

FINGERPRINT STARTER VEHICLE

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ABSTRACT- The fingerprint vehicle starter project aims to increase the security of vehicles by using biometric authentication technology. Biometrics system can be used as a good and effective security option. An important and very reliable human identification method is fingerprint identification. Vehicle safety has become a serious problem as the frequency of crime has increased. Vehicle keys are a big concern these days since they are easily forgotten or lost when carried. At start, this technology lets the customer to authenticate by scanning their unique fingerprint. The system uses a fingerprint scanner to identify the authorized user of the vehicle, allowing them to start the engine. This project is designed to prevent car theft and improve user convenience, as drivers will not need to carry keys with them. The system allows multiple users to register as authorized users. When into monitoring mode, the system checks for users to scan. On scanning, the system checks if user is authorized user. The system is implemented using an Arduino microcontroller and a fingerprint sensor module, which communicate with the vehicle's ignition system. The project's success is evaluated based on its accuracy in identifying the authorized user and its reliability in preventing unauthorized access to the vehicle. This project has the potential to significantly improve vehicle security and enhance user experience. This provides safe and worry-free way to begin the engine or automobile. The fingerprint vehicle starter project aims to increase the security of vehicles by using biometric authentication technology. Biometrics system can be used as a good and effective security option. An important and very reliable human identification method is fingerprint Identification.

Keywords – Fingerprint Starter vehicle

INTRODUCTION: Vehicles have been used in one form 'Bio' and 'Metrics' where 'Bio' means 'life' and or other since the invention of wheel. With the invention of 'Metrics' means 'to measure'. The four major wheel, came in the 2nd most advanced technology, The methods used in Biometrics are: Palm, Fingerprint, Steam Engine. With the development of steam engine Iris, Voice, Face etc. There are many more methods, vehicle took the form of what we see today. In earlier times but these four are the most important. Biometrics is crank shaft mechanism were used to ignite the vehicle. used in Schools, Banks, Colleges, and Universities Leaving that conventional method behind came in the etc. One of the growing industries is the automotive concept of igniting the vehicles using key. And now, Keys industry. One of the first companies to introduce are being replaced by Push start buttons. This project was finger print recognition in cars was Mercedes, which started with the sole purpose of eliminating keys as was then followed by Volkswagen. But now a day's conventional method of starting the vehicle. With the almost all the car makers are implementing Biometric introduction of Biometrics in the 18th century, security based Security. Fingerprint sensors are quite cheap in advancement in technology has gone up to various levels. comparison to other Biometric sensors. And they are In the 18th century it was used to verify the employees relatively easier to maintain also. The reason for working for the British Empire. Since then Biometrics has going into biometrics is that its chances of being taken its toll. Biometrics is formed from the Greek words duplicated are very less.

There two Main purpose for this project. First being the eliminating the use of key completely for igniting the vehicle.

Fingerprint recognition technology allows access to only those whose fingerprints that are Stored in the memory. Stored fingerprints are retained even in the event of complete power failure or Battery drain. These eliminates the need for keeping track of keys or remembering a combination Password, or PIN. It can only be opened when an authorized user is present, since there are no keys or Combinations to be copied or stolen, or locks that can be picked. The fingerprint based lock therefore Provides a wonderful solution to conventionally encountered inconveniences. This report focuses on the Use of fingerprints to unlock locks, as opposed to the established method of using keys.

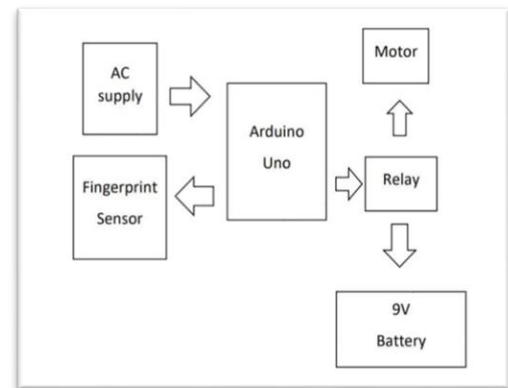
The proposed reliable and robust design of Two Wheeler Vehicle Security System (TWVSS) with features enhancing the security of the vehicle and ensuring the safety of the rider. Fingerprint matching techniques are of two types: graph based and minutiae based. The template size of the biometric information based on minutiae is much smaller and the processing speed is higher than that of graph-based fingerprint matching . In recent years, the automotive industry has witnessed significant advancements in vehicle security systems, aiming to combat the rising concerns of theft and unauthorized access. One emerging technology that has garnered attention is the Fingerprint Vehicle Starter. This innovative system replaces traditional keys or keyless entry systems with fingerprint recognition, offering a secure and personalized approach to vehicle access.

