International Journal of Engineering Research and Science & Technology

IJERST

ISSN : 2319-5991

www.ijerst.com

Email: editor@ijerst.com or editor.ijerst@gmail.com

ISSN 2319-5991 www.ijerst.com
Vol. 17, Issue.2, April 2024

FINGERPRINT BASED VEHICLE ANTI-THEFT SECURITY SYSTEM AND VEHICLE IGNITION WITH LOCATION TRACKING

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ABSTRACT

The "Fingerprint-Based Vehicle Anti-Theft Security System with Vehicle Ignition and Location Tracking" project presents an advanced and secure solution for vehicle protection and tracking. Employing cutting-edge technology such as fingerprint sensors, Arduino microcontrollers, GPS, and GSM modules, this system offers robust anti-theft security and real-time vehicle monitoring. Vehicle theft is a pervasive issue, and traditional security measures often fall short. This project addresses the problem by introducing biometric fingerprint recognition as a key security feature. To start the vehicle, the owner's fingerprint must be authenticated, making it nearly impossible for unauthorized individuals to operate the vehicle. Additionally, the system incorporates GPS and GSM technology to enable real-time vehicle tracking. Owners can monitor their vehicle's location remotely using a dedicated application or by sending SMS commands. This not only enhances security but also provides valuable information for logistics and fleet management. The "Fingerprint-Based Vehicle Anti-Theft Security System" project exemplifies the potential of biometrics and IoT technology in the automotive sector. By combining fingerprint recognition with GPS and GSM, it offers a comprehensive solution that ensures both vehicle security and location tracking. This project aligns with the increasing demand for advanced vehicle security systems that leverage biometrics and remote monitoring, contributing to safer and more secure transportation.

International Journal of Engineering Research and Science & Technology

ISSN 2319-5991 www.ijerst.com
Vol. 17, Issue.2, April 2024

INTRODUCTION

Recently while discussing about Biometrics we are concentrating on Fingerprint scanning. For this we are using FIM 3030N high voltage module as a scanner. In this we can store up to 'n' no of users fingerprints. This module can operate in 2 modes they are Master mode and User mode. We will be using Master mode to register the fingerprints which will be stored in the ROM present on the scanner with a unique id. When this module is interfaced to the Arduino, we will be using it in user mode. In this mode we will be verifying the scanned images with the stored images. When coming to our application the images of the citizens will be stored in the module with a unique id. Citizens have to scan their image on demand by police, which is then verified with the image present in fingerprint module and their record will be updated. This scanner is interfaced to Arduino through enabling serial communication. By using this controller we will be controlling the scanning process. After the scanning has been completed the result is stored in the controller. By simply pressing a switch we can get the details of the person. The vehicle tracking system is designed and Implemented for tracking the movement of any equipped vehicle from any location at any time. The designed in-vehicle device works using global positioning system and global system for mobile (GSM) communication/general packet radio service (GSM/GPRS) technology .the device is embedded inside a vehicle whose position is to be determined and tracked in real time. A microcontroller is used to control the GSM and GSM/GPRS modules. GPS modules get geographic coordinates at regular interval of time and GSM/GPRS module is used to transmit and update the vehicle location to the database. A GPS tracking unit is a device that uses the Global Positioning System to determine the precise location of a vehicle, person, or other asset to which it is attached and to record the position of the asset at regular intervals. The recorded location data can be stored within the tracking unit, or it may be transmitted to a central location data base, or internet-connected computer, using a cellular (GPRS).This allows the asset's location to be displayed against a map backdrop either in real-time or when analyzing the track later, using customized software. The prevention of the vehicle from probable theft is the main aim of the project. To achieve this we are incorporating security by including biometrics, i.e a fingerprint.

In the beginning the owner of the vehicle must store his/her own fingerprint in the finger print module. The GSM modem is used to send and receive messages to and from the owner. The owner's mobile number has to be set fixed during the coding. To start the ignition of the four- wheeler one should enter the authorized fingerprint. If anyone enters an unregistered

ISSN 2319-5991 www.ijerst.com
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fingerprint, the owner will immediately receive a message and the local alarm system will be turned on. For theft prevention, we can also trace the four-wheeler by giving a call to the GSM modem which is embedded on the system. Then real time tracking begins and the GPS location of the vehicle is sent to the owner by SMS. The ignition of the vehicle can also be controller through notifications to the systems.

OBJECTIVE OF THE PROJECT

The primary objective of this project is to Design a Vedic Multiplier using the Xilinx Vivado Software and Verilog Hardware Description Language(HDL). Multipliers are important block in digital systems and play a critical role in digital designs. Along with accuracy demand for minimizing time area, power, and delay of the processor by enhancing speed is the focus point. This Project also Focusses on selecting an Efficient Adder for the Multiplier by Comparing Ripple carry and Parallel Prefix Adders. Vedic mathematics rules and Algorithms generate partial products concurrently and save time.

