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VEHICLE THEFT DETECTION AND REMOTE ENGINE LOCKING SYSTEM USING IOT

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ABSTRACT

In this project, we are taking GPS a step further and planning to track a vehicle using GPS Technology With just a few software and hardware adjustments, this vehicle tracking system can also be utilized as a soldier tracking system, accident detection alert system, and many other applications. Latitude and longitude (also known as GPS coordinates) are used in the process of tracking a vehicle. A location's value lies in its GPS coordinates. In essence, this system is embedded. Hardware that is managed by software is referred to as embedded. All the hardware elements in this setup are controlled by software using an Arduino. An integral component of the system is Arduino. Nearly everyone in society now owns a car, and theft occurs sometimes while driving and sometimes while parking. Vehicle safety is incredibly important for public transportation vehicles. The car has a locking and tracking mechanism to keep track of its location. Using the Global Positioning System (GPS) , the location of the car was determined. These devices continuously monitor a moving vehicle and provide status reports as needed. When a theft is discovered, the accountable party sends an SMS to the microcontroller, which subsequently sends control signals to turn off the engine. To restart the car and unlock the door, an authorized individual must send the controller the password.

There are so many recent technologies evolving and new methods are being upgraded to overcome this issue. This paper proposes a system presenting a mechanism to minimize vehicle thefts. The system provides security by sending an alert message as soon the vehicle is stolen or moved without knowledge of owner. System also offers location updates periodically to the registered user through internet of things. This provision for theft vehicle tracking is provided by GPS technology by sending location.

Keywords: GPS, Arduino, RFID, LCD, Buzzer, wi-fi module, Tampering Switch.

I. INTRODUCTION

1.1 INTRODUCTION

Microcontroller are widely used in Embedded Systems products. An Embedded product uses the microprocessor (or microcontroller) to do one task & one task only. A printer is an example of Embedded system since the processor inside it perform one task only namely getting the data and printing it. Although microcontroller is preferred choice

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for many Embedded systems, there are times that a microcontroller is inadequate for the task. For this reason, in recent years many manufactures of general-purpose microprocessors such as INTEL, Motorola, AMD & Cyrix have targeted their microprocessors for the high end of Embedded market. One of the most critical needs of the embedded system is to decrease power consumptions and space. This can be achieved by integrating more functions into the CPU chips. All the embedded processors have low power consumptions in additions to some forms of I/O, ROM all on a single chip. In higher performance Embedded system, the trend is to integrate more & more function on the CPU chip & let the designer decide which feature he/she wants to use.

1.2 EMBEDDED SYSTEM

Physically, embedded systems range from portable devices such as digital watches and MP3 players to large stationary installations like traffic lights, factory controllers, or the systems controlling nuclear power plants. Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a large chassis or enclosure

In general, "embedded system" is not an exactly defined term, as many systems have some element of programmability. For example, Handheld computers share some elements with embedded systems such as the operating systems and microprocessors which power them but are not truly embedded systems, because they allow different applications to be loaded and peripherals to be connected. Embedded systems span all aspects of modern life and there are many examples of their use. Telecommunications systems employ numerous embedded systems from telephone switches for the network to mobile phones at the end-user. Computer networking uses dedicated routers and network bridges to route data.

EXAMPLES OF EMBEDDED SYSTEM:

Automated teller. machines (ATMS). Integrated system in aircraft and missile. Cellular telephones and telephonic switches. Computer network equipment, including routers timeservers and firewalls. Computer printers, Copiers. Disk drives (floppy disk drive and hard disk drive). Engine controllers and antilock brake controllers for automobiles. Home automation products like thermostat, air conditioners sprinkles and security monitoring system. House hold appliances including microwave ovens, washing machines, TV sets DVD layers/recorders. Medical equipment. Measurement equipment such as digital storage oscilloscopes, logic analysers and spectrum analysers. Multimedia appliances: internet radio receivers, TV set top boxes.Small hand-held computer with P1M5 and other applications. Programmable logic controllers (PLC’s) for industrial automation and

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monitoring. Stationary video game controllers.

1.3 CHARACTERISTICS:

Embedded systems are designed to do some specific tasks, rather than be a general-purpose computer for multiple tasks. Some also have real-time performance constraints that must be met, for reasons such as safety and usability; others may have low or no performance requirements, allowing the system hardware to be simplified to reduce costs. Embedded systems are not always standalone devices. Many embedded systems consist of small, computerized parts within a larger device that serves a more general purpose.For example, the Gibson Robot Guitar features an embedded system for tuning the strings, but the overall purpose of the Robot Guitar is, of course, to play music. Similarly, an embedded system in an automobile provides a specific function as a subsystem of the car itself.

