# SMARTPHONE DOOR LOCK ACTIVATED VIA BLUETOOTH

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**This Report Is Submitted In Partial Fulfillment Of Requirement For The Bachelor Degree Of Electronic Engineering (Computer Engineering)**

**Fakulti Kejuruteraan Elektronik dan Kejuruteraan Komputer**

**Universiti Teknikal Malaysia Melaka**

**June 2014**

**UNIVERSTI TEKNIKAL MALAYSIA MELAKA**
FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

**BORANG PENGESAHAN STATUS LAPORAN**
**PROJEK SARJANA MUDA II**

**Tajuk Projek : SMARTPHONE DOOR LOCK ACTIVATED VIA BLUETOOTH**

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# DEDICATION

Special dedicated to my beloved parents, family, and fellow friends, who had strongly encouraged and supported me in my entire journey of learning.

## ACKNOWLEDGMENT

I wish to express my special thank and sincere gratitude to my project supervisor, Siti Aisyah Binti Anas,for giving me an opportunity to exposed in this project, and also the moral supports and advises given throughout this project. I would also like to thank to all lecturer that‟s who always providing advises and opportunity for the project improvement.

Secondly, I would like to thank my beloved family members who always giving actuation and moral support to me throughout the whole studying life in UTeM and in this project.

The last but not least, I would also like to express my appreciation to all the technician, friends and all individuals that helped me throughout this Bachelor Degree Project 2 (PSM 2), which I have not mention their name. Without all of you, this project will not be finished successfully.

Thank you.

# ABSTRAK

Pada masa sekarang ini, telefon mudah alih adalah perkara penting dalam kehidupan. Kita dapat melihat sekeliling.orang sentiasa menggunakan telefon bimbit walau di mana-mana saja. Pelbagai perisian yang digunakan dalam telefon bimbit, contohnya seperti android, OS mac, Windows dan lain-lain. Selain itu, telefon pintar juga boleh digunakan untuk mengaplikasikan sistem keselamatan rumah. Oleh itu, sistem keselamatan rumah pada peranti mudah alih menjadi semakin popular. Projek ini menggunakan telefon pintar yang diprogramkan dengan pengaktifan Bluetooth untuk mengawal sistem kunci pintu rumah. GSM adalah medium untuk menghantar pesanan ringkas kepada pengguna tentang status sistem kunci pintu rumah. Untuk mengaktifkan sistem keselamatan rumah, jarak pada Bluetooth dan kata aluan pada perlu tepat. Jika salah satu spesifikasi sistem pintu tidak diisi, pintu akan menghantar pesanan ringkas ke telefon mudah alih dan pintu tidak boleh dibuka. Mikropengawal Arduino akan mengawal semua fungsi perkakasan dan perisian dan Mikropengawal PIC akan mengawal fungsi pesanan ringkas.

# ABSTRACT

Now a day, hand phone is the important thing in life. Anywhere we go, we can see people used it very frequently. Mobile phone has various types, for example like android, OS mac, windows and etc. Home security also same as mobile phone, it‟s important to take care about our belonging. Home security systems are becoming increasingly prominent features on mobile devices. In this project, I want to develop mobile phone to communicate via Bluetooth with home door lock system with certain range. GSM used as the medium to know the status of the home door lock system. To open or close the door it depends on range of Bluetooth and the password that have been set. If the one of the door system specification not filled, the door will send a massage to mobile phone and can„t be open. Arduino microcontroller will control all the hardware and software function and PIC microcontroller will control the notification message.

