Driving License Management System Using Finger Print Sensors with Seat Belt Monitoring System

N.Vimala[1], S.Girinath[2], E.Sabarivasagan[3], P.Sivaprasath[4], V.Kanish[5], R.Santhosh[6], K.J.Chirangivi[7]

[1] *Senior Lecturer, Department of ECE, Nanjiah Lingammal Polytechnic College, Mettupalayam, Tamilnadu, India*

[2,3,4,5,6,7] *Students, Department of ECE, Nanjiah Lingammal Polytechnic College, Mettupalayam, Tamilnadu, India*

Abstract: The finger print based driving license management is an advanced technology that is designed for security purposes. This system consists of a fingerprint sensor, which is used to identify the status of the driver, whether he/she obtained a license or not. This is a very highly secured system. The driver's fingerprint is already stored in the system for comparison purposes. Nowadays, accidents are increasing day by day. In the recent days minor people are driving the vehicles without the license; this may cause future accidents. In order to conquer this, we proposed this system. This system not only checks the license status, and here a further IR sensor is used to check whether the seat belt wore or not. By using this system, there are tremendous advantages, like accidents will be reduced, high security, and reduced vehicle theft.

Keywords: Finger print sensor, microcontroller, and IR sensor.

1. INTRODUCTION:

The driving license is also known as a driver's license, issued by the vehicle department. It is used to authorise an individual people to operate a vehicle like a car, bike, bus, etc. on the road, and it confirms the driver's identity and eligibility to drive. A driving license serves in alliance with traffic laws and regulations. There are more types of licenses, namely learners. permit license, provisional license, full license, commercial driver's license (CDL) and International Driving Permit (IDP). In the government of India, the driving license is issued by the Regional Transport Office, Department of Motor Vehicle (DMV), Driver and Vehicle Licensing Agency(DVLA). In India, driving without license is always a major issue. According to the study, many accidents happened by unlicensed drivers. In India, minor peoples are driving the vehicles without fear, so accidents are increased, and people are scared by the fast driving of people. Without a license, many problems will rise like, fines, imprisonment, no accident claims, obstructing duties, and vehicle seizure, etc. In order to conquer this problem, we proposed a new system which consists of a fingerprint sensor. In the system, the default fingerprint of the driver is stored. When The driver keeps his finger print, it compares to the default finger print and kept print when it gets matched, the ignition gets ON. When the finger print doesn't match, the ignition didn't get ON. Additionally, an IR sensor is used to monitor whether the driver wear the seat belt or not. This system consists of various advantages, like high security, accidents will be reduced.

2. LITERATURE REVIEW:

+ From journal: **International Journal of Engineering and Technology (IRJET) | Volume 08| Special issue| OCT 2021| e- ISSN: 2395-0056| p- ISSN: 2395-0072|**

+ In the above journal the system does not consists of IR sensor.

3. PROBLEM STATEMENT:

In the above journal they done their project entitled **"Fingerprint Authorization based Driving License Checking System"**. In this project, that only monitors the driver license authorization. Here security system is not introduced but in our project we introduced an additional security system which is used to monitor the driver whether he wear seat belt or not, for monitoring the seat belt IR sensor is used for the process. By using IR sensor security will be increased and driver will be protected by the accidents.

4. PROPOSED METHOD:

In order to monitor the vehicle with security. We proposed a system entitled "Driving License Management System Using Fingerprint Sensor with seat belt monitoring System". It is used to monitor the license status of drivers via a fingerprint sensor. In this system, fingerprint sensor, IR sensor, motor, and buzzer is used for processing. Driver's fingerprint is stored as default. Whenever the driver kept his finger on the fingerprint sensor, the sensor compared the default fingerprint and recently kept a fingerprint. After comparison, when the fingerprints are same, the engine gets 'ON'. We can start the vehicle and move it onto the road. When the fingerprints are different, the buzzer starts giving a sound to indicate the fingerprint is not the same. For protection, an IR sensor is used to check whether the driver wears the seat belt or not. By using this protection increased, and number of accidents will be reduced.

5. OBJECTIVES OF THE PROPOSED SYSTEM:

- To prevent unlicensed driving
- To identify the fake users
- To identify the unregistered vehicles
- To prevent the fines
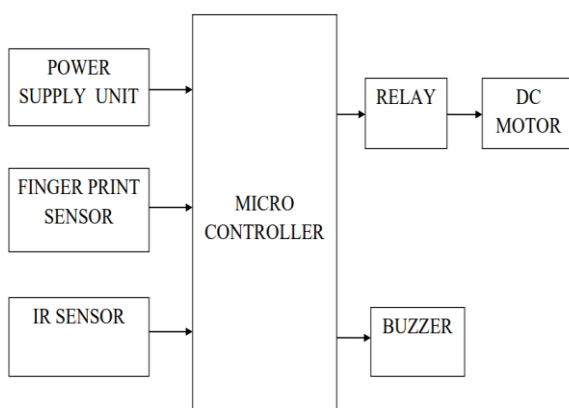- To reduce the road accidents

