



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**DEVELOPMENT OF VEHICLE DOOR SECURITY
USING SMART TAG AND FINGERPRINT SYSTEM**

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Computer Engineering Technology (Computer System) with Honours.

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APPROVAL

This report is submitted to the Faculty of Mechanical and Manufacturing Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Mechanical Engineering Technology (Computer System) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Projek ini yang bertajuk Pembangunan Keselamatan Pintu Kenderaan menggunakan Sistem Tag Pintar dan Cap jari. Arduino sebagai pengawal antara Sensor RFID, Sensor Sidik Jari, Buzzer, LCD, LED dan Relay. Projek ini dilaksanakan untuk tujuan keselamatan untuk melindungi keselamatan kenderaan dari pencurian kenderaan. Ia sangat berguna dan penting untuk memberi amaran kepada orang-orang yang mempunyai kenderaan untuk melindunginya dari kecurian. Ini adalah sistem yang sangat penting untuk dilaksanakan di pintu utama kenderaan. Projek ini mula berfungsi apabila akses pengguna sama ada dari satu cap jari sistem atau tag pintar untuk mengunci dan membuka kunci pintu. Sistem cap jari hanya pengguna yang boleh mengakses manakala sistem tag pintar boleh diakses oleh pengguna atau saudara pengguna apabila mereka meminjam kenderaan untuk kecemasan. Pintu kenderaan tidak boleh dibuka apabila cap jari atau tag pintar yang tidak betul adalah akses. Sebaik sahaja tag pintar yang tidak betul diakses oleh orang yang tidak dibenarkan, buzzer akan diaktifkan dan menghasilkan tahap bunyi penggera yang tinggi untuk memberi amaran kepada pengguna. Mikrokontroler Arduino Uno dikawal oleh keseluruhan sistem projek.

ABSTRACT

This project entitled Development of Vehicle Door Security using Smart Tag and Fingerprint System. The Arduino as a controller between RFID Sensor, Fingerprint Sensor, Buzzer, LCD, LED and Relay. This project implemented for security purpose to protect the safety of vehicle from vehicle theft or burglary. It is very useful and important for alert the people who have vehicle to protect it from theft. This is a very important system to be implemented at the main door of vehicle. The project started to work when the user access either than one system fingerprint or smart tag to lock and unlock the door. The fingerprint system only user can access their fingerprint whereas the smart tag system can access by user or user's intimate relative when they borrow the vehicle for emergency. The vehicle door cannot be opened when unmatched fingerprint is access or incorrect smart tag is access. Once the incorrect smart tag is access by unauthorized person, the buzzer will be activated and produce a high level of alarm sound to alert the user. The Arduino Uno microcontroller is controlled by the entire system of the project.

DEDICATION

I would like to dedicate my thesis to my beloved parents (Mr. SAMINATHAN s/o PERIAPIAN and Mrs. NAUNILLA d/o PERUMAL), my siblings (KOMATHY d/o SAMINATHAN and ANBARASAN s/o SAMINATHAN) and my dear friends.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

The principle ideas and development of the vehicle door security using smart tag and fingerprint system are given in this chapter. In this chapter, the clarification of the project background, problem statement, objectives and project scope will create into few areas. Furthermore, the system of this project will be explained on how it is functioning and it's important for people in this chapter. Besides, the most punctual reference purpose of the planning for this vehicle security system will creatures serves also in first chapter. This segment are important since it will be the guidance for the clients. The developer can achieve the desired objectives dependent on the segments included into this section with the plainly decided clarification stated.

1.1 Project Background

Nowadays, vehicle especially car is an automobile and most important transport for human. As the term of statistics, there are many cases or reports due to the vehicle burglaries and theft and it keep increase time by time. The crime statistical reports state that vehicle burglary are increasing dramatically around the world especially in Malaysia. According to the General Insurances Association of Malaysia (PIAM) report, Malaysia is a one of the top 10 ranking country in the world for vehicle burglary. The statistic of vehicle theft for first half of year 2016 was 11,796 number of vehicles. This issue has created fear among the people. In this way, there are many ways that have been taken via vehicle owner to more secure the car from burglaries or theft. Hence, every vehicle it is important to have or install a security system.

