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Android based Secured Vehicle Key Finder System

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ABSTRACT: *To design a secured vehicle key finder system and to lock and unlock the door as well as to switch on and off the vehicle using Bluetooth technology. Mobile application is created in the android mobile using Eclipse JUNO which finds the misplaced car key with the indication of a buzzer and controls the door as well as starts the engine without key. Bluetooth keyless entry system is done using Android mobile. Bluetooth provides a way to connect and exchange information between devices. Bluetooth can be effectively used for authentication and authorization purposes.*

Keywords: *Bluetooth, Eclipse JUNO, Keyless entry system*

I. INTRODUCTION

Vehicle key finder system is very useful in finding the misplaced key. This key finder system saves the time and energy. Lost key can be found by clicking a button from the Android application created and the communication is done by mobile Bluetooth technology and a buzzer indication is given from the car key. So it is easy to find the car key within few seconds. This Embedded System uses PIC Microcontroller.

Bluetooth keyless entry system is also implemented in this project. Android application can also be used to open and close the car doors as well as on and off the vehicle. This system uses ARM Microcontroller

II. SYSTEM OVERVIEW

Bluetooth is an industrial specification for wireless personal area networks (PANs), also known as IEEE 802.15.1. Bluetooth provides a way to connect and exchange information between devices like personal digital assistants (PDAs), mobile phones, laptops, PCs, printers, digital cameras and video game consoles via a secure, globally unlicensed short-range radio frequency.

Bluetooth is a radio standard and communications protocol primarily designed for low power consumption, with a short range (power class dependent: 1 meter, 10 meters, 100 meters) based around low-cost transceiver microchips in each device.

Bluetooth technology can be very effectively used for authentication and authorization purposes. Many levels of security are built into Bluetooth technology. We can utilize all of that to provide different levels of security to our car. The car lock control can be hard coded so that it responds to commands received from a single transmitter only. The Bluetooth transmitter is identified by using the hardware address which is unique for each transmitter. Using Bluetooth technology lies in the fact that we can use ordinary mobile phones with Bluetooth technology in the place of the transmitter. So in effect the user can control his car doors and ignition from his Bluetooth enabled mobile phone. This technology has got significance since the number of Bluetooth enabled mobile phones are increasing.

The Fig. 1 Shows the Android application created using Eclipse JUNO. This application is used to control both the modules. The Vehicle Key Finder as well as Car control module.

After entering into the mobile android application named **BT Device,** the Bluetooth has to get paired with either the Key finder module or the car control module. A list of Bluetooth devices will be displayed in the mobile application as shown in Fig. 2

Fig. 1 Android Application

Fig. 2 Menu displaying Bluetooth Devices

III. DESCRIPTION OF THE SYSTEM

The Vehicle key finder system consists of two modules. The first module is the key module which is used for finding the car key by an indication of a buzzer. This system uses PIC16F877 Microcontroller. The second module is attached in the car. It performs the door open and close along with Vehicle on and off. This system uses ARM LPC2148 Microcontroller.

IV. BLOCK DIAGRAM

A. Android Application

The Android Application is developed using Eclipse JUNO. Android is a software stack for mobile devices that includes an operating system, middleware and key applications. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language.

The Android Development Tools (ADT) plug-in adds powerful extensions to the Eclipse integrated environment, making creating and debugging our Android applications easier and faster. It uses Eclipse; the ADT plug-in gives an incredible boost in developing Android applications. It gives access to other Android development tools from inside the Eclipse IDE. It provides a New Project Wizard, which helps quickly create and set up all of the basic files needed for a new Android application. It automates and simplifies the process of building our Android application. It provides an Android code editor that helps write valid XML for our Android manifest and resource files.