The software written for embedded systems is often called firmware, and is usually stored in read- only memory or Flash memory chips rather than a disk drive. It often runs with limited computer hardware resources: small or no keyboard, screen, and little memory.

1.4 MICROPROCESSOR (MP):

A microprocessor is a general-purpose digital computer central processing unit (CPU). Although popularly known as a “computer on a chip” is in no sense a complete digital computer.

The block diagram of a microprocessor CPU is shown, which contains an arithmetic and logical unit (ALU), a program counter (PC), a stack pointer (SP), some working registers, a clock timing circuit, and interrupt circuits.

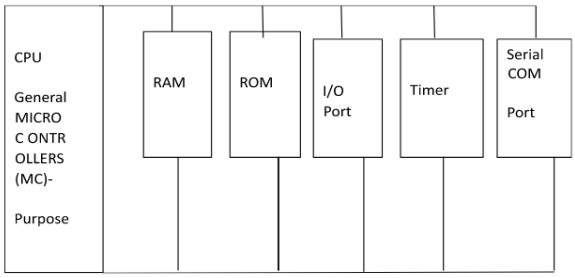

Fig 1.1 Block diagram of microprocessor

1.5 MICROCONTROLLER (MC):

Figure shows the block diagram of a typical microcontroller. The design incorporates all of the features found in micro-processor CPU: ALU, PC, SP, and registers. It also added the other features needed to make a complete computer: ROM, RAM, parallel I/O, serial I/O, counters, and clock circuit.

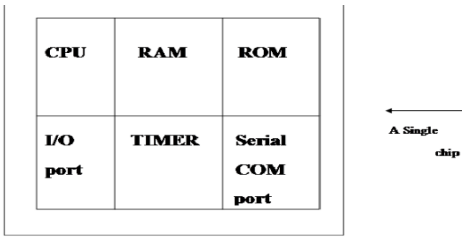

Fig 1.2 Microcontroller

1.6 COMPARISION BETWEEN MICROPROCESSOR AND MICROCONTROLLER

The microprocessor must have many additional parts to be operational as a computer whereas microcontroller requires no additional external digital parts.

The prime use of microprocessor is to

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read data, perform extensive calculations on that data and store them in the mass storage device or display it. The prime functions of microcontroller is to read data, perform limited calculations on it, control its environment based on these data. Thus the microprocessor is said to be general-purpose digital computers whereas the microcontroller are intend to be special purpose digital controller. Microprocessor need many opcodes for moving data from the external memory to the CPU, microcontroller may require just one or two, also microprocessor may have one or two types of bit handling instructions whereas microcontrollers have many.

II. LITERATURE SURVEY

2.1 INTRODUCTION

The vehicle theft is become a major problem that the entire world is facing now. The issue of vehicle theft has increased tremendously,
mostly at parks. To stopping this issue, there is a need of theft alerts system which helps to owner to ensure theft prevention and provide speedy identification of an unauthorized person who was trying to steal the vehicles. The theft alert system makes a use of GPS (Global Positioning System) which are embedded in vehicle to communicate with vehicle's owner mobile phone.

The GPS technology is used here to provide the exact location of target.It means that whenever any unauthorized person will try to steal our vehicles, then we can easily detect the location of theft with vehicle by using the application of GPS technology. In this system we are going to use two keys to open the vehicle lock, one is the owner's key which is
used by owner and other is direct key which is used by unauthorised person. Whenever the direct key is used,the alarm become active and give the beep sound which indicate that the thief is detected.

At the same time a warning SMS is sent to registered mobile number. After receiving the message, the vehicle's ownersent a message to remotely locked the engine, after turning off the engine, the motor cannot start without permission of password. In this way, this system helps in preventing the criminals from stealing vehicles.

III. PROBLEM STATEMENT

Manual Tracking: Traditional methods involve manual tracking and reporting of stolen vehicles..

Basic GPS Systems: Some vehicles use basic GPS systems for location tracking, but these lack real-time alert capabilities and integration with GSM for communication

3.1 DISADVANTAGES OF EXISTING SYSTEM

Delayed Response: Manual tracking and basic GPS systems do not provide immediate alerts, leading to delays in theft detection and recovery. Limited Functionality: Basic systems do not offer comprehensive features like engine shutdown or real-time location

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updates. High Cost: Advanced tracking systems can be expensive and not accessible to all vehicle owners.