LITERATURE REVIEW :

Methodology: In his paper basically focuses on the replacement of keys with the biometric specially fingerprint based lock systems in the vehicles because fingerprints are the oldest and most widely used form of biometric identification and also provide a robust security mechanism for various security domains. Their prototype consists of fingerprint software module used to store the database of the valid users, a hardware unit for interfacing and the ignition system module to ignite the vehicle. Database of the valid users is stored in the module. Now when a person tries to operate the vehicle then the CPU matches the fingerprint of the person with the stored database if the match result is successful then the vehicle is ignited and otherwise not. External devices (hardware) can be controlled through the PC parallel port. The parallel port is a simple and inexpensive tool for building

computer controlled devices and projects. It is often used in computer controlled robots, Atmel/PIC programmers.

METHODOLOGY : We realizing a project physically have lots to do with research, choice of component and testing of the components. The project was implemented and tested to ensure proper



The project was implemented and tested to ensure proper operation under stated instruction. The various modules were tested and satisfactory results were obtained. As the components used fall within the tolerance value of the components, hence an assurance of the proper functioning of the system. it shows that the designed system performs the measured values The block diagram illustrates the flow of information and control within the Fingerprint Vehicle Starter project. The driver places their finger on the Fingerprint Sensor, which captures their fingerprint data. This data is then transmitted to the Control Unit for processing. The Control Unit compares the captured fingerprint against stored templates to authenticate the driver's identity. If the fingerprint matches an authorized user, the Control Unit sends a signal to the Vehicle Ignition System, enabling the engine to start. 9V Battery Arduino Uno Relay Motor AC supply Fingerprint Sensor 21 It's important to note that the block diagram provides a high-level overview and may not capture all the intricacies and subsystems involved in a real-world implementation of a Fingerprint Vehicle Starter project. However, it outlines the key components and their interactions to give a general understanding of the system's architecture. When enrolling, user needs to enter the finger two times. The system will process the two-time finger images, generate a template of the finger based on processing results and store the template. When matching, user enters the finger through optical sensor and system will generate a template of

WORKING:

The finger and compare it with templates of the finger library. For 1:1 matching, system will compare the live finger with specific template designated in the Module; for 1: N matching, or searching, system will search the whole finger library for the matching finger. In both circumstances, system will return the matching result, success or failure. Fingerprint Sensor: The Fingerprint Sensor is the primary input component of the system. It captures the driver's fingerprint data when they place their finger on it. This sensor is strategically positioned within the vehicle, typically near the steering wheel or door handle, for easy access. Control Unit: The Control Unit is responsible for processing and verifying the fingerprint data captured by the sensor. It compares the captured fingerprint against pre-stored fingerprint templates to authenticate the user's identity. The Control Unit may also include additional functionalities, such as data storage and signal processing algorithms.

Fingerprint sensor:

Fingerprint sensor R306 module. It consists of an optical fingerprint sensor and high-speed DSP processor. Also this module consists of the high performance fingerprint alignment algorithm this algorithm helps the module for the simple entry of the fingerprint and its matching. This hardware consists of the high capacity FLASH chips, hardware and software Fingerprint Sensor Needs Higher Voltage Some high-end sensors or display modules might need more than the battery's voltage.



ARDUINO UNO: Arduino Uno is a circuit board which has Arduino Ide. These two together gives the user to embed various codes for achieving their goal. This Arduino Ide uses the embedded C language. Together they are capable of reading analog or 27 digital input signals from

different sensors, activating the motor, turning LED on/off and do many other such activities. All these functionalities are performed by sending a set of instructions to the ATmega328 main microcontroller, on the board via Arduino ID.

Relay:

Relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts, or combinations thereof relays are used where it is necessary to control a circuit by an independent low-power signal, or where 33 several circuits must be controlled by one signal.

DC motor:

DC motors, as the name implies, operate with terminal voltage and current that is "direct", or substantially constant. While it is possible to produce a "true DC" machine in a form usually called "acyclic", with geometry, such machines have very low terminal voltage and consequently high terminal current relative to their power rating. Thus all application of DC motors have employed a mechanical switch or commutator to turn the terminal current, which is constant or DC, into alternating current in the armature of the machine. A DC motor is any of a class of rotary electrical motors that converts direct current (DC) electrical energy into mechanical energy.

Step up Booster:



Fingerprint and RFID modules often require specific, stable operating voltages (e.g., 3.3V, 5V, or even 12V), but vehicles have a fluctuating power supply (usually 12V nominal, but can drop during engine cranking or spike during alternator operation).

Fingerprint Sensor Needs Higher Voltage

- Some high-end sensors or display modules might need more than the battery's voltage.
- A boost converter is used to raise 5V to 12V or other required levels.