In era of globalization, security system assumes as essential element to prevent unauthorized person that cannot be entry at secured place without approved from owner. Meanwhile, the security system was essentially divided into two different kind which used a usual key of door lock and another is used an electronic automatic identification system. In general, lock was simple device that can be hacked by unauthorized person. The lock system was fake functional used in security system. Most of the alarm system is using it worked in alarm to send notification to the vehicle owner. The vehicle owner just knows their vehicle status in this range which depends on their alarm sirens only. An elective strategy is expected to increase the scope of effectiveness and the proprietor will have better security notification if their vehicle.

The title of this project is Development of Vehicle Door Security using Smart Tag and Fingerprint System. These two systems can provide a protection for vehicle from theft and also for the security purpose. The smart tag system is using for access the tag which have security password by user to unlock the vehicle door. Besides, the fingerprint system is high performance security technique using for access user's fingerprint to unlock the vehicle door. In this project, user can access either than one of these two systems allow to open the vehicle door. The fingerprint system only user can access their fingerprint whereas the smart tag system can access by user or user's intimate relative when they borrow the vehicle for emergency. In the case that the smart tag is missing or stolen by unauthorized person, the user can block their tag immediately for cannot to be access again because the tag have security password. Moreover, the vehicle door cannot be opened when unmatched fingerprint is access or incorrect smart tag is access. Otherwise, the buzzer will be activated and produce a high level of alarm sound to alert the user when any unauthorized person could have attempt to theft. In addition, the entire system of this project is controlled by Arduino Uno to achieve the aim in this project.

1.2 Problem Statement

Nowadays, vehicle theft is a kind of assets crime that frequently occurred in Malaysia. By the quick advancement of technology and development of many innovation in Malaysia, the quantity of this crime still can't be reduced. This incident is happened because of minimum standard of security system is installed by vehicle manufacturers such as alarm system. However, this system is not effective enough for security because of low limitation range between vehicle and its owner. By this way, theft can attempt easy to deactivate the security system in the several seconds. Other than that, the insurance agencies have higher pressure as they need to pay the claims made by the clients. As a result, the insurance agencies need to improve the insurance premium. For this situation only a small percentage of people could manage the cost of a good insurance premium. The rise of the insurance premium is causes of installed the shortage of security system to the vehicle. Within this project, the vehicle door security using smart tag and fingerprint systems were developed to prevent the vehicle burglary. Even though, the cost must be affordable and the owner could keep their vehicle with full safety.

1.3 Project Objectives

There are several objectives that have been recognized in this project and listed as below:

1. To develop the security system for vehicle by using fingerprint and smart tag technology.
2. To design a circuit using Arduino UNO in the support of Smart tag and Fingerprint Systems.
3. To protect the safety of vehicle from vehicle theft.

1.4 Scope of Project

In order implementing this project, various scopes have been detected. This project can prevent theft and burglaries that often occurs around us nowadays. With the occurrence of this project, most vehicle proprietor can keep their vehicle without any fear. I am also designing this project with low cost with high performance and fulfill of secure.

The advancement of the security system is continuing developing quickly by every year. The security system top need is the wellbeing issue where this system cover about the controlling and dealing with devices. Besides, the design of the security system control demonstrates an extraordinary effect in term of production cost and maintenance cost. At present, most vehicle security system solutions have been done by the use of usual technologies such as alarm system. Unfortunately, it is less secure due to its restriction distance.

In this project, the vehicle security system is developing by using Smart Tag and Fingerprint System is better way to prevent the vehicle theft. Otherwise, the basic information about components will be discussed briefly including Smart Tag Reader, Fingerprint Sensor and a few devices and Arduino UNO software application. The goal of this project is to protect the safety of vehicle from vehicle theft. This chapter will briefly explain about the study and the idea based on the previous project together with the theory to achieve the aim of this project. The hardware and software of this project will be analyzing each part in details.