



ARDUINO BASED BIOMETRIC SENSING KEY FOR SAFETY TRANSPORTATION

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Abstract

A typical type of prototype aims to make a vehicle for driving safer than before. The principle function of the device is used to avoid unauthorized drivers and reduce car thefts. This proposed system is to recognize the biometric identification of the approved users with the help of biometric identification and which is connected with the Printed circuit board (PCB). When the unknown authorized persons will detect, vehicle ignition system will be turn off. This proposed system will help to increase our safety of the people seating inside the car. This sensor will help increase or decrease the number of users is going to drive with the permission of the stored dataset. The proposed finger print recognition system ensures a safety driving together with maintaining protocols. The proposed module will be more reliable and authorization of users with the user friendly modifications. It has easy to configure some other sensors or features.

Keywords: Arduino uno, Safety transportation system, fingerprint Sensor

I. INTRODUCTION

Vehicle usage is becoming significant all over the places, simultaneously car safety as well as security is most important for vehicle own persons. Improved technologies from Automobiles was more helps to prevent from theft one and identify from lost one in day by day. They are introducing some advanced techniques via both traditional (non-biometric) and modern (Biometric) approaches. In traditional method of protection model have less probable reliability and more probable for unsecure and easy to theft. Biometric systems are new and techniques like biometric thumb print recognition, iris recognition and facial recognition are becoming popular. Finger print based car driving system has enormous advantages from both the designer as well as user ends. It is very trouble-free to understand every step by step authentication and identification. Authentication of human beings is very fine and vital and immediate changes by the time. Fingerprint identification is one of the most consistent methods. Fingerprint of human is unique identity for every human being. Unique fingerprint identity is humanizing security of the proposed system. The process of fingerprint verification is divided into two types such as verification and identification. Every person human fingerprint claims the identity of a person with the help of above two processes (one-to-one matching). Fingerprint identification process is also divided into two types such as Determination and registration. It is most significant method for enlarging the database with ease (many-to-one matching). Human identification has made on comparison with the stored and real time data. It is very easy to modify the size of data base management. Both fingerprint identification has unanimous advantages such as more secure, cost effective, user responsive. Using this unique property of the fingerprint gains more marketable profit, it can also be used in the field of automobiles for providing security and theft protection.

II. LITERATURE SURVEY

Omidiora E. O. et al established key less car driving with the help of recognized fingerprint and it replaces the key into biometric identity. The fingerprint based vehicle unlock system is most reliable and traditional method other than all the biometric based unlocking system. It also provides a strong security mechanism for various security embedded domains. This system has the fingerprint recognized module with the huge data storage device. It will help to store and recall the user's fingerprint. If the fingerprint recognizes the valid user and it automatically ignites the vehicle.

Warghane et al revealed the prototype captured the fingerprint and enhances the minutiae using image preprocessing. The outcome of the preprocessed fingerprint minutiae compared with the stored database and it produces comparing graph matching problem. Enhancing of images is most useful to get more tuning parameters towards the better security and safety unlocksthe system. Their proposed methodology has long time consumption and prolong for every fingerprint.

Jaswanthet al,exposedhis fingerprint recognized module more focuses on economical and user defined. Fingerprint recognition has unique significance, it can works in all kind of weather and forecast even in a poor light condition.It requires minimum nodes to identify so it can store more number of templates.

III. BIOMETRIC RECOGNITION

Biometric recognition refers the individual identity and biological behavioral of human beings. Biologically unique identifiers of human beings such as fingerprint, Palm print, hand geometry, face, retina, iris and voice.