FEATURES:

Biometric Authentication: Uses fingerprint recognition to start the engine. Only authorized users (whose fingerprints are enrolled) can operate the vehicle.

Keyless Ignition: Eliminates the need for physical keys or key fobs. Convenient and fast start process with just a fingerprint scan.

Multi-User Support: Can store multiple fingerprints (e.g., for family members or fleet drivers). Each user can have separate access permissions.

Emergency Override (Optional):

In case of sensor failure or emergency, may include:

A PIN code, RFID backup.

FUTURE SCOPE:

In future work, we will propose a design of a FINGERPRINT based micro drone with multiple frequencies and to add a micro camera in order to capture the image in front of it and process the image using image processing and identify the related bird / rodent and play the

respective frequency in order to get rid of them. This can also be implemented in other automobiles apart from cars. Others types of bio-metrics can also be used.

RESULT:

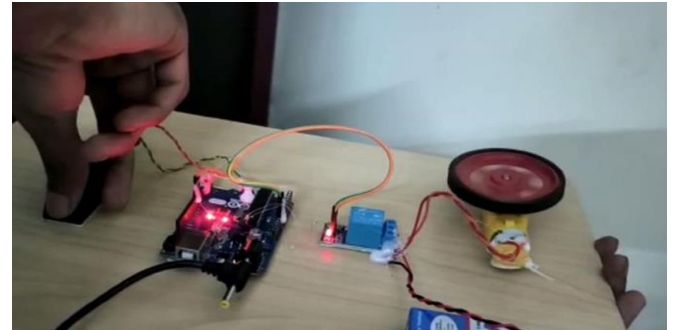


Fig.Finger Print Vehicle Starter

CONCLUSION

This vehicle ignition is highly affected in case the registered user finger is defaced or defected or colored, the system won't allow the user to ignite the vehicle. To overcome this limitation we need to add on other features such as it scans the iris or heartbeat of the concerned user and after that it allows permissibility to the user, which would enhance the level of security up to a new apex. Our proposed works deals with the project in 2 modules that consists of an LCD crystal display which shows and display the value and the other one it comprises of fingerprint sensor which takes input from the user side. The results and observation described in the previous section assures the optimal and working results generated by the system. It improves the existing system by reducing the cost of the existing and overcoming the conventional system. As an application of it we can implement the same basic concept in other domains also, which requires more security from thefts such as authorized user entry only, verified users access in unauthorized regions only. Addition of more functionality would make it useful to applied in domains also. The fingerprint vehicle starter system offers a secure and convenient alternative to traditional key-based vehicle access. By leveraging biometric authentication, this system ensures that only authorized individuals can start the vehicle, enhancing overall security. While challenges related to accuracy, integration, and user management

may arise, overcoming them can lead to an improved and widely applicable solution.

REFERENCES:

- I. Omidiora E. O.(2011) “A Prototype of a Fingerprint Based Ignition Systems in Vehicles” Published in European Journal of Scientific Research ISSN 1450- 216X Vol.62 No.2 (2011), pp. 164-171 © Euro Journals Publishing, Inc. 2011.
- II. Karthikeyan.a “ Fingerprint Based Ignition System” Published in Karthikeyan.a, Sowndharya.j /International Journal Of Computational Engineering Research / ISSN: 2250–3005
- III. Prashantkumar R.(2013) “Two Wheeler Vehicle Security System” Published International Journal of Engineering Sciences & Emerging Technologies, Dec. 2013. ISSN: 2231 – 6604 Volume 6, Issue 3, pp: 324-334 ©IJESET
- IV. Pandit VR, Joshi KA, Bawane NG. ATM Terminal Security using Fingerprint Recognition. 2013.
- V. Pingat S, Rakhecha S, Agrawal R, Mhetre S, Raushan P. Real Time Smart Car Security System by Using Biometrics. International Journal of Innovative Technology and Exploring Engineering (IJITEE). 2013.
- VI. Sasi A, Nair LR. Vehicle Anti-theft System Based on an Embedded Platform. International Journal of Research in . Mudholkar SS, Shende PM, Sarode MV. Biometrics Authentication Technique for Intrusion Detection
- VII. Systems Using Fingerprint Recognition. International Journal of Computer Science, Engineering and Information Technology (IJCSEIT), 2012; 2(1). 53
- VIII. Omidiora E, Fakolujo O, Arulogun O, Aborisade D. A Prototype of a Fingerprint Based Ignition Systems in Vehicles. European Journal of Scientific Research2011.
- IX. Thai R. (2003) “Fingerprint Image Enhancement and Minutiae Extraction“, Unpublished B.ScThesis, School ofComputerScienceandSoftwareEngineering, The University of WesternAustralia, Australia.