LITERATURE SURVEY

In modern days a vehicle anti-theft system is of prime importance. Currently public having an own vehicle, theft is finding on parking and sometimes during insecurity places. The safe of vehicle is extremely essential for public vehicles. The first layer of protection in the system is a Fingerprint recognition, based on which the locks are opened. The Fingerprint matching is done by utilizing the minutiae based Fingerprint recognition scheme. The vehicle is became on only with the bike key. One turned on the user should keep them finger to the fingerprint sensor. If the finger ridges match, Solenoid value is opened for fuel supply and also a message is sending to the user by using GSM [Global System for Mobile Communication]. If finger matches failed, it will result in vehicle getting immobilized and an alert message is sent to the mobile number of the owner. The seized vehicle can be tracked using a GSM which is also being attached. If the vehicle (or) bike is stolen by some person. The place of vehicle is identified by GPS tracker, when the theft identified. The responsible person send SMS to the ARM, then ARM issue the control signals to stop the engine motor. Authorized person want to send the password to controller to restart the vehicle and open the solenoid valve and Keil μ-vision software is used for program coding. This is more secured, reliable and low cost. The experimental results proved the functionality of the anti-theft system in working environment.

Karan Siyal and G. Gugapriya “Anti-Theft Vehicle Locking System using CAN” As an

ISSN 2319-5991 www.ijerst.com
Vol. 17, Issue.2, April 2024

advancement in automobile industry, real time vehicle safety technology has arrived a long way. Vehicles become very essential part of human life hence vehicle's safety is priority
for its owner. Nowadays vehicle theft can happen anytime from anywhere such as common parking areas and some of the instable places. This paper is aimed for a novel Anti-Theft Vehicle Locking System .Here, with high speed reliable Control Area Network (CAN), a sensor based mechanism is interfaced with Engine Control Module (ECM) using ARM7 TDMI microcontroller. In order to prevent vehicle from theft fuel flow sensor observes ignition of engine and attached GSM sends an alert message to owner. In case of stolen, real time vehicle tracking with global positioning system enables owner to control the engine with mobile phone so vehicle will not work any longer.

PROPOSE SYSTEM

An Embedded System is a combination of computer hardware and software, and perhaps

additional mechanical or other parts, designed to perform a specific function. A good example is the microwave oven. Almost every household has one, and tens of millions of them are used every day, but very few people realize that a processor and software are involved in the preparation of their lunch or dinner.

This is in direct contrast to the personal computer in the family room. It too is comprised of computer hardware and software and mechanical components (disk drives, for example). However, a personal computer is not designed to perform a specific function rather; it is able to do many different things. Many people use the term general-purpose computer to make this distinction clear.

As shipped, a general-purpose computer is a blank slate; the manufacturer does not know what the customer will do wish it. One customer may use it for a network file server another may use it exclusively for playing games, and a third may use it to write the next great American novel. Frequently, an embedded system is a component within some larger system. For example, modern cars and trucks contain many embedded systems. One embedded system controls the anti- lock brakes, other monitors and controls the vehicle's emissions, and a third displays information on the dashboard. In some cases, these embedded systems are connected by some sort of a communication network, but that is certainly not a requirement.

