

# Keyless Entry To Car With Authentication

<sup>#1</sup>Prof. T. H. Gurav, <sup>#2</sup>Madhur Bhatia, <sup>#3</sup>Sonu Kumar, <sup>#4</sup>Shubham Gangwani

<sup>3</sup>siddhartha.sonu30@gmail.com

<sup>#1234</sup>Department of Computer Engineering,

SPPU University  
SKNCOE, Pune-411041, India.



## ABSTRACT

This paper addresses the role of IoT in the field of Modern automobile and how this technology is used to overcome the drawbacks of present technologies that are used to access the car. Nowadays smartphones are becoming very popular and there is also a boom of IoT everywhere. IoT provides connection of various objects such as a smartphone, building, vehicles and other physical devices to a sensor, software with the help of internet. IoT built a network in which we can manipulate and control devices and environment remotely according to our need. It is used to collect, manipulate process data in real time and provide the smart solutions. Traditionally we used to have mechanical keys, which we need to carry with us all the time and it is also a single point of failure. And RKE is vulnerable to electromagnetic interference due to the presence of the wireless link. But by using modern technologies and IoT we can overcome the drawbacks and provide advanced level security that protects the car from unauthorized access. This paper proposes the concept of an Android app based car locking and unlocking system that uses Bluetooth to access the car and provides an added Authentication by generating OTP. It also separates the system from outside world, thereby providing an isolated environment to our system. So this paper provides the survey of present car locking techniques and our own unique way to access the car with Advance Level Security.

**Keywords— (IoT) Internet Of Thing, (RKE) Remote Keyless Entry, (PKE) Passive keyless Entry, Microcontroller, Bluetooth, Server, (OTP) One Time Password, Electromagnetic Radiation**

## ARTICLE INFO

### Article History

Received: 6<sup>th</sup> May 2017

Received in revised form :

6<sup>th</sup> May 2017

Accepted: 8<sup>th</sup> May 2017

**Published online :**

**23<sup>rd</sup> May 2017**

## I. INTRODUCTION

Now days, smartphones are becoming very popular and there is also a boom of IoT everywhere. There is a tremendous growth in the industry with the use of Mobile technology and IoT in the recent years. With the use of this technology, we can modernize the car accessing system. Traditionally, we used Mechanical keys to access a car, but due to various security issues such as single point of failure, and unauthorized access, there is a need of more secure and reliable automobile accessing technology. There are various systems available such as Remote Keyless Entry (RKE) systems. Nowadays, almost all new cars come with such a system. There are two basic types of form factors. The most common one is a remote control integrated into the car key itself. The alternative form factor is a separate small remote control. Other systems such as Passive Keyless Entry(PKE) does not

require physical contact, the locking and unlocking is done if key is within certain radius of the car. All above mentioned system have various drawbacks and our system tries to eliminate them. There are various kinds of challenges that our system has to face.

## II. MOTIVATION

The motivation behind providing new car accessing system is to overcome the drawback of the presently available system. As we all know there is the boom of smartphone everywhere every single person have a High-tech smartphones now a days and android smartphones are easily available to peoples at very low cost with lots of security features, its friendly user interface makes easier to the user so that each and every person can use

this without any problem as we can say nowadays smartphone is becoming ubiquitous and very user friendly .We are designing our application as regular android application so that no user will face any problem and they can use it easily. So with the help of current technologies we can provide ease of accessing and utilizing cars in more secure ways. There are many cases, such as someone loses their key and they are not able to access their car. But we try to provide an escape route, by providing access to the car with the help of mobile application and mobile application provides security at various levels. Our system ensures the security of vehicles and also eliminates the threat of key loss.

**III. CHALLENGES**

There are various challenges that we have to consider, such as the cost of the product that we are going to implement. Presently available systems are cheap as compared to ours. Secondly, our system is using Bluetooth for communication between our app and receiver so we also have to take care of various security aspects. There are various challenges arise due to an involvement of electromagnetic wave.[4] For ex:- The first generation of RKE systems allows for controlling the access to a secured object by sending a fixed sequence of data from the remote control to the receiver. There is a risk that if someone alters this sequence of data at the receiver end, then the owner is not able to access the car. There is also the threat of signal jamming. For ex- if the owner wants to lock the car, but due to signal jamming the car door does not lock.

**IV. SOLUTION**

Every system have some challenges and every challenges have some solution to make system better.

We also have some challenges for our system like security and unauthorised access. To overcome to these challenges we are using OTP to lock and unlock the doors of the car and for unauthorised user if someone will try to break the lock of the door, the vibration sensor which is deployed inside the car will send a message to the owner that someone is trying to access to a car without your permission. The system that we are going to introduce tries to minimize the threat. As we are using the mobile application, which is connected to server through WiFi and receiver through Bluetooth of the mobile phone, the owner sends the request to the receiver through mobile application which is present in the car and the receiver confirm that the sender is genuine user or not by communicating with the server through mobile application. In this way, we can stop unauthorized access to the car. Secondly, we have to deal with signal jamming if the receiver detects any kind of suspicious activity it will inform to the user. And as we are using Bluetooth for communication so we can hide the receiver section that is placed in the car so that only owners mobile can access the system.