The Bluetooth in the mobile phone will get paired with the car key finder module. Next window will be displayed where there will be four modules which can be paired with the application. The Bluetooth device to be connected is listed window is shown in Fig. 3

Fig. 3 Bluetooth devices to be connected

B. Car Key Finder System

The mobile phone is paired with the Car Key Finder system. When the Device 1 is turned ON a Bluetooth signal is send from mobile application which is received by the Car Key Finder System and the Buzzer alarm is given so that the car key user can find his key within few seconds. The block diagram of the system is shown in Fig. 4

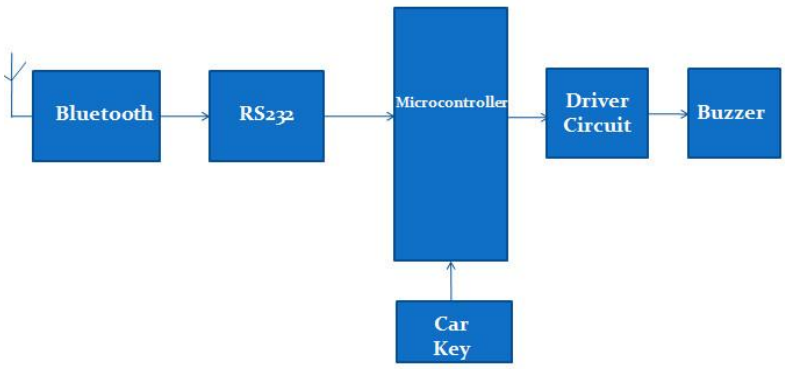

Fig. 4 Block diagram of Car Key Finder System

This system uses PIC16F877 Microcontroller. The hardware of the Car Key Finder system is shown in the Fig.5.

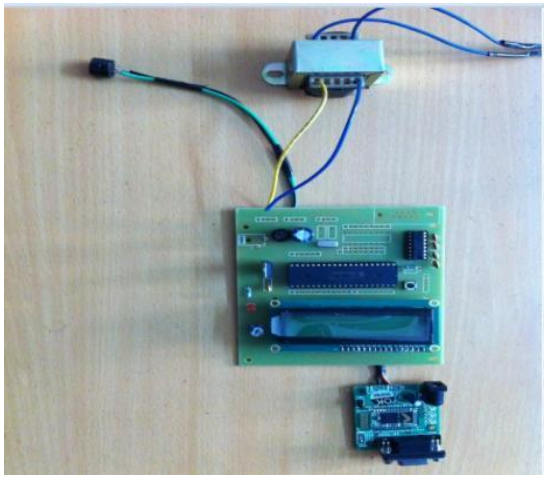

Fig. 5 Hardware of Car Key Finder System

C. Car Control System

The mobile Bluetooth is paired with the Car Control System. When the Device 1 is turned ON the car door is opened and if it is turned OFF the car door is closed. Similarly when the Device 2 is turned ON the Vehicle is ON and if it is turned OFF the Vehicle is OFF.

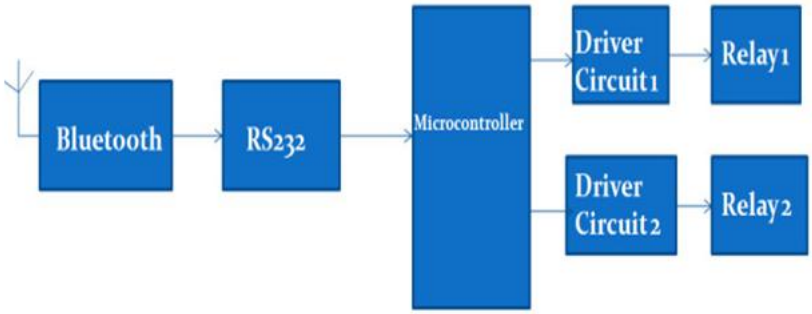

Fig. 6 Block Diagram of the Car Control System

The block diagram of the Car Control System is shown in Fig. 6. This system uses ARM LPC2148 Microcontroller. The hardware of the system is shown in Fig. 7

