



VEHICLE PROTECTION WITH FINGERPRINT VERIFICATION AND GPS

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Abstract—The number of stolen vehicle in recent time is increasing day-by-day and vehicle security is a serious concern. Conventional locks can be effortlessly broken. The best decision is using bio-metric to recognize a person, This unique fingerprint can be utilized to find a match between two diverse persons. This framework is created using an Arduino with fingerprint sensor and GPS. Fingerprint is Unique and permanence, so fingerprint verification can be used in your vehicle against the customary lock framework.

Keywords—Bio-metric, Arduino, Fingerprint verification, GPS.

I. INTRODUCTION

Bio-metric is one of the secure ways to protect your vehicle and is better than the conventional method. This finger impression can be used to find a match between two diverse persons. Fingerprint is one of the highly used bio-metric to identify a individual and to verify his/her identity. Bio-metric of a individual do not change so fingerprint can be considered as perpetual. This framework likewise involves a bio-metric security arrangement to the vehicle and unique fingerprint confirmation of the driver is used to shield the vehicle from burglary.

All Bio-metric security work in two stages, The enrollment of the bio-metric and the recognition of the bio-metric. The recognition is further divided into two part, Which is identification of the fingerprint (Bio-metric) and verification of the Fingerprint (bio-metric). During

enrollment of the fingerprint, n number of images are captured and stored in the system database. During the confirmation or verification the unique mark is coordinated with the unique mark in the database (1:n), At the point when the unique mark is coordinated then the confirmation is successful (1:1).

The result of the fingerprint (Bio-metric) is displayed in the Liquid crystal display (LCD). Vehicle Tracking system is used to find the location of a vehicle using GPS module and other radio route frameworks working through satellites and ground based stations. Global system for mobile and Global positioning system based vehicle location and tracking framework gives compelling and continuous mapping of vehicle.

The two way correspondence is accomplished utilizing an IoT (Node MCU). Fingerprint of every individual is unique, When there is mismatch in fingerprint the system sends an update to the real time database and the owner of the vehicle will get the update of the current location. If the fingerprint is matched then the motor drive will switch on the motor. This usage contains an implanted framework with fingerprint sensor and Global positioning system (GPS) introduced in your vehicle.

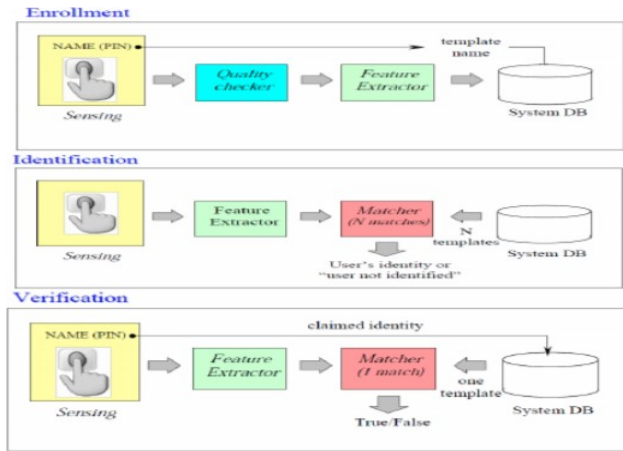


Fig 1:Fingerprint Enrollment and verification

II. RELATED WORK

In this paper, "Security and Accuracy of fingerprint based bio-metric"[1] a review is presented on the latest developments in the fingerprint based bio-metrics covering the viewpoints with the end goal of improving system security and recognition accuracy. It is appeared in the paper that analysts keep on confronting difficulties in handling the most basic assaults to bio-metric databases.

In this paper, "Anti-theft protection of vehicle by Global system for mobile(GSM) and Global positioning system(GPS) with fingerprint verification"[2] Vehicle burglary is occurring on leaving the vehicle in parking and now and then when driving in unbound spots. This work tells us how to keep from this sort of burglary and gives greater security to the vehicles. The framework contains a single-board which is outfitted with Global system for mobile(GSM) and Global positioning system(GPS) alongside a micro controller introduced in the vehicle.

