



## International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 5, Issue 10, October 2017

# Driver Identification Tracker and Vehicle Security System Using Arduino Uno

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**ABSTRACT:** This paper purposes to aim at designing a Driver Identification and Vehicle Security System which could effectively identify authenticate driver of the car. In this modern technology, Fingerprinting is more authentic tool used for security basis. Fingerprint of every person is unique, so the identification or authorization of a person becomes more reliable. This leads to an enhancement of the security in starting of the Engine. Biometric authentication is used in computer science as a form of identification and access control. Biometrics is the science and technology of measuring and analyzing biological data. In information technology, biometrics refers to technologies that measure and analyzes human body characteristics, such as DNA, fingerprints and other recognition pattern. The special type of a sensor is used to read the fingerprint of a person and matches the data by comparing it with the authorized fingerprint image, which is stored in the database. If the match is found then the vehicles will be started. In this project, digital image processing algorithms is employed to identify whether the incoming fingerprint image is genuine or forgery.

**KEYWORDS:** Arduino uno, Biometric fingerprint sensor, LCD, Regulated power supply, Relay, NPN transistors, Resistors.

### I. INTRODUCTION

In today's secure world biometric safety is on the top. Unlike other techniques which make use of passwords and numbers, that are needed to be remembered, biometric techniques make use of human body parts like fingerprints or even iris of your eyes and as we know that these things are unique for every individual, it makes biometric systems the most effective security system over others. Mumbai is a big and highly populated city. Lavish lifestyle and the most common aspect in city is the mode of transportation. Vehicles are very important and essential component in day to day life. Vehicles don't allow one group of people to isolate from another and has proved out to be very effective and handy in mapping up the distance. In recent times there have been many cases regarding theft of vehicles and thus many questions has been raised over safety of vehicles in Mumbai and same issues revolve all around the globe. There have been several cases wherein fake drivers get their control over cars of private companies like OLA, UBER and this gave rise to some serious crime. Also vehicle gets stolen and there is lot of vehicle related theft on national highways. A major step needs to be taken regarding safety of vehicles and hence taking all this severe issues in to consideration we have decided to make a Driver Identification and Vehicle Security System so that such cases can be brought under control to a larger extent and thus guaranteeing safety of cars and society. The main advantage of using a fingerprint



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pattern is that it is very low in cost as compared to other biometric system and the acceptance of using this system by the user is very high. It is easily adaptable in the environment which can enhance the security and robustness of the vehicles. Therefore the usefulness of designing and implementing a biometric security system using fingerprint technology, to prevent unauthorized vehicle starting the engine cannot be overemphasized. In section II Literature survey is discussed. Furthermore in section III, IV, V and VI Problem Definition and Proposed System, Results and Discussion, Future Scope and Conclusions are discussed. In the end References are mentioned.

## II. LITERATURE SURVEY

The review brings out the best way of authenticating a Driver in a fast, secure and convenient manner using Biometric Authentication technique replacing the password based systems. Biometrics is the science and technology of measuring and statistically analyzing biological data. Biometrics is used in cases to identify specific people by two characteristics namely,  $\frac{3}{4}$  Physiological (fingerprint, face recognition, hand geometry and iris recognition) and  $\frac{3}{4}$  Behavioral (signature, voice). Biometric Authentication is the act of establishing or confirming something (or someone) as authentic. BATS make use of the physiological characteristic, fingerprint. Here, the fingerprint reader is integrated with other applications of the product featuring password protection that frees users from having to remember and type passwords. The biometric security capability prevents unauthorized users from turning on the car and hence securing safety of the car as well as the Driver.[2]

