved and developed with different kind of features. These features have increased the product cost and this cost does not include the installation cost. Many people especially with low income could not afford to purchase the gate mechanism. The gate mechanism needs a very skillful or trained person to install the mechanism to the gate. Some gate mechanisms also need to be attached with rail on the ground, this seems to be inconvenience and need a lot of work force to install the track. Development of automatic gate mechanism should help in term of cost reduction and ease of installation.

## **1.3 OBJECTIVES**

Objectives for this project refer to the mission, purpose, or standard that can be reasonably achieved within the expected timeframe and with the available resources. The objective of this project is to design an automatic gate mechanism for residential home with double gate leaf with weight of 100 kg for each side of the gate. Cost reduction and ease of installation are also considered for this mechanism.

## **1.4 PROJECT SCOPES**

The scopes for this project are to study about several types of automatic gate mechanism and to understand the working principle in term of movement. Those mechanisms include swing gate type mechanism, sliding gate type mechanism and folding swing type mechanism. Design and sketches in rough view, are compared between those designs and the best is chosen. The design should consider about the portability and cost. Based on the design, a prototype is constructed for mechanism rough view. Finite element analysis using ALGOR software is to determine the critical failure part of the mechanism. This is to ensure the mechanism can withstand high torque.

## **1.5 EXPECTED OUTCOME**

Designed and fabrication of automatic gate mechanism should be reliable, easy to maintain, safe to operate and less in cost compared to other types of automatic gates. The automatic gate mechanism should also be able to function properly when installed on normal gate with weight of 100kg.

## **1.6 LIMITATION**

The limitation for this project is hard to collect data about the automatic gate mechanism. Automatic gate are normally for commercial purpose and it is impossible for the product company to expose their own design and working principle of the product.