In this paper, "Vehicle Tracking Using a Reliable Embedded Data Acquisition System With Global positioning system(GPS) and Global system for mobile(GSM) "[3] we present the standards of a low operational-cost yet adaptable Internet-based data-acquisition system. The embedded system conveys through General Packet Radio Service (GPRS), which makes it available from anyplace on the planet through a web server incorporated in the embedded system.

In this paper, "Real time vehicle tracking system using Global system for mobile and Global positioning system technology-An anti-theft tracking system"[4] A vehicle tracking system is an electronic embedded device installed in the vehicle to enable the owner or a third party to track the vehicle's location and this paper proposed to structure a vehicle tracking framework that works utilizing Global positioning system(GPS) and Global system for mobile communication(GSM) innovation.

In this paper, "A study of bio-metric approach for vehicle security system using fingerprint recognition"[5], A security framework is utilized alongside with global positioning system and fingerprint verification recognition. This paper gives a writing overview on the vehicle security framework utilizing individual distinguishing proof procedures. The study mostly accentuates a significant methodologies for programmed individual recognizable proof, to be specific unique fingerprint acknowledgment and different existing vehicle security framework. This security framework can be actualized utilizing the micro-controller.

III. METHODOLOGY

A. System Design and analysis

A framework has been created on a micro-controller that comprises of Global positioning system and fingerprint. A two way correspondence process is accomplished utilizing a Node MCU. Our project involves a bio-metric security arrangement to the vehicle and fingerprint confirmation of the owner is used to protect the vehicle from burglary. Unique fingerprint verification can be characterized as a technique for confirming a match between two human fingerprint. Fingerprint is one of the various sorts of bio-metric used to perceive individuals and affirm their character. It is understood that every individual has an exceptional interesting fingerprint picture. At every point when there is mismatch in the fingerprint, location is calculated by the GPS module by communicating with the satellite and the location is updated to the real time database, then the vehicle location is sent to the owner. Fire base real time Database is used as the cloud server between the Node MCU and the Owner. The information in the Fire base real time database can be accessed by the owner using our Android application. If there is a match in the fingerprint, motor drive will start the motor of a vehicle.

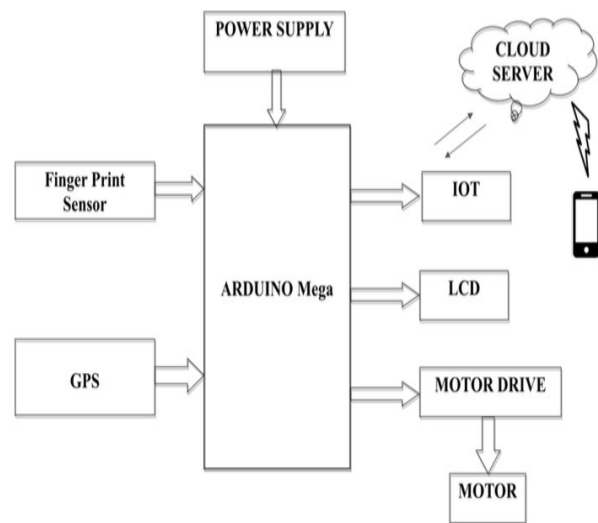


Fig 2:Block diagram

B. Hardware

The components used are

- I. Arduino Mega
- II. Fingerprint sensor
- III. Node MCU(EP8299)
- IV. LCD
- V. GPS module

- Arduino Mega

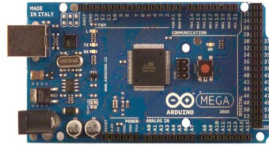


Fig 3: Arduino Mega

This embedded system contains, 54 digital input/output pins,16 analog input,4 UARTS,a USB Connection,a power jack,an IPC header and a reset button. It is based on ATmega2560.

- Fingerprint Sensor



Fig 4:Fingerprint sensor

Fingerprint sensor is a device which processes the input fingerprint and stores it in the fingerprint database,this sensor can be legitimately associated with the PC's com port.

- Node MCU(EP8299)



Fig 5: Node MCU

Node MCU is an open source platform Wi-Fi chip developed by Espressif systems by TP/IP protocol.It is mostly used for development for internet of things embedded applications which supports 2.3GHz Wi-Fi.

