

## IOT BASED VEHICLE CONTROLLING BY USING FINGERPRINT SENSOR

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**ABSTRACT:** in many instances people feels hard to unlock the key for the vehicle which are under perfect working condition as well as security for the vehicles is growing in risk manner such as theft and vehicle detection.so in order to bring a solution for this problem this system can be implemented. The IOT is the trending main module now a days it is used in many embedded applications. In this system we are going to monitor vehicles by using a fingerprint device which having a user data base accessing adopted by using the wireless fidelity module.by using this wireless fidelity module we can access the location of the vehicle when being loss. An LCD display is used in order to display the commands which are accessing by user under the influence of fingerprint module. We are going to control the vehicle by using an android app in mobile INTERNET OF THINGS and we can also unlock the vehicle by using fingerprint sensor manually even without having key.so these improves security parameters and these are user friendly which can easily access.

### INTRODUCTION:

from the last few decades day by day vehicle security is going is need to secured in a traditional to the digital world. With the help of the technological development we are able to secure the vehicles in digital nature. In the past decades the vehicle owners feels very hard to manage their vehicles when they are need to unlock the vehicles by starting the ignition to the motors. The vehicle owner need to unlock the motor by using the key but where as the people losses their key in some situations. Some of the last few interesting innovations are a wireless vehicle tracking system used to track vehicle whenever the vehicle is being theften(2)(7) , how much of the vehicle fuel tank is filled in order to maintain the car or any vehicle without any hesitations for the vehicle users(1). staring a car by using a finger print module and the theft controlling using the advanced technological

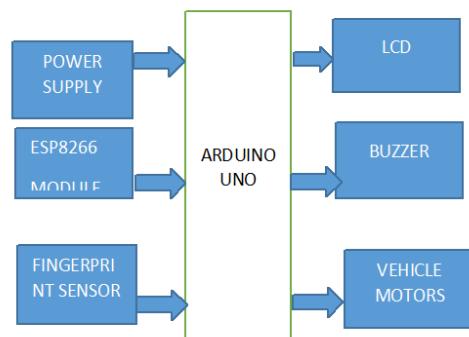
development(3)(4)(6). in our proposed model we are going to implement implement the a vehicle controlling using fingerprint module using ATMEGA328.

### PROPOSED MODEL:

Basically the vehicle users forgets to lock in that cases it is not under the secure conditions in that phenomenon we should monitor and control it.

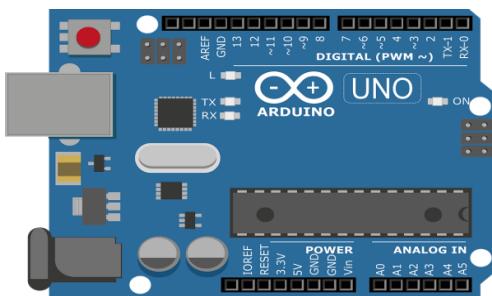
In this proposed model we are going to designing a system which is user friendly and helps vehicle users to maintain their vehicles in a secured manner. In wireless vehicle controlling system we are going to monitoring the vehicles using ESP8266 wireless module by using a finger print module we are going to collecting a biometric information and compared with user biometric information when these two are matched vehicle motor will be ON without using any key, whenever the vehicle motor is ON condition an information will be displayed.

### BLOCK DIAGRAM:



**FIG.BLOCK DIAGRAM REPRESENTATION**

### ARDUINO UNO:



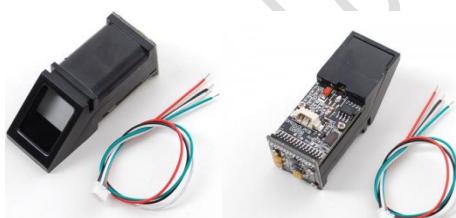
**FIG.2.Arduino uno pin diagram**

An arduino uno is the basic type of the arduino when compared to the arduino nano and arduino mega as well as arduino leonardo.it is also well known as the open source micro controller. The main advantage of the aurduino boards are we are able to connect arduino board to the computer by using the USB cable.