IV. PROPOSED SYSTEM

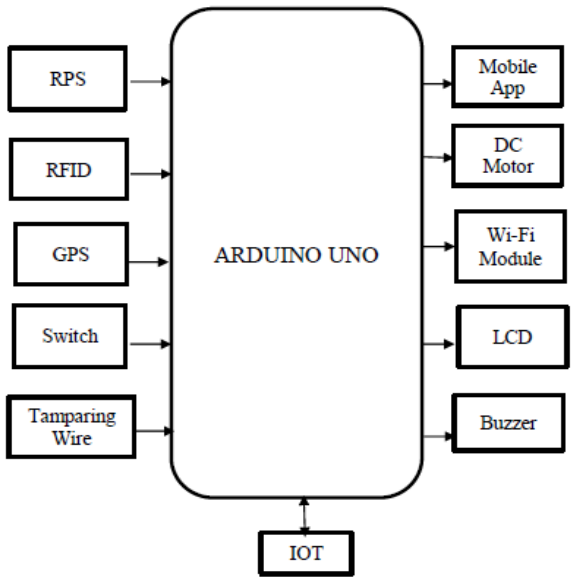
• **GPS Integration:** Combines GPS for location tracking for communication to provide real-time updates and alerts.

• **Embedded System:** Uses Arduino to control hardware components and manage the system.

• **Theft Detection and Prevention:** Sends an SMS alert to the owner and shuts down the engine if theft is detected. The vehicle can only be restarted with an authorized password.

• **Periodic Location Updates:** Provides continuous monitoring and periodic location updates to the registered user through IoT.

4.1 BLOCK DIAGRAM OF PROPOSED SYSTEM



V. BLOCK DIAGRAM OF PROPOSED SYSTEM

HARDWARE COMPONENTS

The following hardware tools used in the proposed system

Power Supply, Arduino UNO, RFID, GPS, Switch, Tamparing Wire, DC Motor, Wi-Fi, LCD, Buzzer

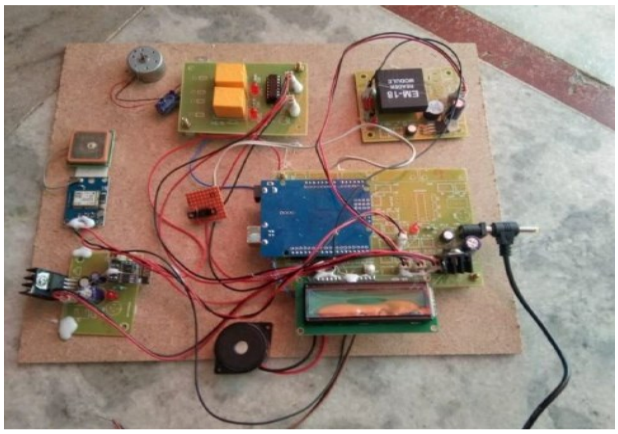
SOFTWARE COMPONENTS

The following software tools used in the proposed system : Arduino IDE, Proteus Design Tool

TECHNOLOGY USED

IOT

VI. RESULT AND DISCUSSION



This is our project, which involves a Arduino Uno microcontroller-based system featuring an LCD display, Buzzer, RFID Module, GPS Module, Tampering Switch and power supply. It is designed for automation and monitoring purposes, possibly in an IoT application

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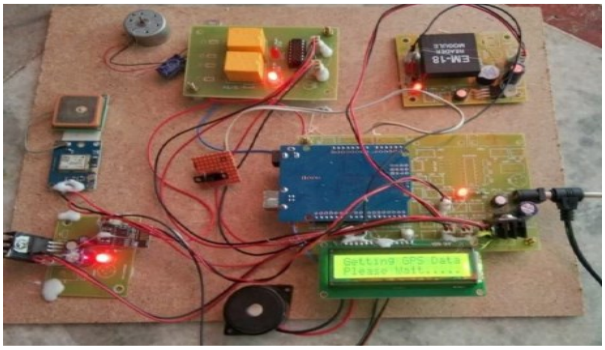
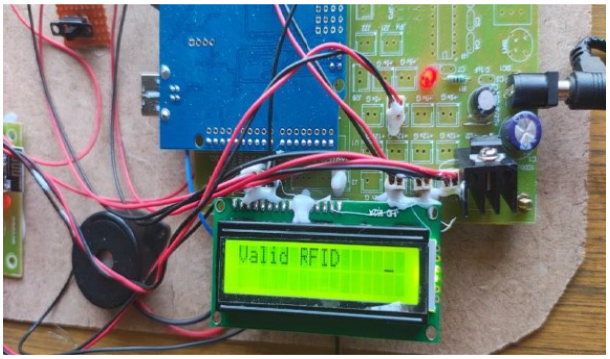
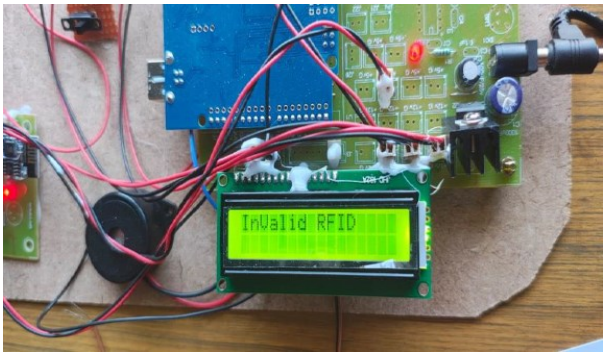
Open the Telnet app.Once installed, tap Open or find the app on your home screen/app drawer. Connect to a Telnet server. Enter the host IP address and port (usually port 23 for Telnet), then tap Connect.



