A Prototype of Fingerprint Based License Authentication of Vehicles

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Abstract—To prevent non license from driving and therefore causing accident a new system is proposed. An important and very reliable and human identification method is finger print identification method. Finger print identification is one of the most popular and reliable personal biometric identification method. The proposed system consists of a smart card capable of storing the fingerprint of particular person. While issuing the license, the specific person fingerprint is to be stored in the card. Vehicles such as car, bike etc should have card reader capable of reading the particular license. The same automobile should have the facility of fingerprint reader device. A person who wishes to drive vehicles, should show the license card in front of the reader, he/she can proceed for ignition. Otherwise will not work. Moreover the seat belt detectors verifies and then prompts the user to wear the seat belt before the driving. This increases the security of vehicles also ensures the safe driving prevents for safe driving.

1. Introduction

The license issued by the Government is a smart card which stores different fields such as name, license no., date of expiry, fingerprints of 10 fingers, type of license and blocked status of the license as well as fingerprint templates. Unlicensed driving is a matter of concern for several reasons. It is possible that drivers who have not undergone appropriate training and testing may be deficient in some aspect of the knowledge and skills required to drive safely and efficiently. Also, drivers who are unauthorized may have less incentive to comply with road traffic laws in that they would not be influenced by the rewards and penalties set up under the licensing system.

Fingerprint identification system consisting of image acquisition, edge detection, thinning, feature extractor and classifier. The biometric fingerprint sensor takes a digital picture of a fingerprint. The fingerprint scan detects the ridges and valleys of a fingerprint and converts them into ones and zeroes. Step for Finger print recognition. Embedded Technology is now in its prime and wealth of knowledge available is mind blowing. An embedded system can be defined as a control system designed to perform a specific task. Common examples of embedded system include automatic washing machine, navigation system on aircraft and intruder alarm systems. An embedded system can also be defined as single purpose computer.

Embedded systems are used for real time applications with high reliability, accuracy and precision, embedded systems are operated with real time operating systems like WinCE, RT Linux, VX Works, PSOS, etc. Embedded systems are very popular these days most of the electrical, electronics, mechanical, chemical, industrial, medical, space and army more areas have the systems in their applications. Most embedded systems are time critical applications meaning that the embedded system is working in an environment where timing is very important. The results of an operation are only relevant if they take place in a specific time frame alarm systems. This project work is under the domain of embedded system. The coding has been done through embedded c programming. It is easy to deal, compact and highly reliable.

2. Problem Statement

Unlicensed driving causes number of accidents in our day to day life. In earlier days, license checking needs manual as it involves separate policeman to check the license details. But it was time consuming and it also leads to inaccurate checking and can leads to bribing.

Later, verification of license is done by comparing the license details with the database by using barcode scanner. License can be made using RFID tag and the verification is done using RFID reader it doesn’t provide any security feature and faking of the RFID tag is also possible. Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically stored information. Passive tags
collect energy from a nearby RFID reader’s interrogating radio waves. Active tags have a local power source such as a battery and may operate at hundreds of meters from the RFID reader. Unlike a barcode, the tag need not be within the line of sight of the reader, so it may be embedded in the tracked object. RFID is one method for Automatic Identification and Data Capture (AIDC).

RFID tags are used in many industries, for example, an RFID tag attached to an automobile during production can be used to track its progress through the assembly line; RFID-tagged pharmaceuticals can be tracked through warehouses; and implanting RFID microchips in livestock and pets allows positive identification of animals. Since RFID tags can be attached to cash, clothing, and possessions, or implanted in animals and people, the possibility of reading personally-linked information without consent has raised serious privacy concerns.

The RFID Proximity Reader Module has a built-in antenna in minimized form factor. It is designed to work with standard carrier frequency of 125 kHz. This LF reader module with an internal or external antenna facilitates communication with Read-Only transponders—type UNIQUE or TK5530 via the air interface. The tag data is sent to the host systems via the wired communication interface with a protocol selected from the module. Both RS232 and Wigged Protocol. The LF module is best suited for applications in Access Control, Time and Attendance, Asset Management, Handheld Readers, Immobilizers, and other RFID enabled applications.

3. Related Work

The fingerprint based licensed system using RFID tag is implemented in this project. A RFID tag was issued to the people instead of the old license card and the database was created with the license details and can be verified using RFID reader. In addition to this, a fingerprint sensor is deployed on the car, thumb impression of the license holder has to be collected and stored in the same storage.

The system is designed in such a way that the vehicle (4 wheeler) can only be started when the license holder shows their RFID card to their RFID reader and it verifies the license information and then they should place their thumb impression in the fingerprint sensor which matches the impression details with the license details and allows the user to start the car engine. So that only license holder can drive the vehicle and unlicensed driving can be completely eradicated. We are storing the vein image the smart license. We are showing the license in RFID reader and microcontroller get the data from the card stored in EEPROM vice versa for fingerprint module also and compare the fingerprint image of a user with predefined images both the images are to start the car.

![Image](image.png)

Fig. 3.1 Finger print generation

4. LCD Display

It is a flat-panel display or other electronic visual display that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images with low information content, which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements. LCDs are used in a wide range of applications including computer monitors, televisions, instrument panels, aircraft cockpit displays, and signage.

The LCD screen is more energy-efficient and can be disposed of more safely than a CRT. Its low electrical power 1888. By 2008, annual sales of televisions with LCD screens exceeded sales of CRT units worldwide, and the CRT became obsolete for most purposes.

LCD Diagram:
4.1 Software Analysis

Compilers are programs used to convert a High Level Language to object code. Desktop compilers produce an output object code for the underlying microprocessor, but not for other microprocessors. I.E the programs written in one of the HLL like ‘C' will compile the code to run on the system for a particular processor like x86 (underlying microprocessor in the computer). For example compilers for Dos platform is different from the Compilers for Unix platform.

So if one wants to define a compiler then compiler is a program that translates source code into object code. The compiler derives its name from the way it works, looking at the entire piece of source code and collecting and reorganizing the instruction. See there is a bit little difference between compiler and an interpreter. Interpreter just interprets whole program at a time while compiler analyzes and execute each line of source code in succession, without looking at the entire program.

The advantage of interpreters is that they can execute a program immediately. Secondly programs produced by compilers run much faster than the same programs executed by an interpreter. However compilers require some time before an executable program emerges. Now as compilers translate source code into object code, which is unique for each type of computer, many compilers are available for the same language.

5. Conclusion

The proposed system makes sure that the vehicle should be driven only by authorized person who holds the license. It reduces the manual work needed for checking the license and it makes availing of license as mandatory since they can’t drive the car without license. By implementing this system, the rate of accident caused by unlicensed driving can be reduced and the government rule of mandatory license system can be realized.

Before we are using a ordinary card for license .so every person can drive the vehicle without license against the government rule . And to many accidents are happening now a days. In order to avoid the accidents for that only we developing this project .so our project makes every person to have license without license they cannot drive the car.

6. Future Work

In future the police man having the RFID reader his hand and check the vehicle crossing him on the road side. So police man can easily identify the person license expired or not

7. References

[1] “Web-based student attendance system using RFID technology” presented by M. Kassim; H. Mazlan; N. Zaini; M. K. Salleh at Control and System Graduate Research Colloquium (ICSGRC), 2015 IEEE.