ISSN: 2277-9655
Impact Factor: 1.852

IJESRT

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY

Fingerprint Based Driving Licensing Authentication System Using FPGA Implementation

M. Ramkumar
Department of ECE, M.Tech VLSI Design, Bharath University, Chennai, India
rammanoharece@gmail.com

Abstract

To prevent non-licensees from driving and causing accidents, a new system is proposed. An important and very reliable human identification method is fingerprint identification. Fingerprint identification is one of the most popular and reliable personal biometric identification methods. The proposed system consists of a data base it storing the fingerprint of particular person. While issuing the license, the specific person's fingerprint is to be stored in the data base. Vehicles such as cars, bikes etc should have a finger print reader and have capable to read the particular persons license details. In this system every automobile should have the facility of fingerprint reader device. A person, who wishes to drive the vehicle, should swipe his/her finger (license) in the vehicle. If the finger print stored in the card and fingerprint swiped in the device matches, he/she can proceed for ignition, otherwise ignition will not work. Moreover, the seat belt detector verifies and then prompts the user to wear the seat belt before driving. This increases the security of vehicles and also ensures safe driving by preventing accidents.In case the car is started by the influence of valid licensed person. There is a chance to change the driver. So we are additionally improving our license verification system in rad side also by the help of police verification system.

Keywords: Safe Driving, FPGA, Fingerprint, RS 232, Histogram Equalization

Introduction

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.On this argument, drivers who do not hold a valid license may disregard the threat of license sanctions or the benefits of reduced insurance premium due to not having made a claim. It is noticeable in the literature [1] that the term "unlicensed" is used interchangeably to mean one of the below subcategories, as follows:

Fingerprint Module

The ARA-EM01 is high performance fingerprint module developed by Aratek Biometrics Technology Co, Ltd .it has many features : easy restructure, powerful functions, compatible with PC, and multiple-functions in one module: Fingerprint enrollment, image process, characters acquisition, fingerprint template creation, fingerprint template storage, fingerprint compare (1: 1, 1: N), fingerprint delete. This module can work with different devices based on UAWRT such as PC, SCM and so on. Only easy circuits and fingerprint module can enhance your product into fingerprint authentication power. It is widely used by electronics business, information security, access control, identity authentication and other security industry.

Fig 1. Fingerprint device

ISSN: 2277-9655
Impact Factor: 1.852

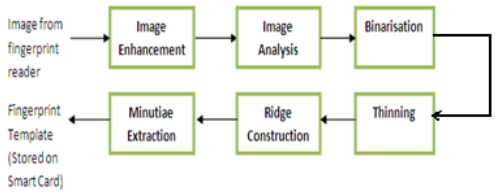

Fig 2. Fingerprint Template Generation

Application Solution

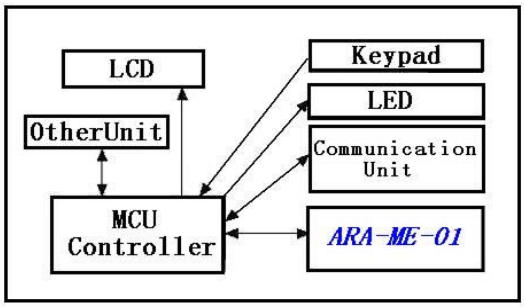

Fig 3. Application Solution of Fingerprint Module

When ARA-EM01 is embedded into your system, the other functions will be controlled by MCU Controller, so developer can realize his own function logic, user interface and communication port through hard ware and soft ware development, such as fingerprint time and attendance and so on.

