# Fingerprint Based Vehicle Ignition System for Smart Automobiles

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**Abstract**- This paper focuses on the ignition of vehicle using fingerprint sensor and liquid crystal display, we are generating the same results along with same proficiency and accuracy in it by reducing its cost factor, so that it is easily affordable by customers and we can widely spread and implement the security in different domains. This approach would be fruitful to users who want to possess valid and authenticated entry. The main objective of this paper is to study the biometric vehicle ignition. Keys need to be carried and misplacing keys or losing them will cause a serious issue. Here we propose a solution to this problem by using a fingerprint authenticated vehicle starter system. The system provides a secure and hasslefree way to start/stop vehicle engine. User just needs to scan finger to start the car, no need to carry any key. The system only allows authorized users to start the vehicle.

## I. INTRODUCTION

Vehicles have been used in one form or other since the invention of wheel. With the invention of wheel, came in the 2nd most advanced technology, The Steam Engine. With the development of steam engine vehicle took the form of what we see today. In earlier times crank shaft mechanism were used to ignite the vehicles. Leaving that conventional method behind came in the concept of igniting the vehicles using key. And now, Keys are being replaced by Push start buttons. This project was started with the sole purpose of eliminating keys as conventional method of starting the vehicle. With the introduction of Biometrics in the 18th century, security advancement in technology has gone up to various levels. In the 18th century it was used to verify the employees working for the British Empire. Since then Biometrics has taken its toll. Biometrics is formed from the Greek words 'Bio' and 'Metrics' where 'Bio' means 'life' and 'Metrics' means 'to measure'.

Because of increasing number of theft cases of the two wheelers there is a need to enhance the security level of the bikes [3]. Traditional and commonly used key locks available in the bikes are well known to the thieves and thus it can be easily unlocked by the professional thieves. With the help of master key it becomes very easy to unlock the lock of the bikes by the thieves. This creates the demand of such type of lock which is new and provides an additional security level. The new and modern lock must be unique in itself i.e. it must be only unlocked by special and specific key. This type of feature is available in the biometrics locks i.e. the lock which can only be locked and unlocked by the human body features. Biometrics can include: face recognition, voice recognition, fingerprint recognition, eye (iris) recognition. Of all these type of special biometric recognition techniques the fingerprint recognition is the most widely used because fingerprint of every person on the earth is unique and can provide good reliability. Also the implementation of the fingerprint recognition system is easy and cheap than the other ones. Thus fingerprint recognition locking system can provide better reliability than the traditional locks and also is cheaper and easy than the other biometric locking system.

## II. METHODOLOGY

This paper we use a fingerprint module to read once identity to start the equipment. For this we use a ARDUINO microcontroller to enable the ignition system if the matching between scanned data and the already existing data is correct. Comparison is done inside the fingerprint module itself and its output is given to microcontroller. Result is displayed in a LCD display whether the user is authorized or not. R305 background highlight optical fingerprint verification module is the latest release of Mi axis Biometrics Co., Ltd. It consists of optical fingerprint sensor, high performance DSP processor and Flash. It boasts of function such as fingerprint login, fingerprint verification, fingerprint deletion, fingerprint upload, fingerprint download, etc. This can be used as a memory storage element to store the data of the finger print. In this paper we use a fingerprint module to read once identity to start the equipment. For this we use a microcontroller to enable the ignition system if the matching between scanned data and the already existing data is correct. Comparison is done inside the fingerprint module itself and its output is given to microcontroller. Result is displayed in a LCD display whether the user is authorised or not.

The method best allows licensed customers to start the car. Customers can first register into the process by using scanning fingerprints. The process makes it possible for multiple customers to register as authorized users. When into monitoring mode, the procedure exams for customers to scan. On scanning, the system tests if person is allowed user and starts car for licensed customers best.
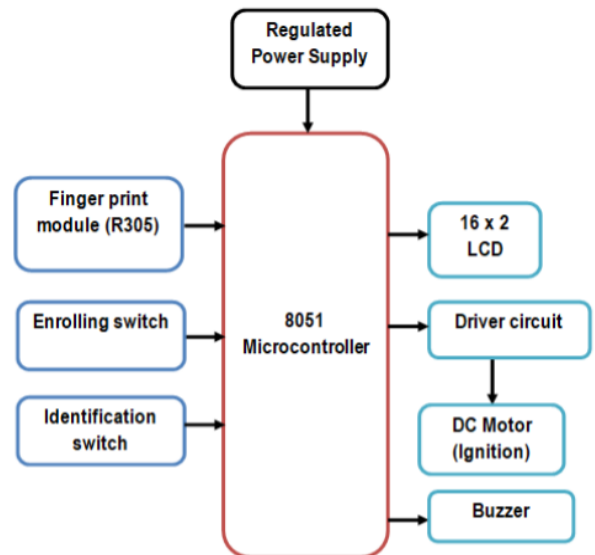
## III. HARDWARE IMPLEMENTATION



**Fig.1 Proposed block diagram**

### A. Regulated Power Supply:
A variable regulated power supply, also called a variable bench power supply, is one where you can continuously adjust the output voltage to your requirements. Varying the output of the power supply is the recommended way to test a project after having double checked parts placement against circuit drawings and the parts placement guide.

### B. LCD Interfacing
This section describes the operation modes of LCDs, then describes how to program and interface an LCD to art .8051 using Assembly and C.

