UNIVERSITI TEKNIKAL MALAYSIA MELAKA

SMART SECURITY SYSTEM FOR MOTORCYCLE USING RFID WITH APPS

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electronic Engineering Technology (Telecommunication) with Honors.

by

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This report is submitted to the Faculty Of Electrical And Electronic Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electronic Engineering Technology (Telecommunication) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Baru-baru ini, kecurian motosikal adalah pada tahap tinggi yang mengejutkan. Matlamat projek ini adalah untuk membangunkan Sistem Keselamatan Pintar untuk Motosikal menggunakan RFID dengan Apps. Objektifnya adalah untuk mereka bentuk keselamatan berteknologi tinggi moden dan sistem tanpa kunci kepada rangka kerja keselamatan motosikal menggunakan Pengesanan Pengenalan Frekuensi Radio (RFID) dan Android Apps dan akhirnya membangunkan sambungan antara fungsi RFID dan Android Apps kepada sistem motosikal untuk memberikan sistem keselamatan yang lebih baik. Mikrokontroler Arduino Nano telah ditetapkan sebagai pengawal teras untuk mengawal input dan output projek ini. Kesimpulannya, sistem anti-kecurian keselamatan ini dibina menggunakan Pengenalan Kekerapan Radio (RFID) untuk tujuan pengesanan pihak berkuasa. Selain itu, Android Apps diguna pakai menggunakan Bluetooth sebagai peranti komunikasi antara pemilik melalui memasukkan nama pengguna dan kata laluan dalam aplikasi android. Oleh itu, motosikal akan lebih selamat dengan sistem anti kecurian baru ini

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ABSTRACT

Recently, motorcycle theft is at a staggering high. This project's goal was to develop Smart Security System for Motorcycle using RFID with Apps. The objectives were to design a modern hi-tech security and a keyless system to motorcycle security framework using Radio Frequency Identification Detection (RFID) and Android Apps and lastly to develop the connection between the RFID and Android Apps functionality to the motorcycle system in order to give a better safety system. Arduino Nano microcontroller was set as the core controller for governing the input and output of this project. In conclusion, this security anti-theft system is built using the Radio Frequency Identification (RFID) for authority detection purposes. Besides, Android Apps are adopted using Bluetooth as the communication devices between the owners through keying in the username and password in the android apps. Therefore, motorcycles will be more secure with this new anti theft system.

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DEDICATION

This study is wholeheartedly dedicated to my beloved parents, who have been my source of inspiration and gave me strength when i thought of giving up, who continually provide their moral, spiritual, emotional, and financial support. To my brothers, sisters, relatives, mentor, friends, and classmates who shared their words of advice and encouragement to finish this study. And lastly, i dedicated this to the Almighty God, thank you for the guidance, strength, power of mind, protection and skills and for giving me a healthy life.

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LIST OF ABBREVIATIONS

JPJ	Road Transport Department
RMP	Royal Malaysia Police
RFID	Radio Frequency Identification Detection
IC	Integrated Circuit
WPA	Wi-Fi Protected Access
MIT	Massachusetts Institute of Technology
IDE	Integrated Development Environment

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CHAPTER 1

INTRODUCTION

1.0 Introduction

The motorcycle is one of the famous transportation for natives in Malaysia. The reason motorcycle turns into the most loved because of accommodation amid the activity clog and furthermore spare cost as far as fuel and upkeep. Be that as it may, motorcycle rank at the highest point of the property violations because of absence of security framework and furthermore the imprudence of the proprietors.