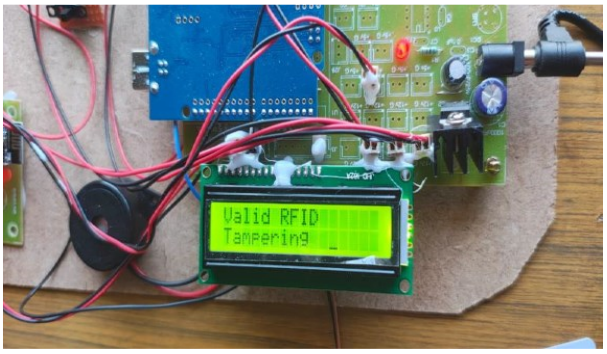
When the kit is powered on, the LCD displays "GPS connection, please wait.Once connected, it will show the latitude and longitude values



When a valid RFID tag is scanned, the LCD will display 'Valid RFID', the buzzer will turn off, and the motor (or engine) will turn on. At the same time, a message saying 'Valid RFID' will be sent to the mobile app.



When an invalid RFID tag is scanned, the LCD will display 'Invalid RFID', the buzzer will turn on, and the motor (or engine) will remain off. At the same time, a message saying 'Invalid RFID' will be sent to the mobile app



If we do not have the RFID card and attempt to short-circuit or tamper with the LCD display to simulate a valid RFID scan, the system will detect the tampering. As a result, the buzzer and motor will be activated, and a notification message will be sent to the mobile app

VII. CONCLUSION

The design and implementation of this system allows safety and security to the vehicles. A simple, cost efficient anti-theft security system has been successfully designed. This system helps in tracking exact position of target (vehicle stole by thief) as well as in locking the vehicle through SMS in perspectiv e of remote

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control. All these functions achieved by GPS. This system also helps in detection of an accident and send information to the vehicle's owner. The technologies of speed, the GPS wireless transmission have good perspective in the safety domain's application. The advantage of this system is that it prevents criminal from stealing vehicles very effectively. In addition to this, this system reduced the accidents and save the human lives. This system can be implemented in real time.

REFERENCE

1. Anusha, T., & Sivakumar, T. (2012). Vehicle Identification and Authentication System. International Journal of Engineering Science and Advanced Technology (IJESAT)

2. Ashad, M., Hassan, J., Mohtashim, B., Rameez, A. K., Zeeshan, M. Y., Zeeshan R. & Safdar, K. (2012). Vehicle Intrusion and Theft Control System using GSM and GPS: An Advance and Viable Approach. Asian Journal of Engineering, Science and Technology (AJEST),

3. Awotunde J.B., Adewunmi-Olowabi, F.T., Owolabi, A.A. &Akanbi, M.B. (2014). Automated.

4. A. Saad and U. Weinmann, Automotive software engineering and concepts, Jahrestagung, vol. 34, pp. 318-319, 2003. Gl.

5. E. Nickel, -IBM automotive software foundry. in Proc. Conf. Comput. Sci. Autom. Ind., Frankfurt, Germany, 2003.

6. M.Wolf. A. Weimerskirch, and T. Wollinger, -State of theart: Embedding security in vehicles, EURASIP J. Embedded Syst., vol. 2007, no. 5, p. 1. 2007.

7. R. Charette, This Car Runs on Code. [Online]. Available: http://www.spectrum.ieee.org/feb09/7649

8. T. Nolte, H. Hansson, and LL Bello, Automotive communications past, current and future, in Proc. IEEE Int. Conf. Emerging Technol. Factory Autom., 2005, vol. 1, pp. 992-999