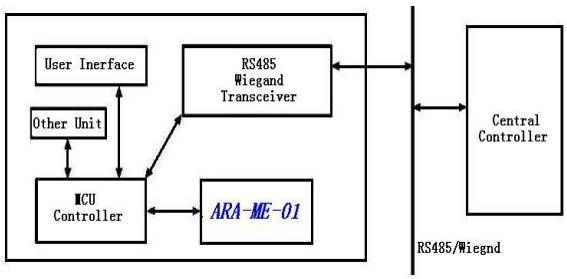

Fig 4. Reciever Section

Block Diagram of the Proposed Method

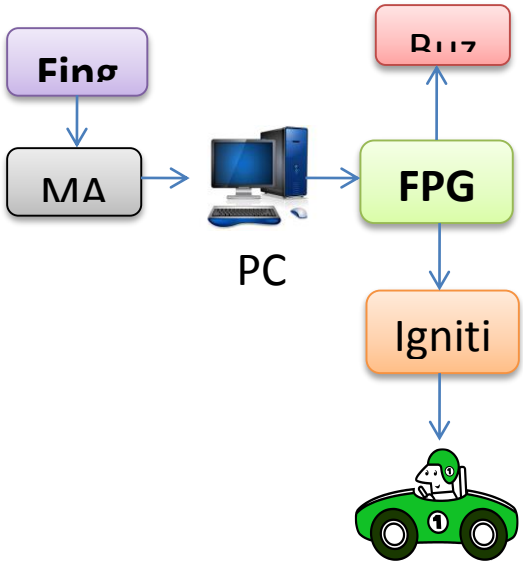

Fig 5. block diagram

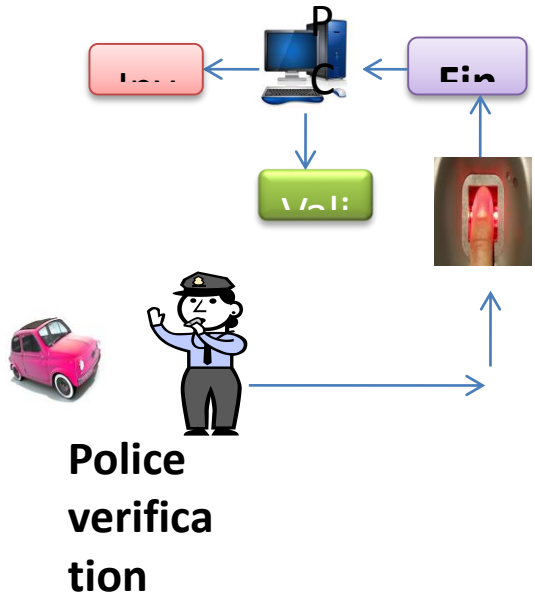

Fig 6. Police verification

Existing System

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

ISSN: 2277-9655
Impact Factor: 1.852

under the licensing system. On this argument, drivers who do not hold a valid license may disregard the threat of license sanctions or the benefits of reduced insurance premium due to not having made a claim. It is noticeable in the literature [1] that the term "unlicensed" is used interchangeably to mean one of the below subcategories, as follows:Drivers who drive but who have never possessed any form of license;Drivers who have previously held a license but who have been disqualified; andDrivers possessing only a provisional license but whom, nevertheless, drive unaccompanied.

Proposed System

The vehicle can be ensured that it is been driven only by the authorized persons.The system also provides facility for the learner's licensees to drive by keeping a licensed person near them.In cars, it also ensures that the seat belt is worn by the driver, so that it adds the safety feature to cars.It would be of great use for the safety of drivers and irregularities can be kept at check without any loopholes.

Fingerprint Processing

Fingerprint Enhancement

Fingerprint enhancement is to make the clearer for easy further operations. Since the fingerprint s acquired from sensors or other medias are not assured with perfect quality, those enhancement methods, for increasing the contrast between ridges and furrows and for connecting the false broken points of ridges due to insufficient amount of ink, are very useful for keep a higher accuracy to fingerprint recognition.Two Methods are adopted in my fingerprint recognition system: the first one is Histogram Equalization; the next one is Fourier Transform.

Histogram Equalization

Histogram equalization is to expand the pixel value distribution of an so as to increase the perceptional information. The original histogram of a fingerprint has the bimodal type [Figure 3.1.1.1], the histogram after the histogram equalization occupies all the range from 0 to 255 and the visualization effect is enhanced

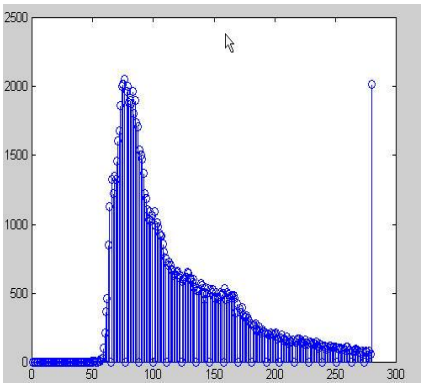

Fig 7 (4.1) Original Histogarm of a Fingerprint

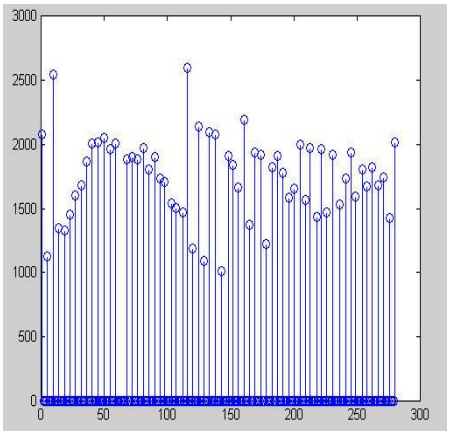

Fig 8 (4.2) Histogram after the Histogram Equalization

Conclusion

The above input and output analysis of the proposed system proves that the vehicle can be ensured that it is been driven only by the authorized person. The system also provides facility for the learner's license to drive by keeping a licensed person near them.It also gives time to get the system repaired if any malfunction exists.In cars,it also ensures that the seat belt is worn by the driver,so that it adds the safety feature to cars. Though implementation of the proposed system may take time,it would be of great use for yhe safety of drivers and irregularities can be kept at check without any loopholes.The developed prototype seves as an impetus to drive future research ,geared towards developing a more robust and embedded real-time fingerprint based driving licensing system in vehicles.

ISSN: 2277-9655
Impact Factor: 1.852

References

[1] *Ross, K. Nandakumar, and A. Jain, Handbook of Multibiometrics. New York: Springer-Verlag, 2006, New York Inc.*

[2] *D. Maltoni, D. Maio, A. Jain, and S. Prabhakar, Handbook of Fingerprint Recognition. New York: Springer-Verlag, 2009, New York Inc.*

[3] *A. Othman and A. Ross, "Mixing fingerprints for generating virtual identities," in Proc. IEEE Int. Workshop Information Forensics and Security (WIFS), Foz do Iguacu, Brazil, Nov./Dec. 2011.*

[4] *R. Cappelli, "Sfinge: Synthetic fingerprint generator," in Proc. Int. Workshop Modeling and Simulation in Biometric Technology, 2004, pp. 147–154.*

[5] *A. Jain, A. Ross, and U. Uludag, "Biometric template security: Challenges and solutions," in Proc. Eur. Signal Processing Conf. (EUSIPCO), 2005, pp. 469–472.*