CHAPTER I

INTRODUCTION

1.1 OVERVIEW

Security lights are one of the most practical and effective way to prevent crimes around the house. Even though a well-lighted property neither can prevent malicious activity nor guarantee personal safety, however it is a fact that crimes are less likely to occur because lighting is an excellent deterrent. Security lights expose the criminal thus, making them feel insecure and vulnerable. Even if the homeowners did not realize of an unwanted visitor, the presence of lights might alert neighbors, watch guard or police patrols of the situation.

Nowadays, the light-based security system can be buy from store have some weaknesses. One of the weakness is the bulb used is of a very high intensity light bulb. The problem is the light can produce a very large shadow. Especially, if the garden is full of trees and other objects. The large shadow can limit the vision within the garden. Moreover, the security lights need to be controlled manually.

Therefore, in this project, instead of using high intensity lights bulb, garden lights bulb will be used. Garden lights bulb is chosen because it gives better vision around the vicinity. The system is also design to be on and off automatically. To control the system, microcontroller MC68HC11A1 is use so that the system will be able to run automatically.
Other hardware that will be used is the light sensor, infra-red sensor, digital clock and also interfaces circuit.

The sensors that are use give the system the ability to detect the condition around the vicinity. Light sensors enable the system to differentiate between day and night. By the end of the day garden lights will on. The digital clock are used to replace timer. Its function is to enable the system to know the time. In this project, the garden lighting will activate by dusk. The activation of the garden lights will continue until the time set in the digital clock alarm system. When the digital clock alarm is on, it will deactivate the whole garden lights. However, after this deactivation, the infra-red sensor will take over. Infra-red sensor, are used to acts as a motion sensor. If the sensor detects any movement the garden lighting will be activated to scare off the intruder. Therefore, the system does act in a dual-function system, both as the security system and also as the garden lighting system.

1.2 OBJECTIVE

The overall aim of this project is to build an autonomous lighting and security system that saves energy and more efficient, the design system will have the dual-functionality on both the security and the garden lighting system in the vicinity. Moreover, the job scope is not limited to just turning ‘on’ and ‘off’ the main power supply but it extends to these works:

1. To build a light sensor circuit that is able to activate at a preset darkness. The light sensor is able to adjust its level of sensitivity.
2. To build an infra-red sensor circuit that act as a motion sensor.
3. Both circuits of the light sensors and infra-red sensors will be built independently before interfacing them with the microcontroller.
4. To build digital with an alarm function and able to energize a relay to the interfacing circuit. The clock use an AC power supply.

5. To build an interface circuit that is able to receive input from the microcontroller and able to both activate and de-activate the main power supply.

6. To build a microcontroller MC68HC11A1 circuit as the main controller of the system. The microcontroller is in the bootstrap mode.

1.3 THESIS STRUCTURE

The thesis consist of five chapters all together including this chapter. The contents of each chapter are outlined as follows:

**Chapter 1** briefly explains about the overview of the project, its objective and also the scopes. Finally, the thesis structure is explained.

**Chapter 2** discusses the detail of literature review, that are applied in the whole project. These literature review, are selected from books, journals and articles.

**Chapter 3** explains the methodology and the system hardware. This chapter is divided into two parts. The first part explains the building the hardware and the second part interfacing the hardware with the microcontroller. This part also explain how the microcontroller is programmed in bootstrap mode.

**Chapter 4** discuss the testing set-up and the result of interfacing the hardware with the microcontroller. The chapter focus, on the hardware testing.

**Chapter 5** is the conclusion in finishing this project. This chapter also include suggestion for future development. Cost and commercialization also discuss in this chapter.