## III. PROBLEM DEFINITION AND PROPOSED SYSTEM

### 3.1 OBJECTIVE

Traditionally, identifications are verified using distinguishing characteristics of the person, such as appearance or behavior. So, in small groups we might rely on body and facial characteristics, voice, birthmarks, tattoos, etc. But today, where we interact in larger groups, we also use various kinds of documents, such as birth certificates, Social Security Numbers (Social Insurance Numbers in Canada), and passports. Each of these methods of identification can fail however, if people attempt to deceive by covering their distinguishing characteristics, wearing disguises, or forging identity documents. Hence taking the above mentioned points in to consideration, biometric is the most secure and preferable security system. Biometrics refers to attempts to find physical or behavioral traits that can uniquely and accurately recognize people. The classic examples are fingerprints, which appear to be unique among individuals and relatively easy to capture and analyze. Biometric technologies are automated systems designed to assess physical or behavioral traits so that recognition decisions can be made automatically. As the demand for automobiles rises for ordinary families, there has been a continuous increase in the number of car thefts. Traditionally, a key and remote are used to enter and start the car. But once the key and remote are lost, complications can occur, especially if someone else finds those keys and uses them to steal the car. To prevent the rate of car theft from increasing, fingerprint identification technology has been introduced into the automotive antitheft system, eliminating the complexities and security risks associated with traditional key and remote security methods. Motor vehicle theft is a criminal act of stealing or attempting to steal a motor vehicle. Nationwide in the US in 2012, there were an estimated 721,053 motor vehicle thefts, or approximately 229.7 motor vehicles stolen for every 100,000 inhabitants. Property losses due to motor vehicle theft in 2012 were estimated at \$4.3 billion. These figures leave no doubt that the issue of car thefts is of major concern throughout the globe. There have been many cases regarding car theft on national highways. There have been several cases wherein fake drivers get their hands on cars of private companies like OLA, UBER and this gave rise to some serious crime. Also vehicle gets stolen and there is lot of vehicle related theft on national highways. The main aim for developing a secure vehicle system is to not allow it from being accessed by unauthenticated user .In this project, a sensor is used to read the data and match this from the stored data .Vehicle will be activated only when the stored data matches with the scan data. This leads to a more secure and reliable vehicle from being theft and protection will be increased against the crime. Or if the key is remain inside the car than anybody can misuse of that key or start the engine. So security is must by fingerprints and it cannot be similar for any two persons. So our vehicle will be secured.

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## 3.2 PROBLEM SOLUTION

A major step needs to be taken regarding safety of vehicles and hence taking all this severe issues in to consideration we have decided to make a Driver Identification and Vehicle Security System so that such cases can be brought under control to a larger extent and thus guaranteeing safety of cars and society. Our project, Driver Identification and Vehicle Security System, is a solution to prevent theft of vehicles. By using the Driver Identification and Vehicle Security System in a car or any vehicle for that matter the methods adopted by thieves to steal your car will not be useful. With the use of a Driver Identification and Vehicle Security System in a vehicle the current means of protection such as car alarms will not be required as our project Driver Identification and Vehicle Security System alone will be sufficient to ensure safety of the vehicle restricting all the vehicle related theft.

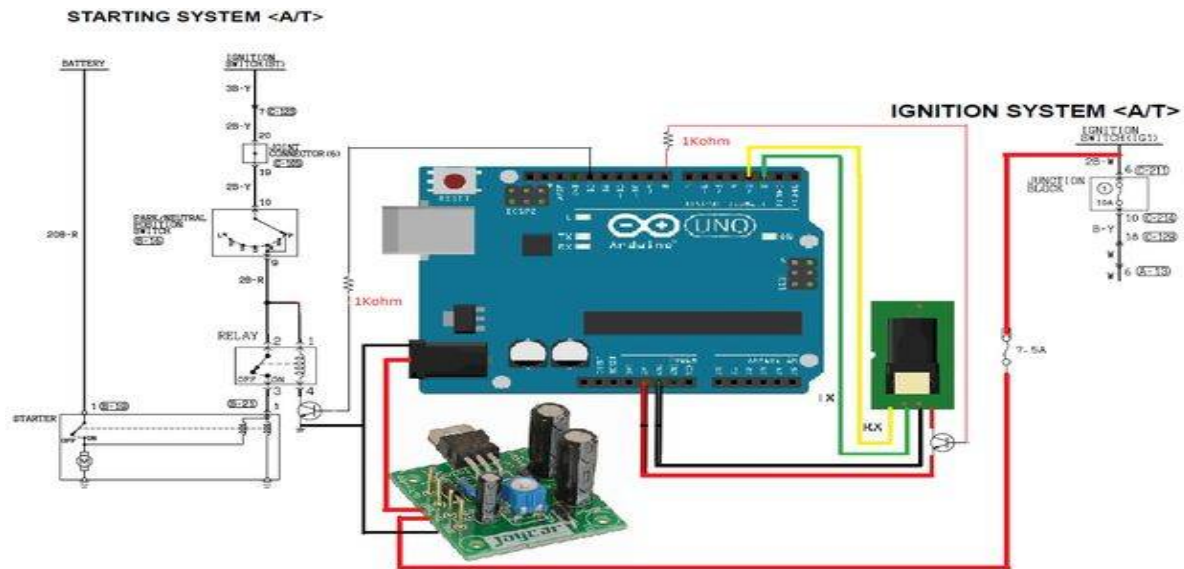


Fig.1: Connection Diagram

## 3.3 HARDWARE UTILIZATION

The Hardware utilizations in this project are Regulated power supply, biometric fingerprint sensor, NPN transistors, Resistors and Arduino uno.