6. BLOCK DIAGRAM:

Figure-1: Block diagram

6.1. COMPONENTS USED IN BLOCK DIAGRAM:

- Microcontroller
- Finger print sensor
- IR sensor
- Buzzer
- Relay
- DC motor

6.2. EXPLANATION ABOUT BLOCK DIAGRAM:

1. PIC16F877 Microcontroller:

Figure-2: PIC Microcontroller

It is an 8-bit microcontroller; it contains 40 pins. It is fully based on flash-type memory. It consists of high-performance RISC CPU inside it. It consists of 256 bytes of EEPROM data memory, 368 bytes of SRAM, and 14 K of program memory. It mainly consists of 3 timers. Timer 0, Timer 1, Timer 2. Its clock speed is up to 20MHz. 5 ports are available in this microcontroller. There are 14 interrupt sources in it. It operates from 4 to 5.5 v.

2. Fingerprint sensor:

Figure-3: Finger print sensor

A fingerprint sensor is a biometric device that is used to analyse an individual unique fingerprint pattern. It is used to verify identity, authenticate access, and provide security. There are four types of fingerprint sensors available: optical sensors, capacitive sensors, ultrasonic sensors, and thermal sensors. Technologies used in the fingerprint are machine learning, artificial intelligence, and biometric

encryption. By using fingerprint sensors, there are more advantages, like fast recognition, non-invasiveness, and enhanced security.

3. IR Sensor:

Figure-4: IR sensor

An IR sensor is used to detect the infrared radiation that is reflected from any object. It is used to measure temperature, detect motion, identify the object, and sense proximity. There are four types of IR sensors, photodiodes, phototransistors, thermopiles, and pyroelectric sensors. It works on the principle of infrared emission and signal processing. The advantages of using an IR sensor are high accuracy and low power consumption.

4. Buzzer:

Figure-5: Buzzer

A buzzer is one type of electronic circuit that is used to produce a sound signal when it gets activated. It is used to convert electrical signals into sound signals. There are four types of buzzers: mechanical buzzers, active buzzers, passive buzzers, and piezoelectric buzzers. It works on the principle of electromagnetism. The advantages of the buzzer are low cost, smaller in size, and low power consumption.

5. Relay:

Figure-6: Relay

Relay is an electrically controlled switch. It is used for switching purposes and also to isolate the low DC supply and high AC supply. There are 6 types of relays in an electrical system, for example, electromechanical relays, latching relays, and non-latching relays. Advantages of the relay are low power consumption, high reliability, and compact size. Here it is used to control the DC motor.

6. DC motor:

Figure-7: DC motor

A DC motor is an electrical machine family that is used to convert input electrical signal into output rotational signal. Here a DC motor acts as a wheel. There are 5 types of DC motors: PMDC motor, series wound DC motor, shunt wound DC motor, compound wound DC motor, and BLDC

motor. Advantages of the DC motor are simple design, low cost, compact size, and high torque speed.
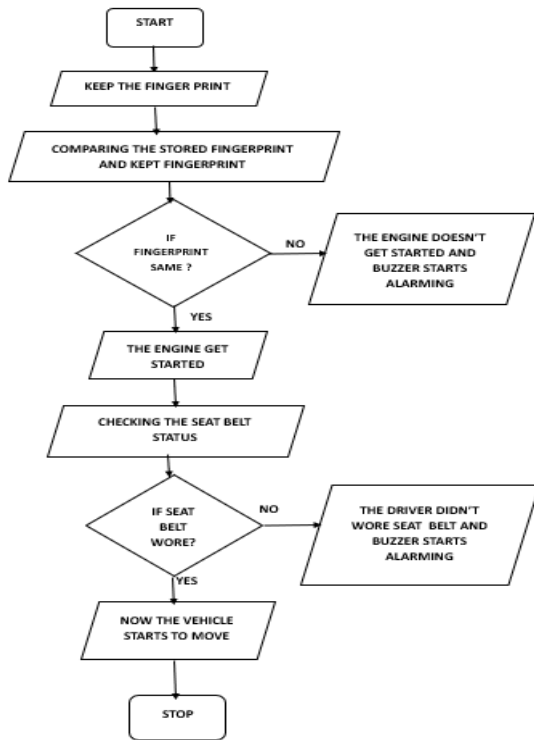
7. FLOW DIAGRAM OF THIS SYSTEM:

Figure-8: Flow diagram

7.1. Algorithm for flow chart:

Step1: Start

Step 2: Keep the finger print on the fingerprint sensor.

Step 3: Comparing the default fingerprint and the kept fingerprint

Step 4: If "yes," the engine gets started.

Step 5: If "no", the engine doesn't get started and the buzzer starts alarming.

Step 6: Checking the status of the seat belt

Step 7: If "yes," now the vehicle starts to move.