- LCD

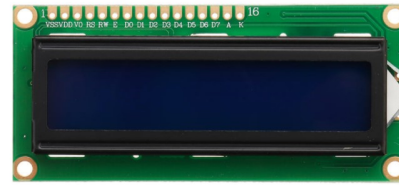


Fig 6:LCD

A 16x2 liquid crystal display means it can display 16characters per line and there are 2 such lines. This liquid crystal display each character is displayed in 5x7pixel matrix.

- GPS Module



Fig 7: GPS Module

This module calculates the geographical location by communicating with the satellite.

C. Software

The software used are,

- I. Arduino IDE
- II. Proteus

- Arduino IDE

Arduino IDE is a GUI based software that underpins all the Arduino based micro controllers. It is an open-source software(IDE) that make it extremely simple to compose code and furthermore transfer it to the board. It runs on different working frameworks Windows, MacOSX, Linux.

- Proteus

The Proteus design suite is a restrictive programming device suite utilized basically for electronic design automation.

EXPERIMENTAL RESULTS

The project or system is tried under different conditions to guarantee its rightness. The testing conditions for this undertaking incorporate a few approved and unapproved endeavor to access the system.

SCENARIO	INPUT TO SYSTEM	OUTPUT
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Authorized Access	Bio-metric (Fingerprint) Registered fingerprint	The vehicle ignition is turned on. ❖
Unauthorized Access	Bio-metric (fingerprint) Unregistered fingerprint	The vehicle ignition is not turned on.GPS finds the location of the vehicle and updates the Firebase Real time database. ❖

hindered,Hence location given by the the Global positioning system will not be accurate. Sometimes the vehicle parked in the parking lot is in danger as your vehicle can be dragged from one place to other without accessing your vehicle,In this case we can add a drag sensor which will detect the vehicle being dragged and inform the owner of the vehicle and the global positioning system will find the location of the vehicle when your vehicle is accessed. The mobile network may not be available and the warning may not reach the vehicle proprietor on schedule and we can overcome this by sending a email to the owner of the vehicle so that the vehicle proprietor gets the information on time.

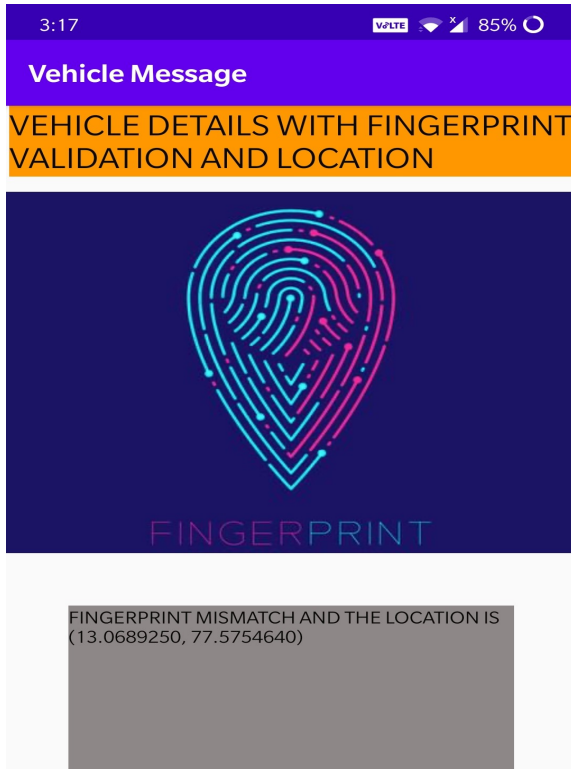


Fig 8: Android application which displays the location.

FUTURE ENHANCEMENT

Our project"Vehicle protection with fingerprint verification and Global Positioning system" can be further improved,

- ❖ The Global positioning system module(receiver) connection with the satellite maybe disturbed and

CONCLUSION

Security is the basic criteria in all sort of applications, Our project improves the degree of security for vehicle. As a unique fingerprint is a promising bio-metric design for distinguishing an individual as far as both security and usability is concerned.We implemented an anti-theft device with real time tracking which is achieved with the help of global positioning system and a fingerprint validation as a extra layer of security to prevent all types of vehicle theft.

ACKNOWLEDGMENT

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