Fig.2: Arduino Uno

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Fig.3: Fingerprint Sensor

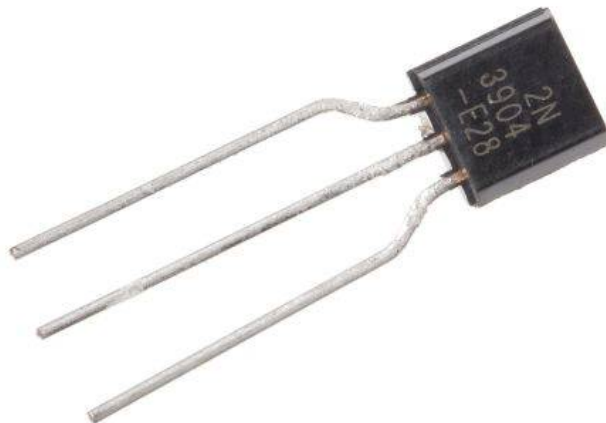


Fig.4: NPN transistors

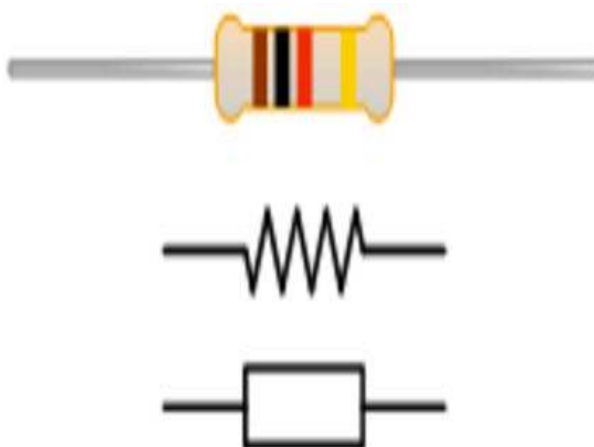


Fig.5: Resistors

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## 3.4 SOFTWARE UTILIZATION

The Software utilization in this project is Arduino IDE

## 3.5 WORKING

To create the Driver Identification and Vehicle Security System the above mentioned hardware and software are utilized. For simplicity we will modify the terms used to make it easy to comprehend for the purpose of application. The modification will include the modification of the starting system of the vehicle. The basic connection is that IG from ignition switch will supply voltage to the voltage regulator and then to arduino to turn the system on and off respectively. The coding will be done in such a way that the fingerprint sensor will be activated for 10 seconds and user can scan his/her finger for that duration of time. Finger match will activate the starter relay which in turn will start the engine allowing you to crack the engine lock. After 10 seconds the fingerprint sensor will turn off and we can turn it on again by starting the ignition switch again. No finger match detected by the system will automatically lead to conclusion that the user is not the authenticate user and it will keep the car locked and no cranking will occur. Since every car model does not have the same starting system configuration we will have to check the car's electrical wiring diagram prior to modifying the car's starting system depending upon which car model we are using for the same. Fingerprint sensor will control the relay and relay in response turn on or off the engine depending upon the results of fingerprint sensor.[4]

## 3.6 ALGORITHM FOR TESTING

- 1) Enrolled the biometric features of an individual.
- 2) Study on the basics of image processing algorithm to compare with the stored images.
- 3) Converting this flowchart into a code for implementation.
- 4) After the code has been implemented, now simulate the software to check.
- 5) Connect the sensor with the vehicle.
- 6) Once it is tested, it will start-up the engine.[3]

## IV. RESULTS AND DISCUSSIONS

Driver Identification and Vehicle Security System is designed to focus on the starting of the engine by the means of fingerprint. The reason for developing this model is to increase the security level and the robustness of the vehicles from day-to-day threats related to vehicle theft. Once the door has been unlocked it focuses on the startup of the engine through activation of relay by checking the authenticity of the verified user by the means of fingerprint. The user touches the fingerprint sensor and it authenticates the user, if the user is authorized then it automatically starts the engine by activating the relay. The sensor is directly connected to the engine, the wires are attached in such a way that it starts-up when the relay activates. The main reason for using this is that it is low in cost and the fingerprint biometric which is used in it cannot be matched of any two persons and is unique for every individual. So it result in the accurate result for verifying the owner of the vehicle who can use only access their own vehicle.[5] [1]

