

SMART LICENSE-BASED VEHICLE SAFETY AND SECURITY SYSTEM

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Abstract: Driving a vehicle without license is a vital cause of road accidents. In order to prevent such accidents, this system is proposed. A reliable identification method is fingerprint authentication method for driving, which is quite popular identification methods. By using this method, we can control road accidents by preventing non-licensees from driving. The new system stores the fingerprint of the owner and the persons we select earlier. After fingerprint authentication, license verification is followed. If approved person only then it will proceed on to ignition; if the person is not approved, then the vehicle owner will receive OTP using GSM and IOT based application; if approved and expired card, it will display the validity of the license. The system implementation ensures that license is compulsory to who are all driving and to avoid driving with expired license.

Keywords: RFID reader, Fingerprint sensor, GSM Modem

I.Introduction

Driving without driving license is a major problem in many countries. Survey says that the accidents happened mostly by the unlicensed drivers, drunken drivers and less usage of seatbelts.

According to WHO statistics, out of 11.8 lakh road accident deaths across the world, 84,674 deaths were reported from India alone. In 2004 the number of deaths had amplified to 92,618. The mortality rate in India is 8.7 per hundred thousand populations which is quite high as compared to other countries. The appraised number of deaths in India for the years 2005, 2006 and 2014 are 1,10,300, 1,05,725 and 1,54,600. In existing method, keys were used to start the vehicle. By this method, vehicles can be

stolen easily and unable to prevent accidents. Fingerprint authentication is one of the best methods which ensures safety of the vehicle. By using this method, we can prevent non-licensees from driving vehicles which in-turn reduces accidents. This project aims to introduce an architecture which detects validity of the license of the driver and takes a strong decision to turn on or off the ignition system based on the validity of the license.

The main aim of this project is to allow or deny access to operate a vehicle, on the basis of the driving license and vehicle ownership. A driver should have a valid driving license to drive a vehicle. This would strongly prevent one from driving a vehicle if he/she is not licensed and helps in reducing road accidents.

II.Related Work

A. Arduino Microcontroller

In this project, Arduino Uno is a microcontroller board. This microcontroller is based on the ATmega328 (datasheet). It possesses 14 digital input/output pins, 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. Microcontroller will verify the provided finger print of the person with the finger print stored in smart card. The controller did not accept the driving license card, if its validity is expired. If the driving license date is going to expire, it will give the alert signal to the user about the expired status of the driving license card.

B. RFID Reader

Here, we have used EM18 RFID reader module. This is an easy way to use RFID Reader with on board antenna. It is used to read RFID cards which

work at 125kHz. When a RFID card comes in the range of the reader, the unique data in the card is received by the reader in the form of RF signal. The Reader module comes with an on-chip antenna and can be powered with a 5V power supply. We need to power-up the module and connect the Transmit pin of the module to receive pin of the microcontroller.

C. Fingerprint Module

The fingerprint module used to read the finger print images. Here we are using R307 fingerprint sensor module. It consists of optical fingerprint sensor, high-speed DSP processor, high-performance fingerprint alignment algorithm, high-capacity flash chips and other hardware and software composition, stable performance, simple structure, with fingerprint entry, image processing, fingerprint matching, search and template storage and other functions.

D. Relay

In this project, we have relay. Relay is an electrically operated switch. The current that is flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts.

Relays allow one circuit to switch a second circuit which can be completely separate from the first. For example, a low voltage battery circuit can use a relay to switch a 230V AC mains circuit. There is no electrical connection inside the relay between the two circuits; the link is magnetic and mechanical.

III. System Implementation

Microcontroller plays an important role in this project. It receives the signals from the various parameters in form of bits and delivers the output.

First, when start key is pressed, it will display as “**VERIFY FINGERPRINT**”. We need to scan our fingerprint in the Fingerprint module, if the fingerprint is valid, it will proceed on to next step, if not the vehicle will not get ignited.

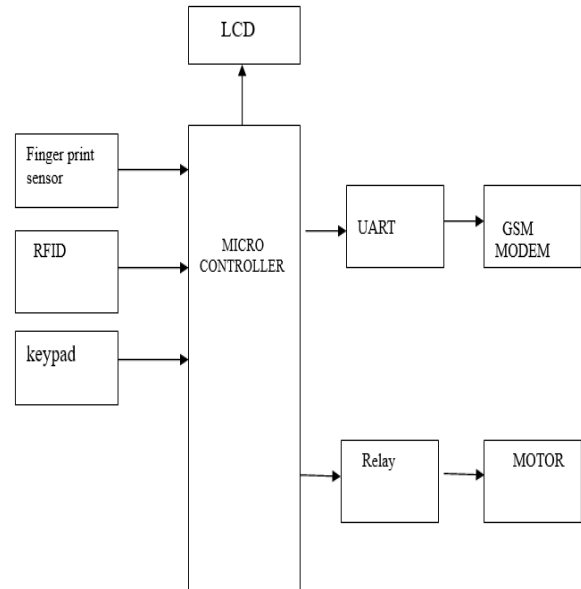


Fig 1. Block Diagram

Then, scan the smart license on the RFID Reader. It will detect and display the desired output as whether the smart license is authorized or unauthorized or it will expire or not.