1.1 Background

In this manner, motorcycle has been the best, advantageous and a moderate mode transport in a large portion of the city in Malaysia. In spite of that, the motorcycle progresses toward becoming properties that as often as possible focus by the burglary due to effects of exchanging and absence of the security framework (Ouyang et al. Our national Royal Malaysia Police (PDRM) has propelled different tasks in tending to the issue, however the result not by any stretch of the imagination persuaded since the primary issue most likely because of individuals, for example, careless disposition and absence of their security frameworks on the bike. The fundamental contrasts amongst dynamic and aloof hostile to robbery framework is the place the latent against burglary framework ready to naturally bolt when the start or component has killed and there is no extra is

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required. While in the dynamic, hostile to burglary framework, it needs some automatic or physical activity, for example, pushing a catch on the remote control or putting a "bolt" before the motorcycle are being initiated. In spite of the fact that, there are assorted instruments or dynamically hostile to robbery frameworks that likely ready to buy at the market yet generally the expenses are not moderate by the motorcycle biker (Nasir and Mansor 2011). Radio Frequency Identification Detection (RFID) is a remote innovation, which broadly connected into the entrance control and security framework (Jinaporn et al. In the worldwide, RFID was quickly rising in Latin America since the arrangement of RFID innovation permits decreasing creation and transportation expenses and time developed inventories and additionally enhances association profitability (Rodríguez et al. The real parts of an RFID framework are labelled and the per user which trades information through the radio wave naturally (Shah and Singh 2016).

1.2 Problem Statement

These days, the developing quantities of property violations, give extensive effect on overall and large of a Malaysia wrongdoing list. As reported by journalist Ani Shamira (2016), where the aggregate wrongdoing record has been raised around 4.5 per cent, which fundamentally because of the heightening proportion of property wrongdoing. Among the classifications in property wrongdoing, motorcycles burglary is positioned at the highest point of violations happened contrasted with others. There are 12,216 bike robbery cases has been accounted for in a year ago 2016 where a normal of 33 motorcycles has been stolen each day the nation over.

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The numbers demonstrate that the cruiser burglary issue achieved a basic level and wind up noticeably prime focus for thief. Despite the fact that Royal Malaysia Police (RMP) has propelled couple of procedures or projects to battle the issue anyway it appears like doesn't work effetely. This sort of cases happened for the most part identify with some impressive factors, for example, abnormal state joblessness, high populace thickness, low salary and precarious of Monetary. An examination done by Zulkifli et.al (2015) where applying negative binomial relapse demonstrate an investigation on vehicle burglary wrongdoing in peninsular Malaysia demonstrate that high populace thickness, for example, Klang Valley, Johor Baharu and Penang having the most elevated wrongdoing rate of robbery motorcycles. Different reasons, it may be likewise happening because of the absence of their security frameworks on the bike and furthermore individual issue, for example, careless disposition of the proprietors.