The general pin discription for the arduino uno microcontroller is as follows it consist 14 digital I/o pins which is generally known as general purpose I/o pins, 6 analog pins, 3 ground pins, one 5Volts and one 3.3Volts power supply pins, an analog reference pin(AREF), RESET pin and digital pin reference pin.

It works on the 16 mega hertzes working frequency. it consists of 32 kilobytes of flash memory and 2 kilobytes SRAM.

### FINGERPRINT MODULE:



**FIG.3.Fingerprint module**

Biometric module is the one of the device we can used in this project. Bio metric device is taken the input from the human being finger skin to compare to compare that input to the already stored data. The biometric device works on the basis of the details which is on the human skin by birth.First it is multiple people.In this module first the user is stored his data and after compared to that data to the input data.This module with TTL UART interfaced in the police department and other crime branches.In that

departments it is used for the identification of the criminals.Now a days the biometric is used in the education system also.Suppose for example students are used this in their attendance system etc,This device is used in our project also.For the vehicle controlling and vehicle safety purpose we can proposed this biometric device.This optical finger print reader or sensor is used for the identification of a right person from ce for the direct connections to a micro controller UART.This finger print module is directly connected to the 3.3 or 5v micro controller.For connection of the serial port of the micro controller we can used adaptor.

There are five pins are used for the connection of the this module.Those are:

5v: the arduino boards are works at the voltage of 5v power supply which is generally known as the output voltage.as we observe that the power supply board the incoming 230 v power supply will be converted to the 5v.

3.3 volts:the output current generated by this pin is maximum of the 50 MA of the current.

GND:Arduino consists of 3 Ground pins.

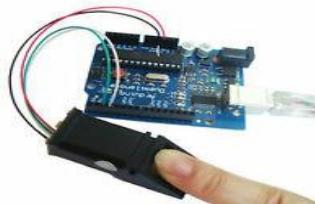
IOREF:it is generally known as the digital reference pin which having capable to enable either 5V or 3.3V power supply.

Reset: with the help of this pin we are able to get the restart or getting original initial position.

### WORKING PRINCIPLE:

Finger print includes two parts ,finger print enrollment and finger print matching.In enrolling,user needs to enter the finger two minutes.The system will process the two minutes finger images ,generates a templates of the finger based on processing results and store the templates.when matching ,user enters the finger through optical sensor and system will generate a template of the finger and compare it with already stored finger print image.

### CONNECTING WITH ARDUINO:



**FIG.4.Biometric Enrollment**

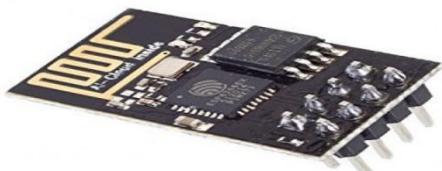
When it's comes to an Arduino project, probably we will need to download related libraries, then upload the enroll sketch to make the unit recognize your finger print. After writing of your project related instructions based on that this will be work. first store the finger print image in the form of binary code. after storing that another time the user put finger on the module to take that data and compare or processing when that data is right or not to tell that information. In our project when finger print is matching when the motor is on otherwise not respond .

### Wi-Fi MODULE:

Wi-Fi is defined as wireless fidelity. communication is defined as the information is transform between two objects.

Data is transform between source to destination.it is in two ways serial and parallel.in serial communication data is transfer bit by bite.Wi-Fi is internet based wireless communication network.it required some operating frequency it is 2.2GHz to 5GHz frequency range.data transfer rates is 1Mbps to 150Mbps over a distance of 100 to 300feets.

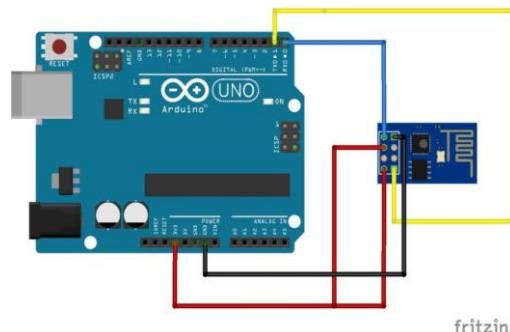
Here in this we can required ESP8266 Wi-Fi module.



