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FINGERPRINT AUTHENTICATION SYSTEM FOR VEHICLES USING ARDUINO

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Abstract - A fingerprint -based vehicle security system combines the advanced technology to enhance both security and safety features of vehicles Vehicle safety has become a matter of prime importance. Investigators owe this increase in thefts to the lack of proper parking spaces. We have developed a prototype model of a fingerprint-based security system for vehicles by interfacing Fingerprint sensor module R307 along with Arduino.

Index Terms – Fingerprint sensor, Global System for Mobile communication (GSM) , Global Positioning System (GPS) , Liquid Crystal Display (LCD)

INTRODUCTION

Automobile security is one of the growing concerns in India. Safeguarding of vehicle against theft is one of the major issues confronting developing countries. Varied techniques have been tried and tested to protect and secure the automobiles. Embedded computing is an emerging technology widely used in improving and enhancing security against the theft of vehicles. Vehicle security is an important issue these days due to the rising number of vehicle thefts.This system utilizes fingerprint or biometric technology, to grant access to the vehicle and prevent unauthorized use.

Fig 1: Car Thefting

LITERATURE SURVEY

1. The paper titled **" car security system employing fingerprint scanned & IOT "** Aritra Acharya and Rajendra Prasad (2020) Indian journal of science and technology they go on to say how critical it is to maintain our automobile as safe as we maintain our cellphones the team discuss how to maintain the biometric auto entry system to keep all vehicle safe when the automobile is robbed the notification will be sent to the owner.
2. The paper titled **"keyless automobile entry system "** Rajeev Velikkal (2020) Indian journal of science and technology he created this with help of an Arduino kit when he drew and programmed simple programing languages are used to create the design .

3. The paper titled **"fingerprint based locking system "**Sayantam Sadhukhan 2019 in an Indian research paper it is created to increase the bikes safety the biggest problem is that once battery is run out it will not operate the object of this work is to investigate & comprehend the notation of fingerprint module the owner of the bike can add or remove fingerprint.

4. The paper titled **"fingerprint sensor based anti -theft system for vehicles"** S Selvaraju 2019 national conference on emerging the use of microcontroller & GSM module to avoid the automobile burglary fingerprint sensor takes the pic & compare the originals of each print detected a biometric method for vehicles employment fingerprint .

I. BLOCK DIAGRAM OF PROPOSED SYSTEM

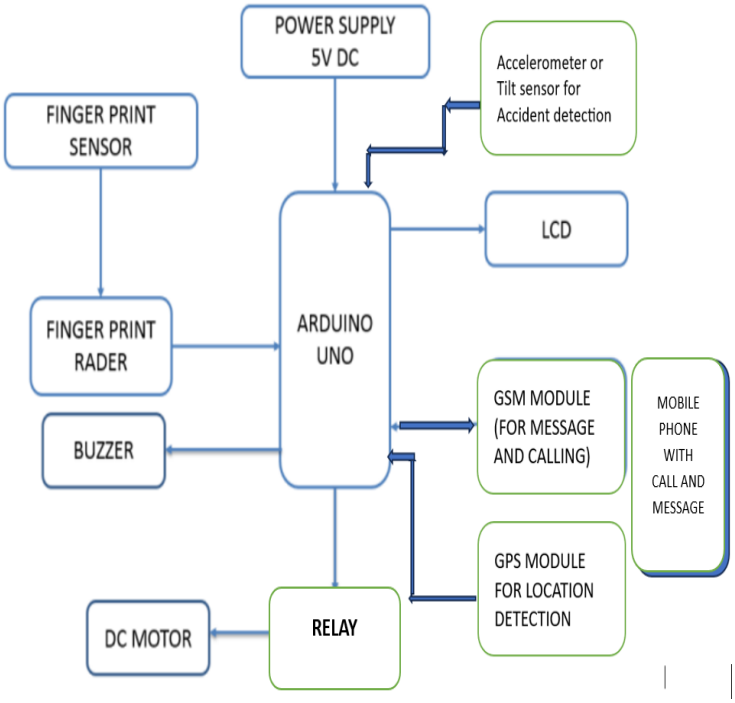


Fig 2: Block Diagram

II. SYSTEM COMPONENTS

1. Fingerprint sensor :

Fingerprint sensor module capable of accurately detecting fingerprints. A fingerprint sensor is an electronic device used to capture a digital image of the fingerprint pattern. The captured image is called a live scalive scan is digitally processed to create a biometric template which is stored and used for matching. Optical fingerprint imaging involves capturing digital image of the print using visible light. This type of sensor is, in essence, a specialized camera.The top layer of the sensor, where the finger is placed.