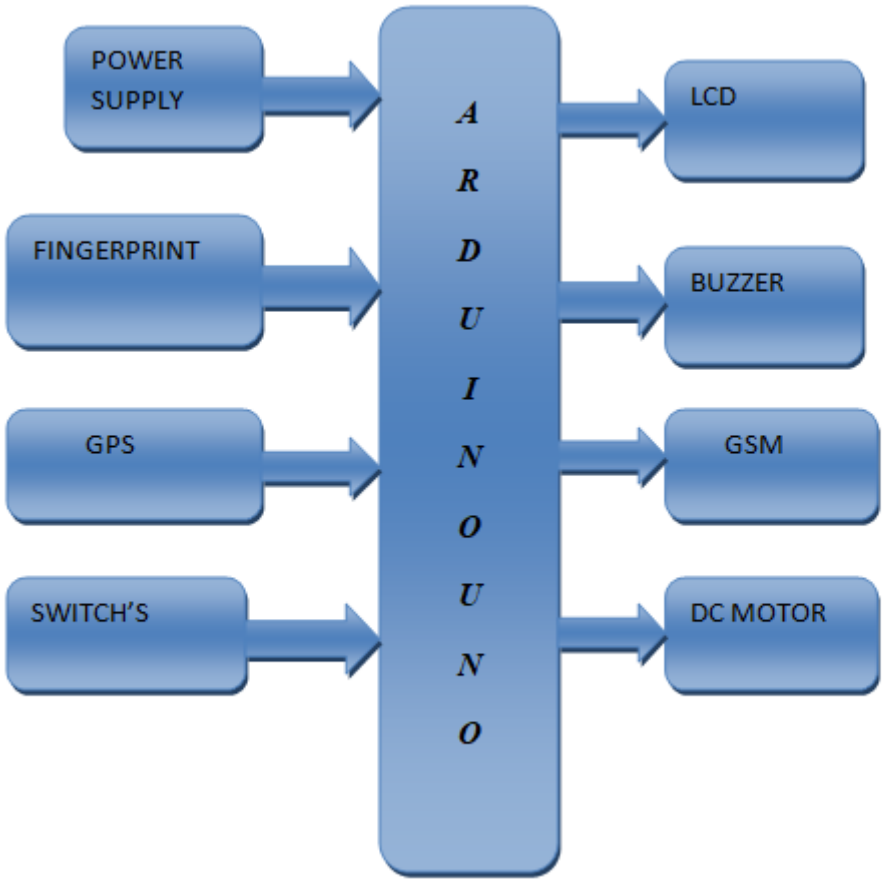
At the possible risk of confusing you, it is important to point out that a general-purpose

International Journal of Engineering Research and Science & Technology

ISSN 2319-5991 www.ijerst.com
Vol. 17, Issue.2, April 2024

computer is itself made up of numerous embedded systems. For example, my computer consists of a keyboard, mouse, video card, modem, hard drive, floppy drive, and sound card-each of Which is an embedded system? Each of these devices contains a processor and software and is designed to perform a specific function. For example, the modem is designed to send and receive digital data over analog telephone line. That's it and all of the other devices can be summarized in a single.

BLOCK DIAGRAM



Block diagram

International Journal of Engineering Research and Science & Technology

ISSN 2319-5991 www.ijerst.com
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RESULTS

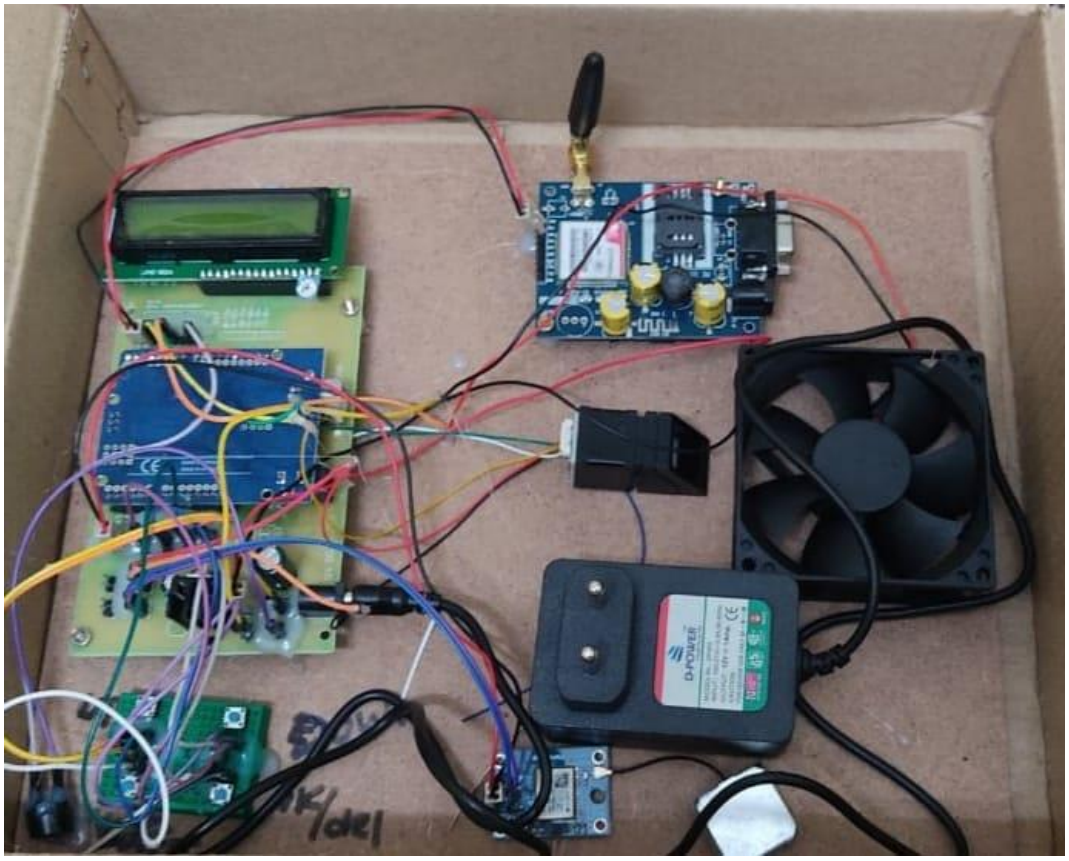

FIG No .1. finger print based vehicle anti-theft security system and vehicle ignition kit.