**FIG.5.Wi-fi module**

ESP8266 is a wifi module which is developed by the ESPRESSIF system.these systems are widely developed in the IOT as the technical development.

ESP8266 module operating frequency is 2.4 GHz. It consist of an inter integrated circuit serial communication protocol ,an analog to digital conversion,serial peripheral interface serial communication protocol. inter IC sound interfaces with direct memory access. It is low cost environmental safety module for any developer.



**FIG.6.arduino interfacing with WI-FI module**

The above figure shows the connection between module and arduino uno .the pin description of ESP8266 is explain below.there are some pins are presented in this.those are,

3V3:3.3 POWER SUPPLY PIN.

GND:GROUND PIN.

RST:RESET PIN

EN:ENABLE PIN which active the system

TX:transmission pin

RX:receiving pin.

GPIO0&GPIO2:It is used for dedicate whether the transmitter and receiver pins are used for programming the module or for I/o purpose.

The operation of ARDUINO UNO with ESP8266 Wi-Fi module is given below :

1. Initially check the GPIO PIN on the ESP8266 whether it is connected to the FLASH button or not.
2. If the code is working perfectly then upload the project file.
3. Open the attached ARDUINO project.
4. Open the serial monitor, set the baud rate for ESP8266 which is 115200 .
5. Press the reset button then Compile and upload code.
6. If the flash fails try the above steps again.if the serial monitor is printing repeatedly if you can enter the password incorrectly.

## POWER SUPPLY:

Electronics mainly works on external power supply. Without giving any power supply we are unable to operate any single component and we are unable to study the experimental set up.

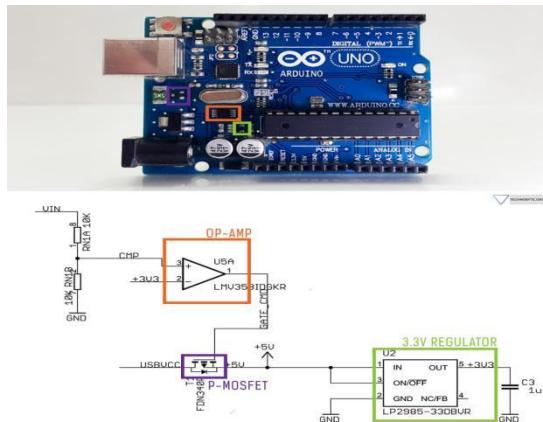


FIG.7.Power supply representation

The IC number for this arduini uno is ATMEGA328. it requires power supply for this ARDUINO UNO is 3.3v to 5v.The UNO is the one of the best board in order to start with any electronic equipment as well as codind..if this is first experience tinkering with the platform,the UNO is the most used and documented board of the whole ARDUINO family. the ARDUINO is micro controller board e are explained in detail in the above basic arduino explonation..the usage of bridge rectifier it is used to convert ac voltage to dc voltage.and also required code dumper is used to dump program to your hardware kit.and also used crystal oscillator is used to maintain the constant frequency levels and also required capacitor is connected in between that is used to remove if power contain small amount of ac,the capacitor can be removed that ac power and also required 7805 voltage regulator,the usage of that is to convert the 12 volts of dc voltage to 5 volts of dc power and also protect the board from the high voltages,at last one capacitor is required for elimination of ac power to get pure dc power at last out put of that power supply circuit.

## LIQUID CRYSTAL DISPLAY:

In this system we used a 16\*2 LCD display.

Basically LCD displays used for display

Purpose.



FIG.8.Liquid crystal display

The above figure shows the 16\*2 LCD display.the main purpose of the LCD display is used for the when the system is given required output or not weather given output properly or not.here 16\*2 represents 16 said that columns and 2 said that row

Pin no.1:VSS(ground)-Ground pin

Pin no.2:VDD(+5volt)-It used to lighten the LCD with an voltage of 5V.

Pin no.3:VE(contrast V)-this pin decides the how much contrast is appearing.

Pin no.4:register select-connected to micro controller to shift between command or data register.

Pin no.5:read/write pin :this pin uses for either the read the input data or to write the required data at output.

Pin no.6:enable-without actuating this enable the total component will not going to be actuated.