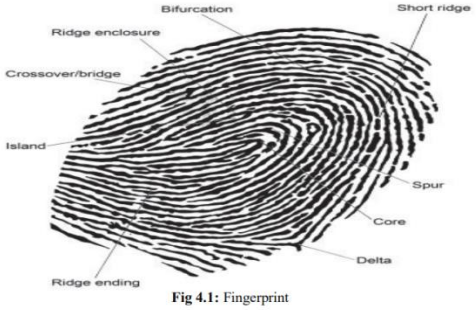


Fig 4.1: Fingerprint

Fig 3: Fingerprint sensor

2. Arduino UNO:

Fig 4: Arduino UNO

Arduino Uno kit is used as the main component which is being interfaced with others as dc driver, sensors and more. In this proposed system, two Arduino Uno kits are used as it has only one serial communication slot. One kit is interfaced with GSM Module and sensors. The other kit is interfaced with Bluetooth device and the dc driver circuit. The crack that has been detected by sensors sends a signal to AT Mega (Arduino Uno Kit).

3 LCD display :

it is a electronically modulated optical device that uses the light – modulating properties of liquid crystals combined with polarizers . liquid crystals do not emit light directly lcds are available to display arbitrary images or fixed images with low information content

Fig 5: LCD display

4 GSM & GPS:

Fig 6: GSM & GPS

GSM that is global system for mobile communication is the module that sends the message from the location where the crack or obstacle is detected to the authorized central unit or nearby station. GSM has 42 pins in total but it use only 4 pins that are ground, power, Tx and Rx. GPS is known as Global Positioning System is an advance and highly fast response module. The GPS module generates the latitude and longitude of the location where a crack or obstacle is detected.

5 DC motor :

it is an electrical motor that uses direct current to produce mechanical force. The most common types rely on magnetic forces produced by currents in the coils. Nearly all types of dc motors have some internal mechanism , either electromagnetic or electronic ,to periodically change the direction of current in part of the motor

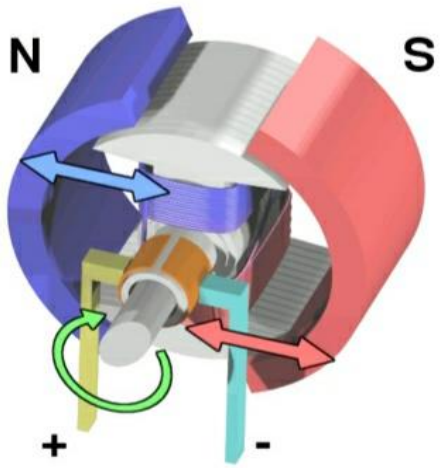
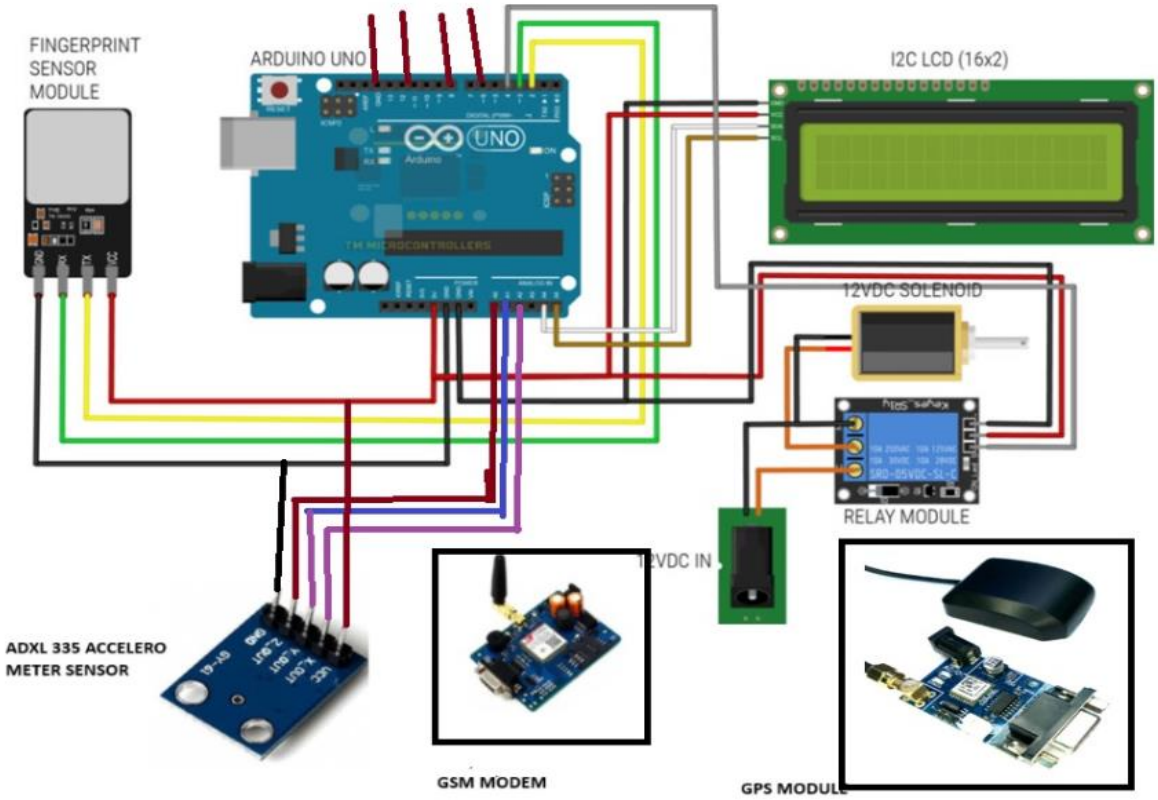