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# LIST OF ABBREVATION

| | | |
|---|---|---|
| RFID | - | Radio Frequency Identification |
| USB | - | Universal Serial Bus |
| GSM | | Global System for Mobile |
| IDSM | | Integrated Demand Side Management |
| GUI | | Graphical user interface |
| RC | | Radio Control |
| UART | | Universal synchronous receiver/transmitter |
| PWM | | Pulse-width modulation |
| SPDT | | Single Pole Double Thtow |

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# CHAPTER I

# INTRODUCTION

## 1.1 Project Overview

This project presented a smartphone door lock activated via Bluetooth, where the door will open without key or it's called wireless door lock. The successfully signal from smartphone application will be received by a door Bluetooth as trigger source. The proposed features and methods of the smartphone door lock system will be tested and analyzed, so that the function to open the door through smartphone will meet and the connection between GSM will make user get the notify when the door was open. The wireless door system constructed will have a battery source just to power up the motor, and other electronic components will power up solely based on wireless connection. This smartphone door lock system via Bluetooth are also designed to give an advantage for disable people to open the door without get help from the others and make vault door is more secure than casual door lock system..

## 1.1 Motivation For Research

The motivation for this project is to design and develop a smart door lock via Bluetooth for house safety and future technology usage. The development of this system will be using the android phone as to open the door via Bluetooth into the proposed system. The proposed system will function to open the door and the massage will pop-up

at phone when the rupture force happen. At the meantime, the householder can react as soon as possible. Development of the system can increase the efficiency of the security on the house and help the reduction of the rupture force now a day. Apart from that, this system can reduce usage of RFID card and safe the nature. The android OS is currently the lead on mobile market share while Symbian OS was already discontinued. This proposed system allows a user to lock or unlock a door a short range from the door. The application was designed to allow the user to also check the status of the door. The mobile device requires a password to increase the security of the system. The hardware on the door uses a microcontroller to control a linear actuator that acts as the locking mechanism. The Bluetooth protocol was chosen as a communications method because it is already integrated into many Android devices and is secured through the protocol itself.

## 1.2 Objective

The objectives of this project are:

i. Design android phone application for home security

ii. To design and develop door lock system via Bluetooth and GSM using Arduino UNO Microcontroller

Hence it will improve the self-responsibility awareness among the householder. By using this proposed Bluetooth door lock system, there will be no more cards needed, no more house worries, hence no more hassle! (You can forget or lose a key, but you cannot forget your hand phone) In the end, this system will able to improve the security of house system and the same time will reduce house break criminal

## 1.4 Problem Statement

Android phone usage expands globally, various applications available in android phone like massage, calling, games, internet and many more. One of the networking/wireless applications there is Bluetooth. However, even Bluetooth well known to the public but use Bluetooth on android phone is very less, especially in terms of home security. Mobile phone was been integrated into our life today. Technology-based home security and automation have become commonplace. Tasks such as locking doors, turning on/off lights, and controlling air conditioning can now be done remotely. According to Kaur [1], home Automation can be useful to those who need to access home appliances while away from their home and can greatly improve the lives of the disabled. This application has been researched and developed since the days of the landline phone [2], but it has become much more effective with the Advent of internet-capable mobile devices. Advances in mobile technology and cloud computing allow for the management of many different aspects of the home through an internet connection offering considerable flexibility for users, such as Yale's Locks & Hardware new device [3]. According Kuang-Yow Lian [4] The most important part of every home security will be the users to enter and go out the door careful identification [5][6]. The way we manage a entrance guard are many, some use a password, some RFID sensor or fingerprint way, and face recognition methods [7]. These are some shortcomings in the implementation, such as lock the keyboard is too small, some elderly or persons with mobility problems, very inconvenient to use the keyboard to input username and password. RFID induction it is easy to be stolen or lost, this method can only perform a function, because he is passive and fixed. As for the use of fingerprint and face recognition so that some people find objectionable, because the privacy of the body as a recognition tool, is a respected human rights practices. Some people do not like using their own fingerprints and face images do establish the work of the file [8]. face recognition is a very high level computer vision task, in which many early vision techniques can be involved. The first step of human face identification is to extract the relevant features from facial images. The question naturally arises as to how well facial features can be quantized. If such a quantization if possible then a computer should be capable of recognizing a face given a set of features. There are three major research

groups which propose three different approaches to the face recognition problem. The largest group has dealt with facial characteristics which are used by human beings in recognizing individual faces. The second group performs human face identification based on feature vectors extracted from profile silhouettes while the third group uses feature vectors extracted from a frontal view of the face [9].