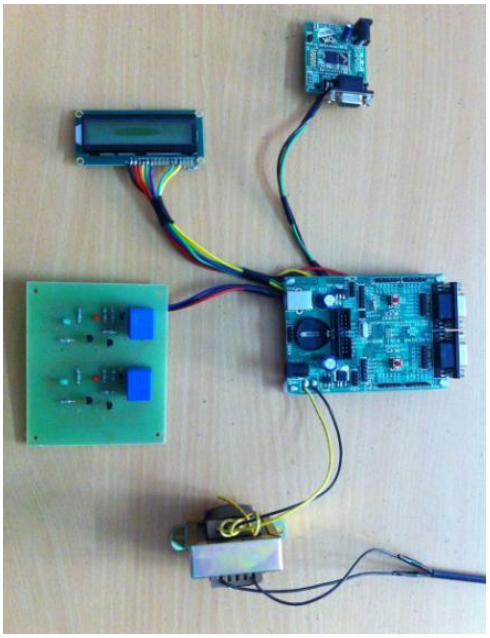

Fig. 7 Hardware of Car Control System

V. ARCHITECTURE OF THE SYSTEM

A. KEY FINDER ALGORITHM

Step 1: Include all the header files.
Step 2: Set the Pin 33 of the PIC Microcontroller as Buzzer
Step 3: Initialize the LCD and display it as **KEY FINDER**
Step 4: Initialize the serial communication
Step 5: If the value received is "**A**" the car key is found and the LCD displays **KEY DETECTED** else the LCD will display **FINDING KEY**

B. CAR CONTROL SYSTEM ALGORITHM

Step 1: Include all the header files and initialize all the variables.
Step 2: GPIO Port direction control registers 16th and 17th controlled pin is declared as output.
Step 3: Initialize the LCD and display it as **CREATOR**
Step 4: GPIO Port output set registers 16th and 17th is set as is produces high at the corresponding port pins.
Step 5: U1LSR is a read only register that provides status information on UART1 TX and RX. If the character is received the character is stored in data.
Step 6: If the received data is **A** the vehicle is on and the LCD displays **Vehicle ON**
Step 7: Else if the data is **a** vehicle is off and the LCD displays **Vehicle OFF**
Step 8: Else if the received data is **B** the vehicle door gets locked and the LCD displays **Door Lock**
Step 9: Else if the received data is **b** the vehicle is off and the LCD displays **Door Open.**

VI. EXPERIMENTAL RESULTS

Imagine the world with the vehicle ignition by using mobile Bluetooth technology will be a great advantage in terms of human energy and time consuming. It is indeed free of charge or no cost involved and can be activated in safe mode since the vehicle still in lock condition. Therefore, in this project an application will be implemented and developed for mobile phone car control system and car key finder system by using Bluetooth technology.

A. Car Key Finder System

Signal from the mobile using Bluetooth and is received by the Car Key Finder System and buzzer indication is given to the Car user. The LCD indicating the system is displayed in as shown in the Fig. 10

Fig. 10 LCD displaying Key Finder System

When the system is finding the car key the LCD indication is as shown in Fig. 11

Fig. 11 Key finder system displaying Finding Key using LCD

When the system finds the key the LCD indication is as shown in Fig. 12 along with the Buzzer indication. This system will save time of the car user instead of searching the misplaced key.

Fig. 12 LCD displaying Key Detected with Buzzer

B. Car Control System

The Fig. 13 and Fig. 14 shows the indication of the LCD when the car door is opened and closed respectively.

Fig. 13 LCD displaying Door Open

Fig. 14 LCD displaying Door Lock

The Fig. 15 and Fig. 16 shows the indication of the LCD when the vehicle is ON and OFF respectively.

Fig. 15 LCD displaying Vehicle On

Fig. 16 LCD displaying Vehicle Off

VII. CONCLUSION

Bluetooth based Secured Car Key Finder system is successfully implemented and its results are successfully verified. Car control operations such as Door Open, Door Close, Vehicle On, Vehicle Off and the vehicle key is also found with the indication of a Buzzer. Thus various mechanisms away from the vehicle are done using mobile Bluetooth technology with privacy and security.

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