Universiti Teknologi MARA

Fire Alarm and Detection System Using Arduino Uno

Aruen Anak Manggau

**Thesis submitted in fulfillment of the
requirements for Bachelor of Computer Science
(Hons) Data Communication and Networking
Faculty of Computer and Mathematical Sciences**

January 2019

ACKNOWLEDGEMENT

Praises and thanks to God because of His Almighty and His utmost blessings, I was able to finish this research within the time duration given. Firstly, my special thanks go to my supervisor, Dr. Siti Arpah binti Ahmad and my CSP650 lecturer, Assoc. Prof. Dr. Kamularifin Abdul Jalil for the ideas, guidance, patience, constructive criticism throughout the process in completion of this thesis.

Special appreciation also goes to my beloved parents and whole family because of their understanding and support and for me during the completion of this project.

Last but not least, I would like to give my gratitude to my dearest friends that helped me in discussion, sharing idea and knowledge to complete my every task and this project.

May God bless all of you. Thank you.

ABSTRACT

Fire is very dangerous. It could bring extraordinary losses, damages to the property and worse is deaths. There is a need for us to detect and prevent the fire from happened at the first place. Therefore, the Fire Alarm and Detection System must be developed in order to overcome the problems. This system must detect the early stages of fire. This system could prevent the fire from occur with its features. If there is fire, the system will detect it and send notification to the user. Smoke also could be the sign that the fire is happening. This system has the ability to detect the smoke and send the warning notification to user. Gas leakage also could bring bad thing especially to the occupant of the house. This system also helps to detect if there is gas leaking in the house and also notify the user by SMS so that the user can ask for help by calling the emergency number immediately. After all of the causes of fire being identify, then the occupant of the house must leave and evacuate the house immediately and wait for help to arrive. This system has its unique feature where it is equipped with the emergency door. The emergency door will open automatically if any bad thing that lead to the fire happens in the house.

TABLE OF CONTENTS

CONTENT   **PAGE**

CHAPTER ONE: INTRODUCTION

CHAPTER TWO: LITERATURE REVIEW

CHAPTER 1

INTRODUCTION

This chapter provides the background and rationale for the study. It also gives details of significance of this project, the objectives, project scope, summary and problems that led to this research.

1.1   Project Background

Fire is an undesirable event that could bring a great loss of social wealth and human life. To prevent this losses, various alarm systems have been developed such as smoke detectors, temperature sensor-based systems and others. If there is a fire in building, the key aspect of fire protection is to identify the developing fire as soon as possible so that we can alert the building's occupants and fire emergency organizations. This is why we should have a fire detection and alarm system installed in your premises.

As technologies evolved and instruments such as temperature sensors, camera and others become affordable, various automated fire alarm systems are now available. In conjunction with the cheaper instruments, internet based and wireless broadband technologies, have also improved and there are now various systems that enables cheap, high rate data transmission and wireless networking.

The solution for the problems is to develop a new fire alarm system that alerts the user instantly when any events occur and asks for permission from the user to contact the emergency numbers and asking help from Fire and Rescue Department. This project using the Arduino Uno, GSM module, servo motor, sensors such as MQ-2 smoke sensor, MQ-6 gas sensor and flame sensor to overcome this problem. Arduino Uno is the main component for this project since it will be use as the microcontroller of this project. The use of MQ-2 smoke is to detect the smoke. MQ-6 gas sensor is use to detect if there is gas