Step 8: If "no," the driver didn't wear a seat belt then the buzzer starts alarming

Step 9: Now the vehicle gets ready for moving with full security.
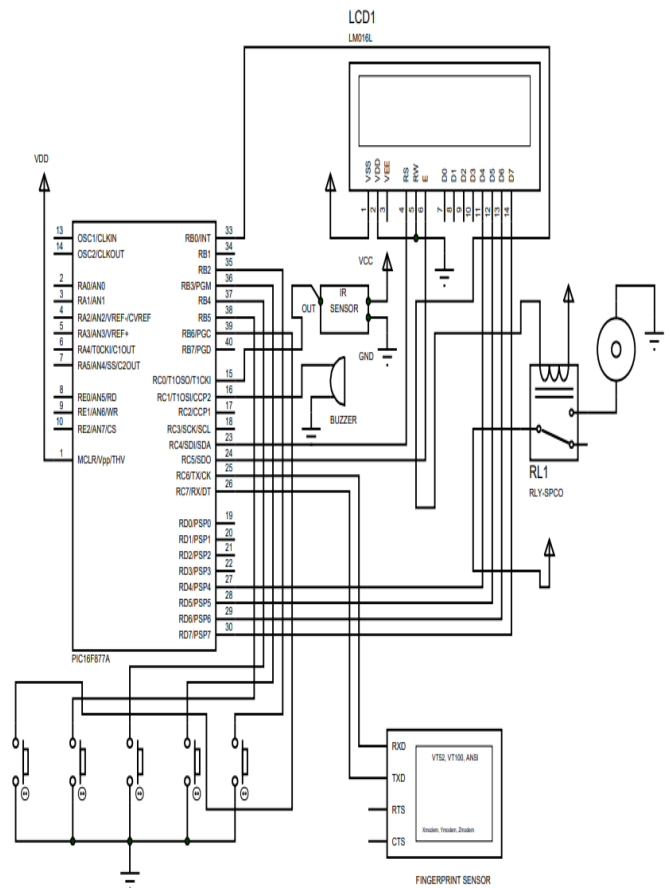
8. CIRCUIT DIAGRAM:

Figure-9: Circuit diagram

8.1. Construction of the circuit diagram:

Here a PIC microcontroller is used for the process. At 1st pin of the microcontroller is connected to VDD. RB0/INT It is the 33rd pin in the microcontroller, it is used to trigger the relay, and it is also used for switching the relay. The 15th pin of the PIC microcontroller is connected to an IR sensor. The output from the IR sensor is fed to the 15th pin, VCC, and ground connections. are made to the IR sensor. The 16th pin of the microcontroller is connected to the buzzer circuit and proper ground connection is made to buzzer. The pin RD5, RD6, RD7 it is connected to an LCD display, which is used to produce the output. The RX pin of the finger print sensor is connected to TX pin of the microcontroller and TX pin of the fingerprint sensor is connected to the RX pin of the microcontroller. Reset circuit is made for reset purposes. Dc motor is switched by relay.

8.2. Working of the circuit diagram:

Whenever the power supply gets "ON," the microcontroller starts working. The fingerprint is under the process. IR sensor sense the signal. When the driver kept his finger print on the fingerprint sensor The fingerprint sensor compares the default fingerprint and recently kept fingerprint then produce the output. If the finger print gets matched now the motor gets "ON" and starts to move. If the fingerprint of the sensor is not same then the engine of vehicle is not started, the vehicle cannot move. IR sensor is used to check whether the driver wear seat belt or not. LCD display is used to produce output in display form.

8.3. Advantages of the system:

- ✓ Reduced theft
- ✓ By using this system continuous authentication
- ✓ High security
- ✓ Accidents will be reduced
- ✓ Accountability is good
- ✓ Streamlined verification

8.4. Applications of this system:

- ✓ It is used in cars.
- ✓ It is used in buses.
- ✓ It is used in trucks.
- ✓ It is used in bikes.

9. CONCLUSION:

Nowadays, development of science and technology is a non-stop process. New technologies, new developments, and new inventions are increased day by day. We must imagine our future. Driving license is must for all peoples who are all above 18 years old. Driving license should be considered to avoid accidents. In order to conquer this, we proposed a new system to reduce accidents and to increase protection. In the upcoming days all should obtain driving license without Fail. The major advantages of this system, theft will be reduced.

10. REFERENCES:

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AUTHORS:

VIMALA.N, Senior Lecturer, Department of Electronics and Communication Engineering, Nanjiah Lingammal Polytechnic College, Mettupalayam.

GIRINATH.S, Student, Third year, Department of Electronics and Communication Engineering, Nanjiah Lingammal Polytechnic College, Mettupalayam.

SABARIVASAGAN.E, Student, Third year, Department of Electronics and Communication Engineering, Nanjiah Lingammal Polytechnic College, Mettupalayam.

SIVAPRASATH.P, Student, Third year, Department of Electronics and Communication Engineering, Nanjiah Lingammal Polytechnic College, Mettupalayam.

KANISH.V, Student, Third year, Department of Electronics and Communication Engineering, Nanjiah Lingammal Polytechnic College, Mettupalayam.

SANTHOSH.R, Student, Third year, Department of Electronics and Communication Engineering, Nanjiah Lingammal Polytechnic College, Mettupalayam.

CHIRANGIVI.K.J, Student, Third year, Department of Electronics and Communication Engineering, Nanjiah Lingammal Polytechnic College, Mettupalayam.