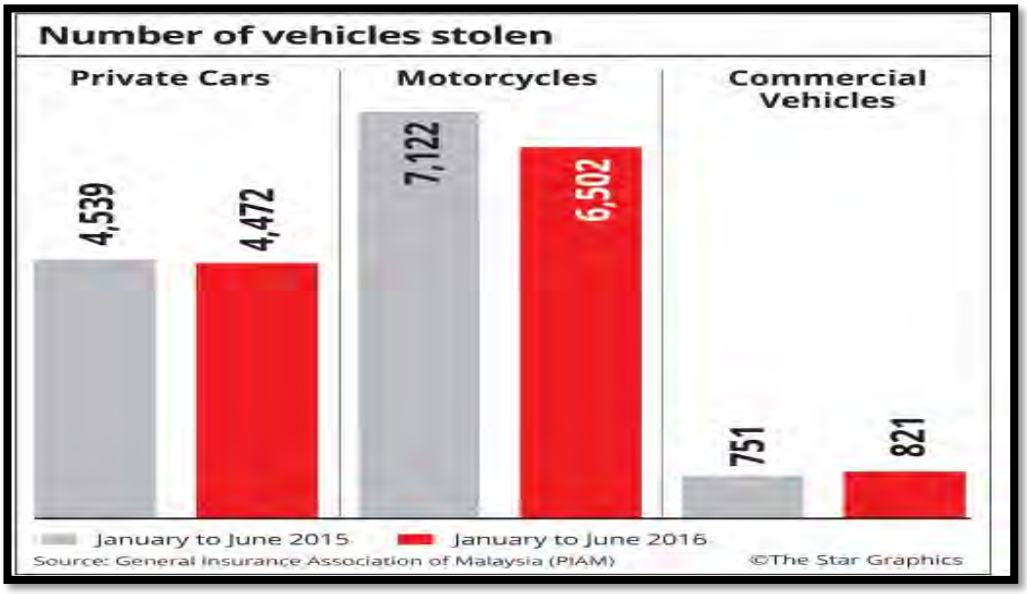

Figure 1.1: The number of vehicles stolen within January to June of 2015 and 2016. (Source: General Insurance Association of Malaysia, PIAM in 2016)

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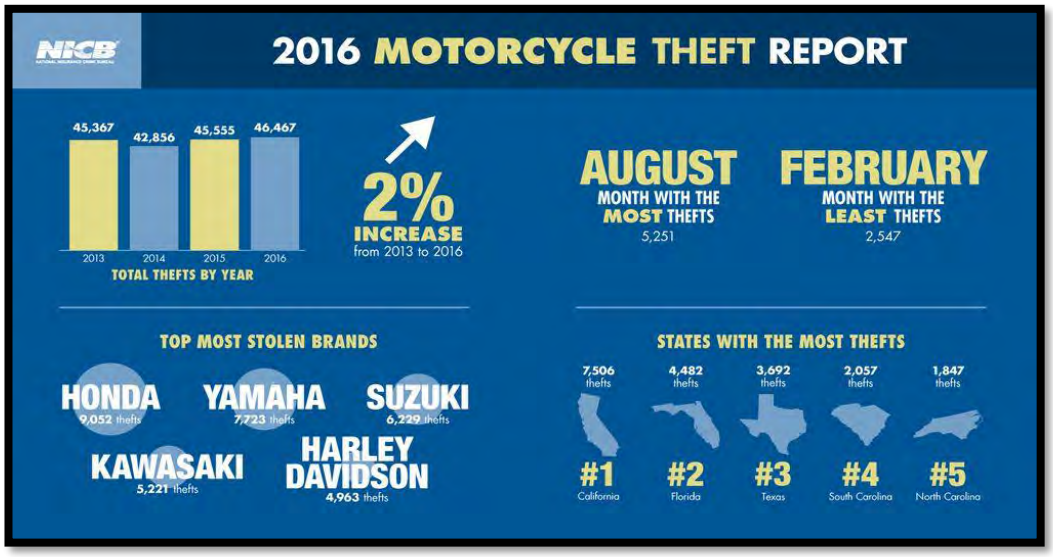

Figure 1.2: Motorcycle theft statistics for 2016 (www.motorcyclistonline.com,2017)

Because of this risk, numerous motorbike security framework makers are guaranteed to give a superior assurance framework. It's no uncertainty, some are real while others are questionable. Positively, there are assortments of motorcycle security devices sold in the market, for example, chain bolt, plate bolt, U-bolt, alert framework and also some remote security gadget. In any case, there are a few advantages and disadvantages in each of the counter robbery gadget. For example, the bolt frameworks having a couple of constraints, for example, low sturdiness, short lifetime traverse and not an erosion safe which most likely will cause breakdown or adhered when presented to climate components. Moreover, it is less transportability due to overwhelming henceforth it's troublesome and bother to transport. Other than, of that, taking a bike is all the more effective, contrasted with engine vehicles since light weighted and simple for exchange. Subsequently, the bike turns into a prime focus for criminals. Along these lines, a perfect against burglary

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framework ought to be cautious or illuminate the motorbike proprietor when there is some unapproved drawing closer and endeavor to take or move your bike. On the other hand, some of the individuals will disregard the caution framework and in addition it is anything but difficult to disengage from battery link or been chopping around the expert burglary. Another issue that can't be ignored is the general cost of the counter robbery gadgets.