**V. SYSTEM ARCHITECTURE**

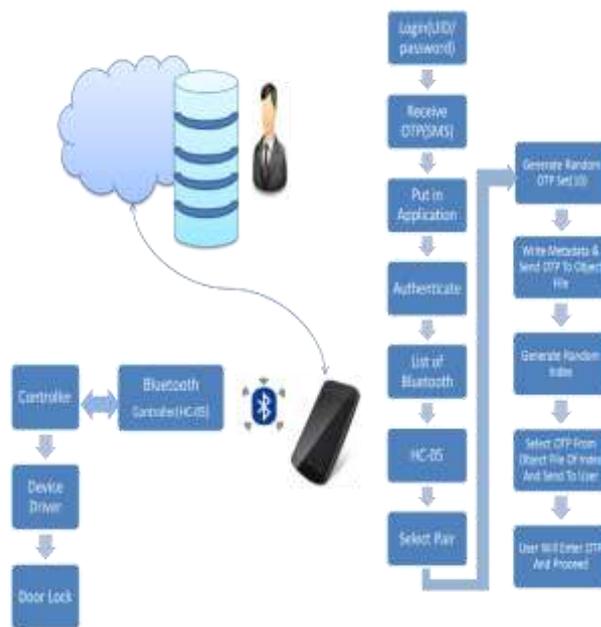


Fig 1. Architecture

To overcome the limitations of a mechanical key/lock system, we can develop a Bluetooth/Wi-Fi based car lock system. The system is composed of four components as shown below in figure one. Two of the components are connected to the Internet and will communicate in a server client relationship consisting of one server, one android based client. Android phone and Microcontroller are connected via Bluetooth which will control the fourth element of the system which is a mechanical door lock. The primary goal of the project is to allow a user to interface with the android client and can lock/unlock his car with Authentication from the Car manufacturer when the keys are lost or are not available at that very moment. The user may then at his discretion can change the state of the lock i.e. lock or unlock the car.

There are four components:-

- a) An Android application.
- b) A Microcontroller connected to Bluetooth.
- c) A Server for generating OTP via SMS.
- d) A Car Lock/Unlock System.

**VI. CONCLUSION AND FUTURE SCOPE**

In this paper, the survey has been done on the drawback of the presently available car locking and unlocking system. This paper explain the system like the mechanical key, PKE, RKE and also explains how the mobile application is used to overcome the drawback of the presently available system and providing authentication to a car owner using mobile phones.

As our whole system is working digitally so our future plan is to generate a virtual key for our family members and friends to gain a access to the car if the owner is not present at that time whenever their family members and friends need the car. We are also planning to deploy a finger print scanner on the door lock and on start button that only the car owner and their family members can access the car by their finger print recognition on the sensor. As this finger print will be stored in our database so only those people can open and access the car whose finger print is stored in the database.

## VII. ACKNOWLEDGEMENT

With due respect and gratitude we take the opportunity to thank all those who have helped us directly and indirectly. We convey our sincere thanks to Prof. T.H. Gurav for their help in selecting the project topic and support. Our guide Prof. T. H. Gurav has provided us with immense support and guidance for the same. She has always encouraged us and given us the motivation to move ahead. She has put in a lot of time and effort in this research along with us and given us a lot of confidence. We wish to extend a very big thank you to her for the same. Also we wish to thank all the other people who in any smallest way have helped us in the successful completion of this research.

## REFERENCES

- [1] Design and Implementation of a Door Lock Control Based on a Near Field Communication of a Smartphone - Chi-Huang Hung , YingWen Bai, Je-Hong Ren.
- [2] GSM Based Digital Door Lock Security System - Adnan Ibrahim, Afhal Paravath, Aswin P. K., Shijin Mohammed Iqbal and Shaez Usman Abdulla
- [3] Smart Digital Door Lock for the Home Automation - Yong Tae Park Pranesh Sthapit Jae-Young Pyun.
- [4] Robustness of Remote Keyless Entry Systems to Intentional Electro-magnetic Interference - Stefan van de Beek, Rober
- [5] A New Remote Keyless Entry System Resistant to Power Analysis Attacks - Amir Moradi and Timo Kasper.t Vogt-Ardatjew, and Frank Leferink
- [6] Efficient Key Establishment for Constrained IoT Devices with Col-laborative HIP-based Approach - Pawani Porambage, An Braeken Pardeep Kumar, Andrei Gurtov and Mika Ylianttila.
- [7] AES encryption algorithm keyless entry system - Xiaona Lv, Liping Xu.
- [8] Resisting Relay Attacks on Vehicular Passive Keyless Entry and Start Systems - Tao Yang, Lingbo Kongx, Wei Xin ,Jianbin Hu, Zhong Chen.