Pin no.7:this is the data pin which shows the 8 bits of the data for the acknowledgement.

Pin no.15 and Pin no 16:

LCD backlight led pin positive and negative terminals.

## FEATURES OF 16\*2 LCD DISPLAY:

In this 16\*2 LCD DISPLAY there are 16 vertical lines and two horizontal lines. In these displays the basic type of the character LCD display is used in our proposal. It can have a capable to store 16 character values. In each single bit of the character it can able to store 5\*8 size. The LCD displays are may have a different colors such as green and blue.

## BUZZER:

A buzzer or beeper is an audio signaling device.which may be mechanical or electro mechanical or piezoelectric.Typical uses of buzzers and beepers include alarms devices,timers and conformation of user input such as a mouse click.

The electric buzzer was invented in 1831 by Joseph Henry. They were mainly used in early doorbells until they were phased out in the early 1930 in favour of musical chimes, which had a softer tone.

Piezoelectric buzzer, or Piezo buzzers, as they are sometimes called, were invented by

Japanese manufacturers and fitted into a wide array of products during the 1970s to 1980s.

#### DC SERVOMOTOR:



**FIG.10.DC servomotor**

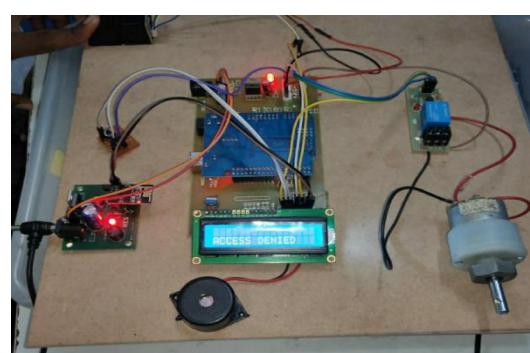
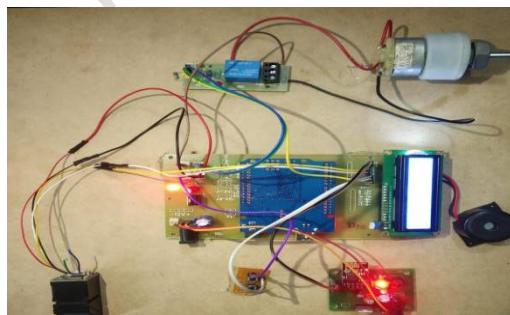
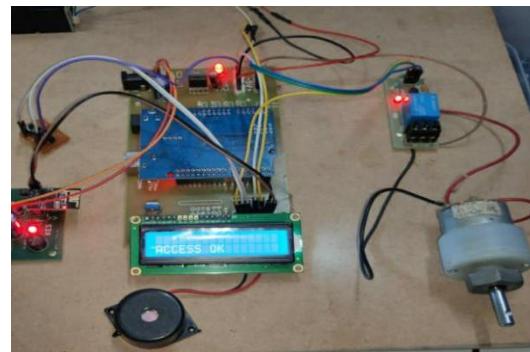
A DC servomotor is a rotatory actuator, it can allow for precise control of angular or linear position.

Whenever the finger print data matches with the present input then only the motor will be ON and also an indication for the starting of the motor will be displayed on the LCD DISPLAY otherwise buzzer will be activated with an indication of someone trying to access the vehicle.

#### EXPERIMENTAL RESULTS:

In this proposed model we have implemented a wireless vehicle controlling system by using a fingerprint module with the help of an android app TELNET.

The output results for this system are as follows.



When ever the switch is ON condition the finger print module enrolling the data in digital format and stores data in memory which is EEPROM. When ever data is matched with stored data then the vehicle 77motor will be ON. In case of mismatching appears an indication on LCD display will displays such that ACCESS DENIED and buzzer will be ON. In this biometric module we are able to store the 1024 fingerprints data .when ever we are reconnecting the powersupply the stored data will be collect the data from the initial position.

#### **CONCLUSION:**

as we explained in detail above by using this model we are able to unlock the vehicle by using the biometric information and also we are going to access the location of the when ever vehicle being stolen. The vehicle safety is going to be improved and it is a easily system which is for implementation.

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