## 4.1 RESULTS

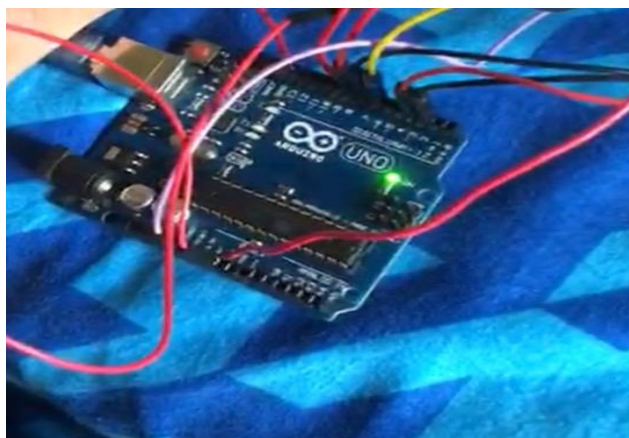


Fig.6: Arduino connections to activate relay

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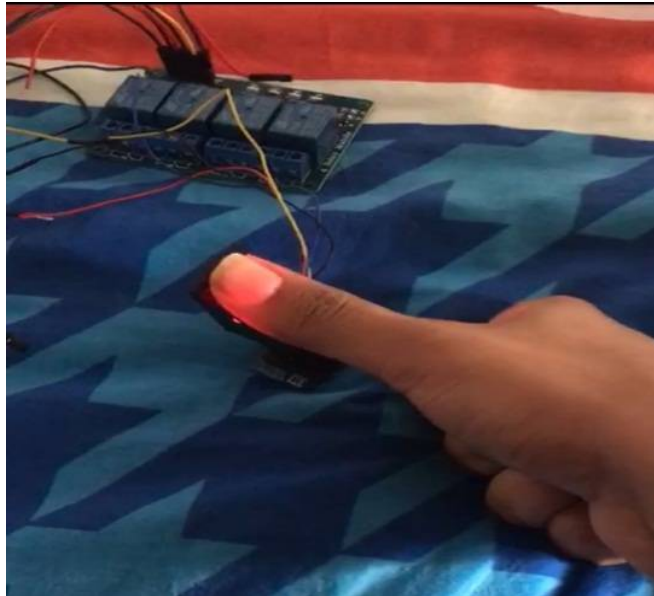


Fig.7: Fingerprint verification

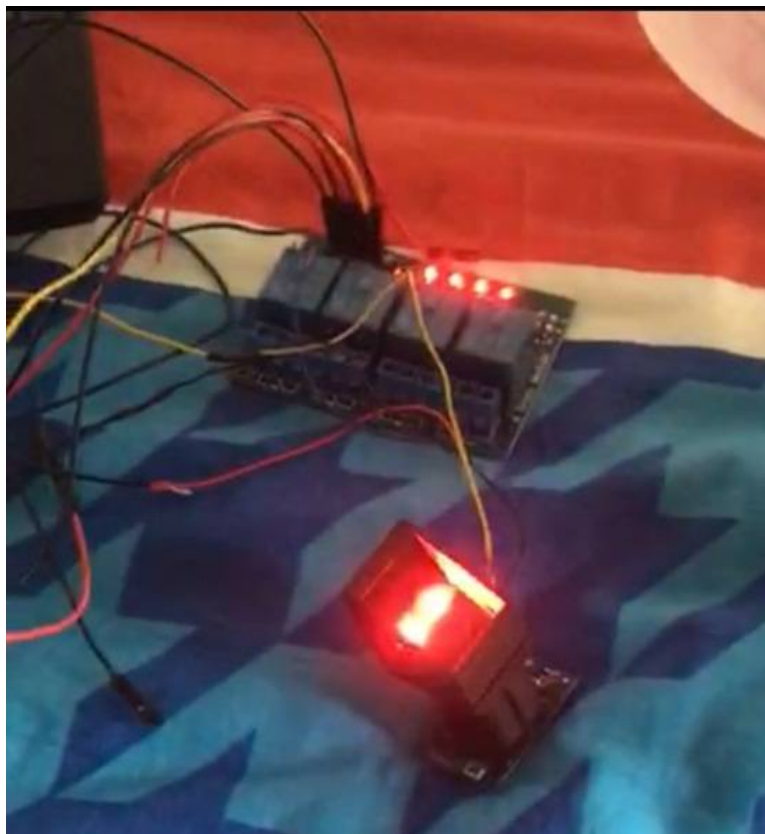


Fig.8: Activation of relay due to verification of authenticate user.