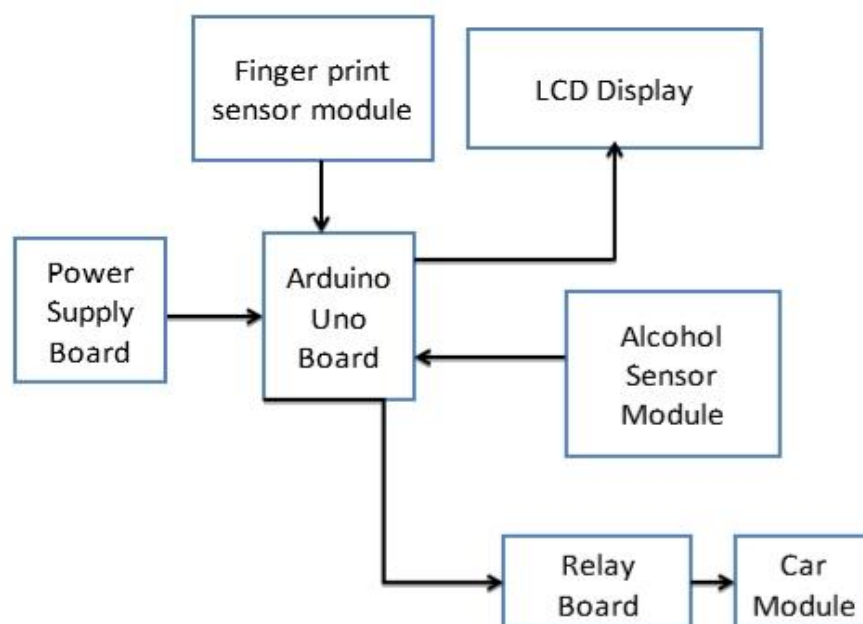


Fig 1: THE PROPOSED SYSTEM FOR BIOMETRIC RECOGNITION

Jain et al accomplished every identifier was authenticate each individual persons that all are stored in the reference database. Every time of computation, it verifies the individual identifiers and evaluates corresponding matches [5]. This above block diagram expresses how fingerprint and alcohol sensor acquire the data from real-time and given to the car module to ignite the vehicle as shown in fig1.

Fingerprint module:

Fingerprint capture Module is a device which is connected serially towards communication port. R305 biometric thumb print Sensor can be linked to any Arduino micro controller via MAX232 IC. This biometric thumb print scanner can store and compare the thumb print and accordingly giving the desired output. This simple biometric thumb print sensor project using micro controller can be used for home security, forensic study, criminal investigation, face identification, attendance system and many more. The complete system works under the matching algorithm, which is analyzed real-time user's fingerprints with already stored templates and given the perfect matched user identity.

Enrolling

Data enrolling is the method to authenticate user's fingerprint. In fingerprint sensor requires two major roles such as enroll fingerprints and search fingerprints. **Enroll** thumb prints which mean allocate ID's to each thumb print user. Once you've enrolled every print, you can easily 'use' the sensor, to locate which ID is presently being imaged.

Verification

With the Fingerprint Sensor module capture the current fingerprint and using the command verification, it search the current identification number is there exist in database [6]. After it compares and evaluates the match occurrences and it produces some value behind the comparison. If the car will needs to ignite, the value of comparison is must better than the threshold value of what the system assigned. In case the comparison value is lower than threshold it should not allow the car module into ignite.

Identification

Identification is the method or process to evaluate the value of current fingerprint and it assigned the value as ID number. From that ID number finds if any matches present in our database. If there matches found and it will stored into the host or else it will returned the device and fails to ignite [7].

Working Principle:

A general power supply of 9V is given to the system. Fingerprint sensor module, alcohol sensor and LCD display interfaced with the Arduino uno board with their own configurations. Every sensor are sensing the environment and to give a data to the process depends on the nature of sensor. Data received from the sensor, depends upon the program, what the value assigned as a threshold, arduino is given output to the car module. When the matched fingerprint place on the fingerprint sensor module suddenly car will ignite. Fingerprint based smart key evaluation was discussed with some case studies with the upcoming sections.

IV. IMPLEMENTATION AND RESULTS

Alcohol interfacing fingerprint based automobiles consists of complete alcohol detection and fingerprint based ignition system. The overall setup computes interconnects both the alcohol detection sensors. Vehicle ignition was controlled based upon both the outcome of alcohol and fingerprint sensors. The following figure shows the overall setup of the hardware. Initially the user has to blow near the alcohol sensor, in which two cases are possible

Case 1: If there is presence of alcohol, the user is refused for fingerprint registration.

Case2: The user respiration is free from alcohol and he can proceed to fingerprint registration module.

Based upon the two cases, once the user is alcohol presence, strictly the person declined to fingerprint verification. In case the user is alcohol free, the fingerprint registration makes the system ready to capture the finger. Status of the finger print sensor to register fingerprint is indicated by displaying red light on it as shown in fig.3. Then the system asks to register for the fingerprint by displaying the message as "Place your finger" and welcome. Once the person puts the thumb on the fingerprint sensor then the sensor tries to authorize the person by matching the placed fingerprint with the fingerprint stored in the database and there are two cases:

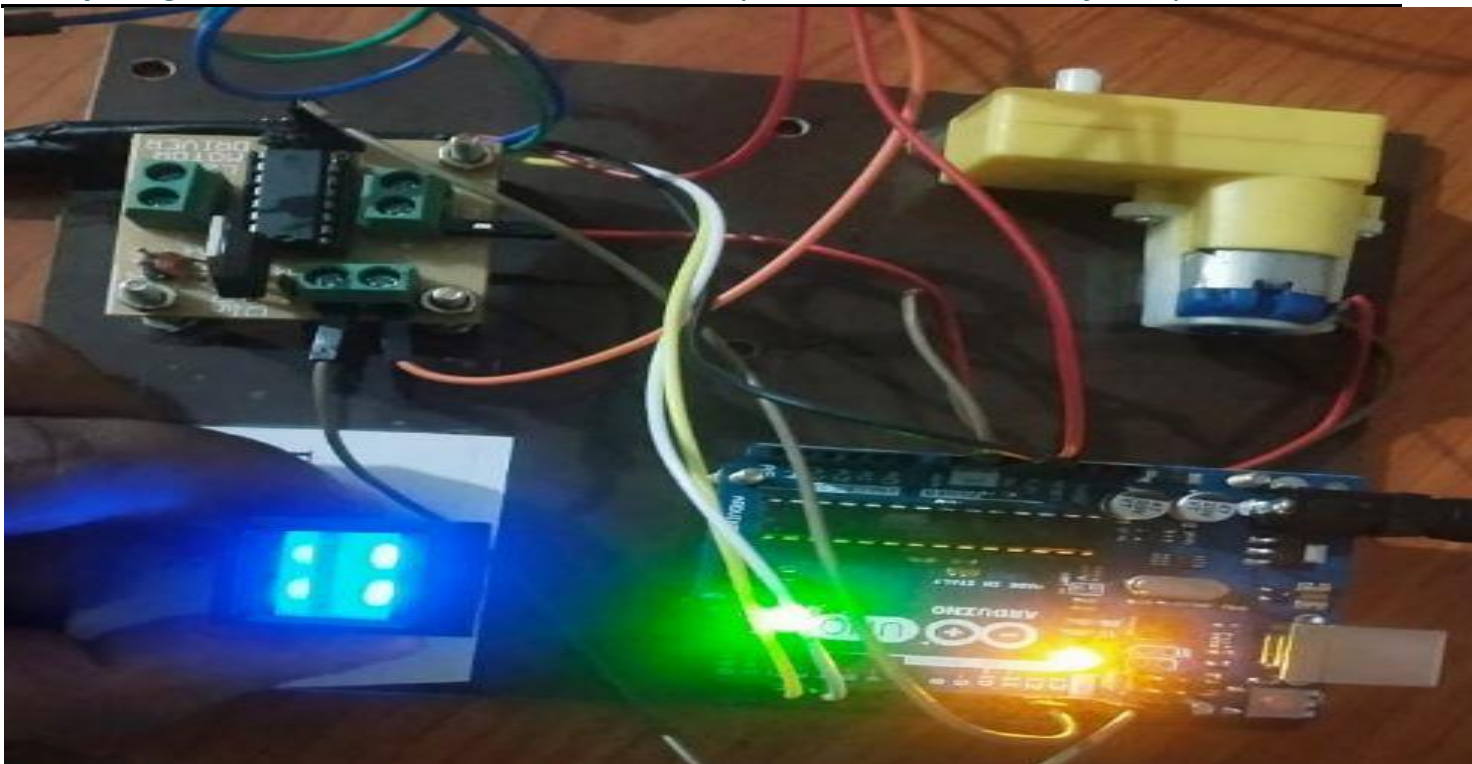


Fig 3: Case-1 Proper authentication of finger print

Case1: Fingerprint matches with the stored database and the user is allowed for accessing the vehicle. It is shown in fig 4.

Case2: In case the fingerprint placed doesnot matches the thumb print loaded in the system then the system will activatesaalarm, indicating the mismatch. It is shown in fig 4.



Fig 4: Case-1 Proper authentication of finger print



Fig 5: Case-2: Improper authentication of finger print

S. No	List of components	Specification
1	Power Supply Board <ul style="list-style-type: none"> ▪ Step up down Transformer ▪ Voltage Regulator ▪ Capacitor ▪ Resistor 	230V-9V LM7805 1000 μ F/25V, 100 μ F/25V, 0.1 μ F 470 ohm
2	Arduino Uno Board	ATMEGA 328P IC
3	Relay Board <ul style="list-style-type: none"> ▪ Relay ▪ Transistor ▪ Diode ▪ Resistor 	5V DC 2N 2222A 4N4007 10k
4	Finger print Sensor	R307
5	Prototype Car	5V DC Motor

Table 1: Arduino based Biometric Sensing Key For Safety Transportation

Thus an efficient system for both alcohol detection and vehicle authentication is made possible using Arduino microcontroller embedded with alcohol sensor and finger print sensor. The proposed project competes with the existing and conventional system and operates in a very low voltage and less production cost.

V. CONCLUSION

The device or module of a fingerprint identification and alcohol detection ensures the safety and protection of both the user and the common peoples. It shows the perfect user only to drive the car. Initially alcohol detecting sensor senses any abnormal gases present in the car. If the odor of alcohol detect, the user strictly declined to the fingerprint verification. Else, the absence of alcohol odor, the user allow for fingerprint verification. When the passes get from the alcohol sensor, the user placed his finger on the fingerprint sensor. In a registration mode user can register their fingerprint like minutiae into database and it is called as user driving identifier. The vehicle start is highly influenced when the authorized user finger is disfigured or faulty or tint, the database won't allow the user to start the vehicle. Thus the proposed low cost system is available on a car and it proves extreme advantages than conventional keys. LCD display is used to show the current status of the system. The proposed device overcomes all the limitations towards the upright secured level.

There are various upgrades or performances that could be attached on to the current version of this database to make it faster in terms of safety and ease of use.

VI. References

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