UNIVERSITI TEKNOLOGI MARA

MAGNETIC SECURITY AUTOMATION SENSOR LOCKS

MOHD AMZAR BIN NASARUDIN

Dissertation submitted in partial fulfillment of the requirements for the degree of

Bachelor of Engineering (Hons.) Electronics Engineering

Faculty of Electrical Engineering

Universiti Teknologi Mara

July 2013

ACKNOWLEDGEMENT

In the name of Allah S.W.T, the Most Merciful with the deepest sense of gratitude, who the strength and ability to complete this thesis. All perfect praises belong to Allah S.W.T.

This thesis was written based on two semester work. During the study period, I obtained tremendous help and support from people with various backgrounds. I am deeply indebted to my supervisor: Tuan Norjihan Tuan Yaakub. Her constructive advice provided me great help through my research period and also in drafting this thesis.

I would like to share my greatest appreciate to my parents who always give their support to me. I also want to thanks to all my friends for their help and support to complete this thesis.

Thank you.

ABSTRACT

This project paper describes the implementation of a magnetic security automation sensor locks by using Arduino Mega 2560 microcontroller with face recognition system. This security system usually used in the house, office or building to protect it from intruders during the absence of the occupants. Interfacing between software and hardware by using serial port communication are used in complete system. The system runs on two stages. First, the face recognition system will recognize the user based on the data in database by using OpenCV library and C++ language. Second, for successful user recognition, a correct password must be key-in to open the door. Furthermore, this security system is added with PIR sensor and magnetic locks to enhance security. The performance of the developed security system is assessed on the face recognition, motion sensor and magnetic locks.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

Security system such as motion detection, glass-break detectors, and vibration or inertia detector can be handly for all sort of things including building security systems and even home automation systems. Almost all the security systems provide a simple security systems that are easily broken down by intruders.

Magnetic automation sensor locks provide high security system which specified as use at home or in the office. This project is the implementation of security systems by using Arduino Mega 2560 microcontroller with face recognition system. The reasoning behind using face recognition system is the accurate and allows for high enrolment and verification rates in security system. Besides that, it is also the biometric that allow the person to perform passive identification in a one to many environment such as busy Airport Terminal.

Basically, the system is the interfacing hardware and software. The face recognition was developed by using OpenCV library and Dev C++ compiler. The method of this recognition system is according to Eigen faces method and Haar Cascade classifier [1]. The webcam was used to send the video frames to face recognition software which running in computer. If the software detect a face of the user, it will recognize it by using the data in database. Then, the face recognition software will communicate