## 1.5 Scope Of Work

The scopes of works in this project are divided into two parts, which is:

(i) Projek Sarjana Muda I (PSM I)

(ii) Projek Sarjana Muda II (PSM II)

The designs and developments of this smartphone activated door lock via Bluetooth are divided into two parts, which is external deliverables and internal deliverable.

### 1.5.1 Projek Sarjana Muda I (PSM I)

The scopes of work for PSM I are the external deliverables are elements which are touchable or seeable that produced at the end of this project. The external deliverables of this project consist of the Door lock bar, box of the door lock system (with microcontroller and Bluetooth module), android phone and Global System for Mobile Communications (GSM). The phone is resumed to transmit the Bluetooth signal to the Bluetooth module in the box that to activated the microcontroller with the aim of the door to open, where GSM functions as an indicator to inform the user about the status of the overall system. While the box of the door locks system is to assemble at the door.

The internal deliverable in this imposed project is the Arduino programming software and GSM coding. The Arduino and GSM program is required in order to allow the system to notify the status of the system and to activate the functional of the door lock, Bluetooth and input/output respective household use. These data and system can be fetched and executed on the user phone.

The proposed smartphone activated door lock via Bluetooth will operates according to as following:

- User can set the password
- Notify user the status of the door
- Increase the accuracy, reliability and security of the house
- Time, cost and environmental friendly
- Improve the awareness among the householder

#### 1.5.1.1 Technical Structure

The technical structure of this system is divided into four section or part. The part is show in Figure 1.1

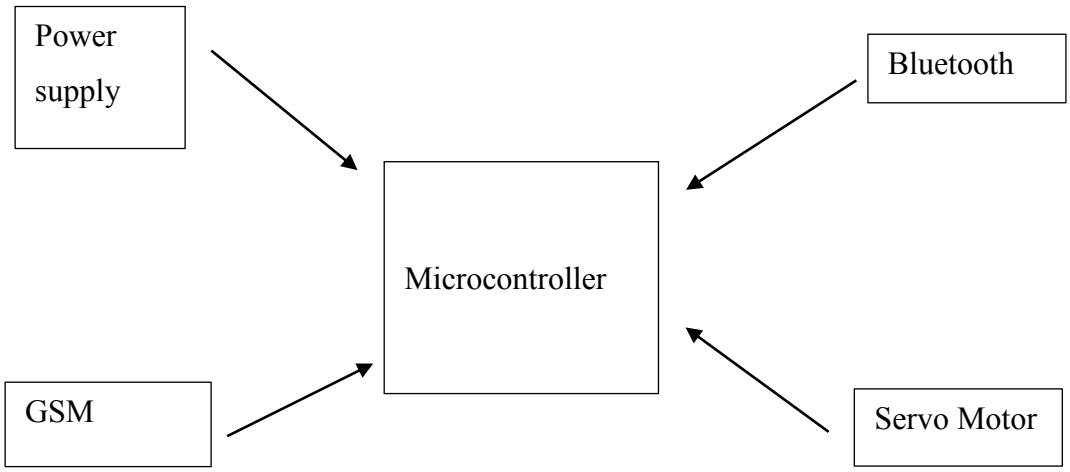


Figure 1.1: Technical Structure Block Diagram

### 1.5.2 Projek Sarjana Muda II (PSM II)

As in PSM II, There are seven phases of work need to be done in order to complete this project. The first phase that needs to be settled first is problem statement identification. The problem faced by the previous approaches [3] included inaccuracy, time consuming, reliability, and security. The problem statements are reviewed throughout the project, to make sure the new system created able to solve the problem facing by the previous approaches [3]. Beside problem statements, the objectives of the project need be determined first in order to understand the purpose of the project and keep the project on the correct track. In this project, the objectives are to design and develop door lock system via Bluetooth and GSM using Arduino UNO Microcontroller and house security. After the problem statements and the objectives are identified.