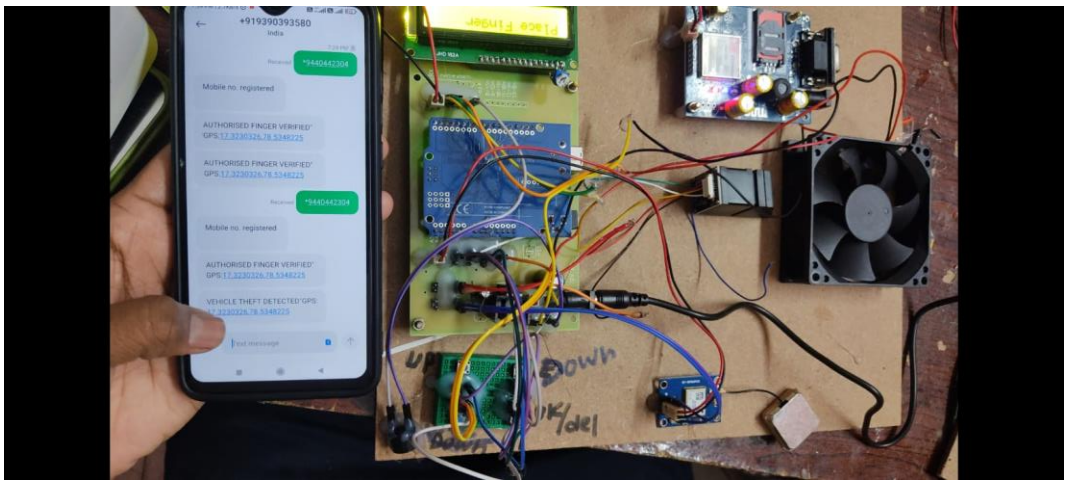

Fig no. 6. output

ISSN 2319-5991 www.ijerst.com
Vol. 17, Issue.2, April 2024

ADVANTAGES

- Enhanced security
- Theft prevention
- Real-time tracking
- User convenience
- Customizable security

APPLICATIONS

- Automotive security
- Fleet management
- Rental services
- Commercial use
- Emergency services

- Government/military application
- CONCLUSION

In this paper an alternative approach for device switching which combines fingerprint identification technique with GSM and GPS functionalities has been proposed. This approach allows more than one person to control the device functionality and the authentication facility provided by the fingerprint sensor helps to reduce the fault correction time. The Arduino board used in this model is least expensive and can be implemented in various applications. The application of device switching is not limited to control device from a long distance, but it can also be used in automobile applications. The proposed design not only provides switching functionality, but also provides the exact location of the device. Hence theft of the device can easily be detected. It gives complete knowledge of designing microcontroller based system and developing embedded software. In the future work cloud computing can be included to this project so that every activity performed on the device can be closely monitored. This reduces the need for storing all the log-in information in the computer storage.

FUTURE SCOPE

The future scope of a fingerprint-based vehicle anti-theft security system, coupled with vehicle ignition control and location tracking, is poised for substantial advancements across multiple fronts. Anticipated innovations in biometric technology include the integration of multimodal biometrics and behavioral biometrics, enriching the authentication process. Artificial intelligence (AI) and machine learning (ML) are expected to play a pivotal role, enabling dynamic authentication and advanced anomaly detection. Cybersecurity enhancements may involve the incorporation of blockchain for secure data management and the implementation of cutting-edge encryption standards. The integration of such systems with

ISSN 2319-5991 www.ijerst.com
Vol. 17, Issue.2, April 2024

smart city infrastructure is on the horizon, fostering collaboration with traffic management and emergency services. As autonomous vehicles become more prevalent, the security system's adaptation to their unique challenges, such as cybersecurity threats and biometric driver monitoring, will be imperative. Seamless integration with smart devices, including voice and gesture controls, is envisioned to enhance user experience. Considerations for environmental sustainability, such as energy-efficient solutions and the use of recyclable materials, are expected to gain prominence. Global standardization, compliance with evolving regulations, and continuous research and development efforts will collectively shape the future trajectory of fingerprint-based vehicle security systems, ensuring they remain at the forefront of innovation, user satisfaction, and security resilience.

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