### LCD operation
In recent years the LCD is finding widespread use replacing LEDs (seven-segment LEDs or other multi segment LEDs). This is due to the following reasons:

1. The declining prices of LCDs.
2. The ability of display numbers, characters, and graphics. This is ain contrast to LEDs, which are limited to numbers and a few characters.
3. Incorporation of a refreshing controller into the LCD, thereby relieving the CPU of the task of refreshing the LCD. In contrast, the

LED must be refreshed by the CPU (or in some other way) to keep displaying the data.

4. Ease of programming for characters and graphics.

## C. Buzzer:

Buzzer is an electronic device commonly used to produce sound. It is the phenomena of generating electricity when mechanical pressure is applied to certain materials and the vice versa is also true. Such materials are called piezo electric materials. Piezo electric materials are either naturally available or manmade. Piezoceramic is class of manmade material, which poses piezo electric effect and is widely used to make disc, the heart of piezo buzzer.

## D. Fingerprint sensor:

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. When IR light falls on the photodiode, The resistances and these output voltages, change in proportion to the magnitude of the IR light received.

## E. Motor Driver:

L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC motor with a single L293D IC. Dual H-bridge Motor Driver integrated circuit (IC).

It works on the concept of H-bridge. H-bridge is a circuit which allows the voltage to be flown in either direction. As you know voltage need to change its direction for being able to rotate the motor in clockwise or anticlockwise direction, Hence H-bridge IC are ideal for driving a DC motor. In a single L293D chip there are two h-Bridge circuit inside the IC which can rotate two dc motor independently. Due its size it is very much used in robotic application for controlling DC

motors. Given below is the pin diagram of a L293D motor controller.

## F. DC Motor:

A DC motor is any of a class of rotary electrical machines that converts direct current electrical power into mechanical power. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor.

## IV.    WORKING PRINCIPLE

Here we use an 8051 based microcontroller. The fingerprint sensor is attached to the microcontroller and also we've got an liquid crystal display show along with push buttons and starter motor. The motor is used to illustrate as automobile starter. This approach automates as well as automobile safety utilising fingerprint established approach. Fingerprint Identification enhances the security of a vehicle and makes it possible only for some selected people to start the vehicle. Not every person with the key will be able to start the bike. There will be matching of the person's data with the stored one and only in the case of match the bike will start otherwise not. Thus, by implementing this relatively cheap and easily available system on a vehicle one can ensure much greater security and exclusivity than that offered by a conventional lock and key. Fingerprint identification enhances the security of a vehicle and makes it possible only for some selected people to start the car. By implementing this relatively cheap and easily available system on a car one can ensure much greater security and exclusivity than that offered by a conventional lock and key.

## V.  RESULTS

The result which we expect from our project is that the motorcycle will be ignited only when the authorized person scans his/her finger on the

fingerprint module. The fingerprints of the authorized person(s) are stored in the fingerprint module. When any person put his/her finger on the fingerprint module then the data of the placed finger is matched with the stored data in the module. If the fingerprint data is found in the module then match condition occurs and the microcontroller ignites the bike otherwise bike will not start.
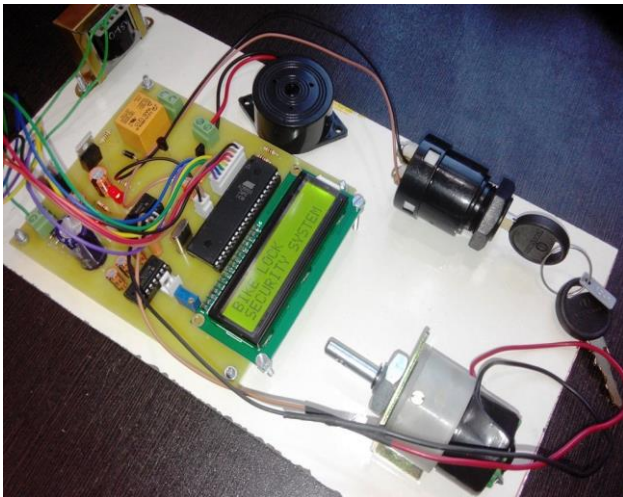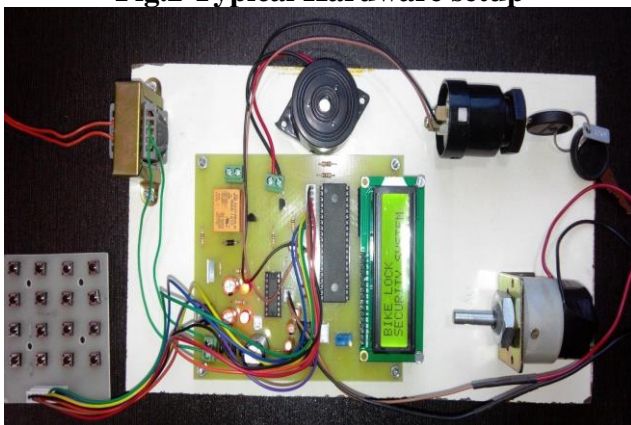

**Fig.2 Typical Hardware setup**


**Fig.3: Control switches on implementation**


**Fig.4: Using Fingerprint operation**

## VI. CONCLUSION

This project mainly focuses on the ignition of vehicle using sensors, which would provide ease to users in different circumstances, such as in case they forget the keys inside the vehicle or at the other current place. The use of fingerprint sensors provides the authentication to valid and registered users. The expected result by implementing this model on the motorcycle is that only the authorized person will be able to ignite the motorcycle. Not every person with the key will be able to start the bike. There will be matching of the person's data with the stored one and only in the case of match the bike will start otherwise not.

As the unique finger impression is a promising biometric design for recognizing it is used in case of both security and usability. This technology easily reduces the theft cases.

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