If license is authorized, it will move on to next step. Else if the license is unauthorized license, it will ask for OTP verification which is being performed using IOT and using ESP8266 Wi-Fi Module.

Only after the verification of the OTP, it will move on to next module of vehicle ignition. And if license is authorized but it is going to get expired in a few days, that will be get displayed on the LCD Display as in how many days it will get expired.

Once all the authentication gets completed the motor will start to rotate and in turn vehicle will get ignited and its ready for the drive.

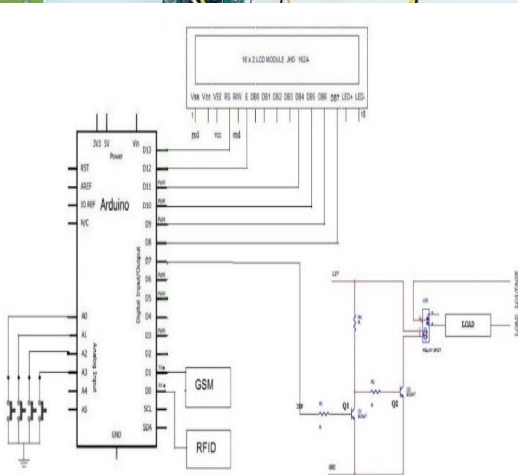
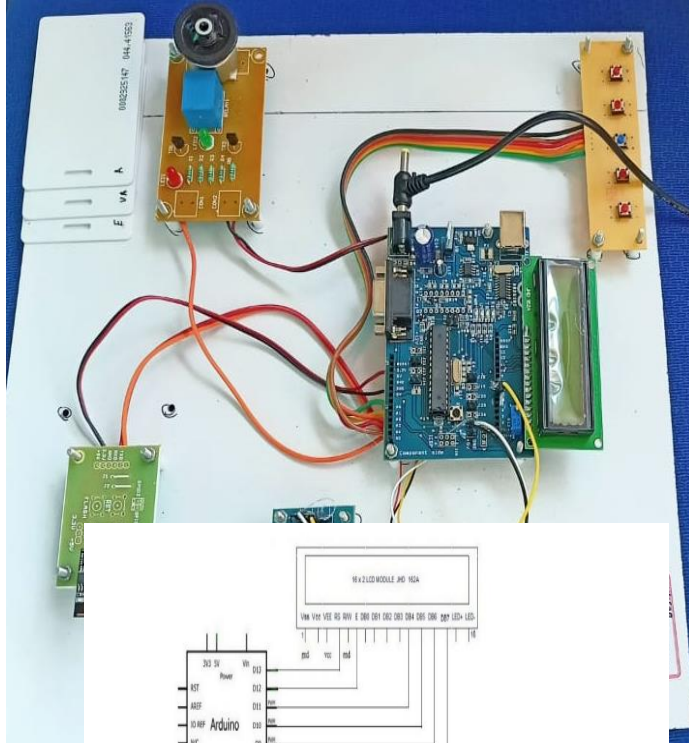


Fig 2.System Architecture

Fig 3.System Hardware

III.Conclusion &Future scope

From this paper, we want to conclude that fingerprint was a secure biometric authentication and will be used for security purposes. By using this system, no one can drive without driving license and also no one can use the others driving license.

In this method, the system will also alert the user about the validity period of the driving license. The above input and output study of the proposed hardware system demonstrates that the vehicle can be ensured that it is been driven only by the persons who have valid license.

The system also guarantees in providing facility for the learner's licensees to drive vehicle by having a licensed person near them. It is going to be of boundless use for the safety of drivers and irregularities that can be kept at check without any loopholes.

The established model serves as an stimulus to drive future research, geared towards developing a more strong and embedded real-time fingerprint authentication-based ignition systems in vehicles. The present module can be interfaced with GSM module which would be of great use in future.

The combined new operating module can be used to screen from remote location about the vehicle. The data can be used to monitor the person, who is driving the vehicle, by that way, theft can be minimized since it would help to find the person driving along with location details.

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