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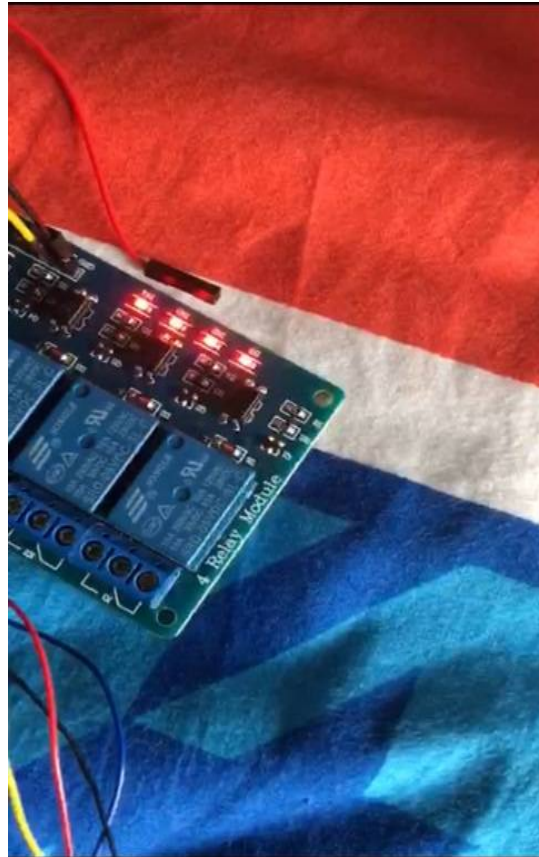


Fig.9: Relay activated

## 4.2 APPLICATION

Driving Identification Tracker can be used in any vehicle. The circuitry can be easily adjusted according to different vehicle without making major changes. In today's world Biometric security is on the top where the human body parts are used instead of numbers and locks. The application of this project can be in Taxi's, Private cars, Transport vehicles, UBER, OLA company etc.

## V. FUTURE SCOPE

Driver Identification and Vehicle Security System ensures the safety of the vehicle by allowing only authenticate users to access the vehicle. Furthermore as far as future scope is concerned we can add the wireless system to this tracker which will notify the owner of the vehicle if anyone forcefully tries to get an access to the vehicle. Also, we can make it cost efficient and user friendly by replacing arduino with any other relatively cheaper board. Hence it will act as a user friendly product. Its application and uses are not only restricted to four wheelers, it can also be installed in bikes and scooters.

## VI. CONCLUSION

Fingerprint Recognition was the first biometric approach to verify the person by downloading the images of sample in the database. The image is first analyzed and then identified, extracted and stored in the file of database. For the identification process, first it compares the query image against with the image stored in the database and then it verifies. From the above result, it has been cleared that the use of the biometric system offers the better and more



ISSN(Online): 2320-9801  
ISSN (Print): 2320-9798

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reliable resultant. Moreover, it is restricting the starting of the vehicles by unauthorized user. Only the fingerprint image verified has this ability to access the engine of the vehicle. It is important to avoid falling into the “It won’t happen to me” mentality especially when it comes to car theft situations. From the USA, UK, Mexico to Italy, Canada, Germany vehicle theft is prevalent throughout the globe. Consequently it is important for the vehicle owner to remain vigilant when it comes to protecting and securing their vehicle. With widespread interest in the field of computers and biometric security these days in automotive circles, it hardly seems surprising that automobile manufacturers hope to use these tools in their products. Therefore the Driver Identification and Vehicle Security System will ensure safety of the vehicle by restricting its access to only authenticated user and ensuring safety of vehicle as well as society.

## REFERENCES

- [1] H. Y. Xu, R. N. J. Veldhuis, T. A. M. Kevenaar, and T. A. H. M. Akkermans, “A fast minutiae-based fingerprint recognition system”, IEEE Systems Journal, vol. 3, no. 4, Dec. 2009
- [2] <https://en.wikipedia.org/wiki/Biometrics>
- [3] S. Mil'shtein, A. Pillai, A. Shendye, C. Liessner, and M. Baier, “Finger print recognition algorithms for partial and full fingerprints”, in Proc. Technologies for Homeland Security, IEEE, 2008, pp. 449- 452.
- [4]<http://www.instructables.com/id/Biometric-Arduino-Engine-Security-System/>
- [5]Mohammad A. Al-Khedher and Sharaf A. Al-Kheder, “Intelligent Anti-Theft and Tracking System for Automobiles”, Int. Journal of Machine Learning and Computing, February 2012.