1.3 Objectives

Based on the problem statements discussed above, the objectives of this study are:

i. To improve motorcycle security system using Radio Frequency Identification Detection (RFID) and Android Apps to give the best possible level of safety.
ii. To design a modern hi-tech security and a keyless system to motorcycle security framework
iii. To develop the connection between the RFID and Android Apps functionality to the motorcycle system.

1.4 Scope

The scopes of this research work are established based on the objectives that mentioned. This security, anti-theft system is built using the Radio Frequency Identification (RFID) as the authority detection purpose. Another essential point, the Android Apps that using Bluetooth will be adopted as the communication devices

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between the owners through key in the username and password in the android apps. Lastly, Arduino Nano microcontroller will set as the core controller for governing the input and output of this project.

1.5 Organization

This project centers around advancement an ease and dependability of motorcycle security framework by utilizing RFID and Android Apps. This report comprises of five chapters. Initially, a short introduction to the issue, objective and scope are given in chapter one. At that point, take after by chapter two writing literature review on existing methods embraced and different advances that actualized in past venture. In the interim, the comparison in regards to pros and cons will be discussed. Next, the components and method portrayal that wanted to utilize will be clarified in chapter three. Moreover, a brief of the outline stream of the project may appear here. In the chapter four, the outcomes information of results, including data tabulation and project analysis will be shown then discussed. Finally, conclusion and future suggestion will be underlined in chapter five.

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CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

In this chapter, the purpose of this literature review is to analysis previous projects and research that done by other specialist that significant to the burglary motorcycle security framework. Meanwhile, the legitimacy of past research will be discussed and determine. Similitude, literature that was explored incorporated the wireless technology adopted, features and analyzed for completeness regarding to their strength and weakness also with respect to their quality and shortcoming. Methods and results in past papers will be contrasted and assess all together with creating great philosophies for the fruition of this project.

2.1 Related Works

2.1.1 Development of Bluetooth Technology

Bluetooth innovation enables to interface a wide range of electronic gadgets remotely to a framework for the exchange and sharing of information and this is the primary capacity of Bluetooth. Mobile phones are associated with sans hands earpieces, remote console, mouse and mike to PCs with the

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assistance of Bluetooth as it transmits data from one gadget to another gadget. Bluetooth innovation has numerous capacities, and it is utilized most regularly in remote correspondences' market. The highlights of Bluetooth are Bluetooth innovation utilizes radio waves to communicate between gadgets. The majority of these radio waves has a scope of 15-50 feet. As per the authority Bluetooth site, Bluetooth utilizes a low-control motion with a most extreme scope of 50 feet with adequate speed to empower transmission of information. The pairing procedure identifies and connect any two gadgets to each other. It likewise keeps obstruction from other non-paired Bluetooth gadgets in the zone. It utilizes the greatest power just when it is required, thus preserving battery life.

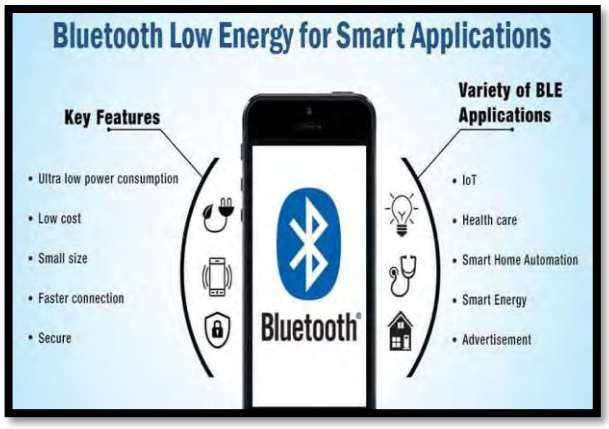

Figure 2.1.1.1: Bluetooth system application (www.bluetooth.com)

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