Fig 7 : DC motor

Fig 8: circuit diagram



Result :

The main reason for using this is low in cost and the fingerprint which is used it cannot be matched of any to people this will help for theft purpose and the fingerprint need to be stored once it is stored the vehicles can be started this helps to the safety & security purpose in this we have used GSM,GPS because for tracking the vehicles

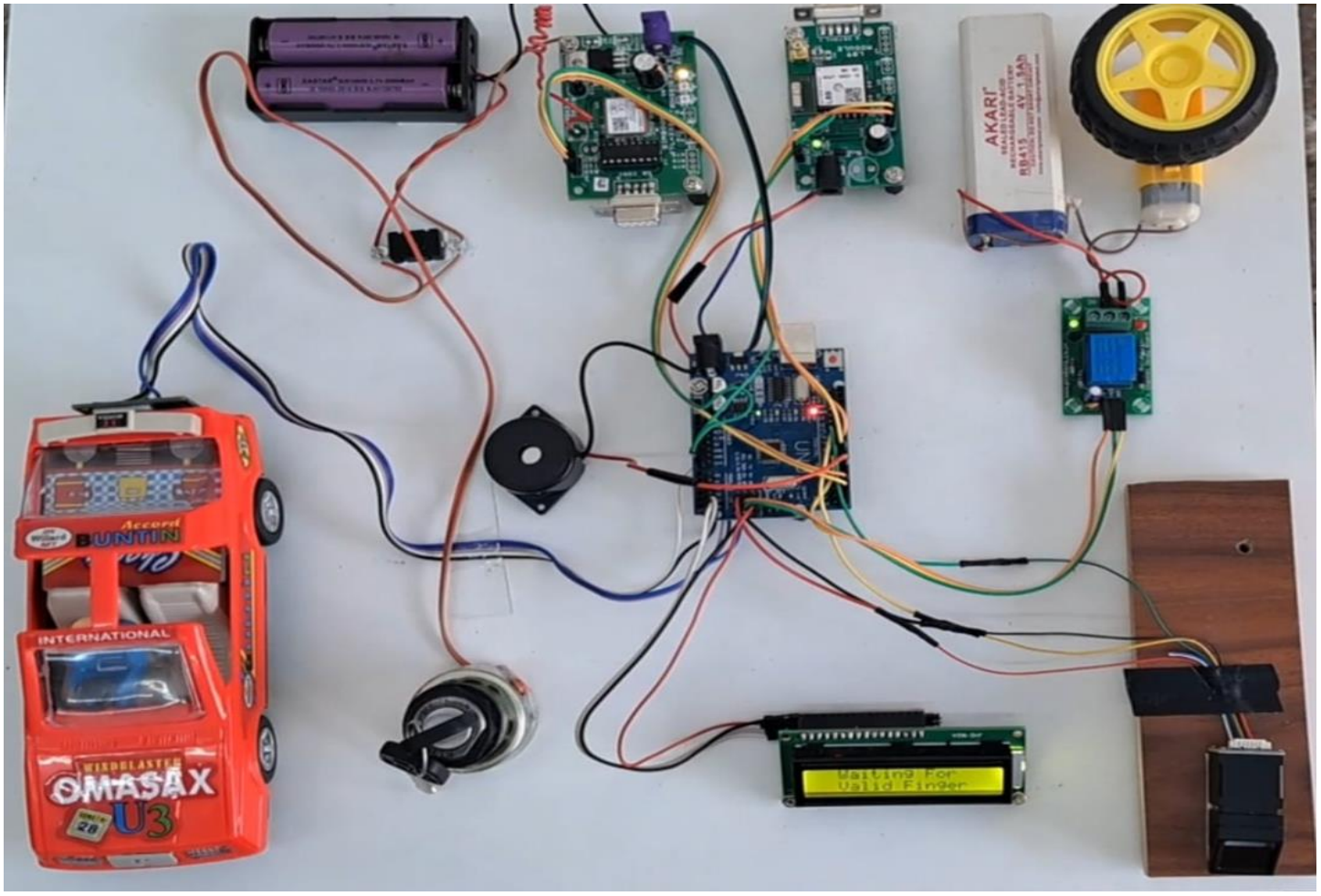


Fig 9 : Result

III. CONCLUSION AND FUTURE WORK

The module is made to concentrate on the engine starting process using a fingerprint. This type was created in order to improve the vehicle level of security and their resistance to common threats. The user touches the fingerprint sensor and it authenticates the user, if the user is authorized then it automatically starts to engine. The wires are attached so that the sensor can start the engine when it is directly connected to it .Everyone fingerprint is distinctive and only authorized users may access the vehicle. The vehicle will not ignite for everyone who has a key. The data of the individual will be compared to that of the database, and only if there is a match the vehicle will be used .In the event of a hijacking ,the vehicle owner may safely exit the vehicle. Such customized vehicles with security system will help in reducing theft of a vehicle.

IV. REFERENCES

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