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## Survey on Finger Print Based Authentication System

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**ABSTRACT:** To prevent non-license from driving, a new system is proposed. The proposed system consists of a smart card capable of storing the fingerprint of particular person. While issuing the license, the specific person's fingerprint is to be stored in the card. Vehicles such as cars, bikes etc. should have a card reader capable of reading the particular license. The same auto mobile should have the facility of fingerprint reader device. A person, who wishes to drive the vehicle, should insert the card (license) in the vehicle and then swipe his/her finger. If the fingerprint 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 varies 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.

**KEYWORDS:** Fingerprint, fingerprint reader, License, Ignition system, Smart Card, Safe Driving

### I. INTRODUCTION

Unlicensed driving involves sympathy toward a few reasons. It is conceivable that drivers who have not experienced proper preparing and testing might be insufficient in some part of the information and aptitudes required to drive securely and proficiently. The term "unlicensed" is utilized reciprocally to mean one of the beneath subcategories, as takes after:

- A) Drivers who drive however who have never had any type of permit;
- B) Drivers who have already held a permit however who have been precluded; and
- C) Drivers having just a temporary permit however, whom, by and by, drive unaccompanied.

For some unlicensed drivers, requirement and punishments are not solid hindrances and furthermore there are additionally regulatory escape clauses which some exploits. There gives off an impression of being a general laxity in the arrangement of checking the legitimacy of records and their possession for instance it is asserted to be clear for an unlicensed driver to pass himself off as a companion (with a permit) and later present the companion's archives at a police headquarters.

Outline a framework to keep non authorized individual from driving. Principle aphorism behind innovation is creating secure driving framework for client. Client can drive the specific vehicle just when his/her fingerprints matches with the put away one. The real target of the venture is secure driving in application in the public eye.

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The extend destinations are partitioned into two noteworthy undertakings:-

- a) To give efficient driving framework.
- b) To give proficient coordinating between spared fingerprint on savvy card with clients fingerprint.

Section I describes the Literature survey and Section II describes methodology, conclusion in Section III, References in section IV.

## II.LITERATURE SURVEY

### 1. Convolutional Neural Network:

In machine learning, a convolutional neural network (CNN, or ConvNet) is a type of feed-forward artificial neural network in which the connectivity pattern between its neurons is inspired by the organization of the animal visual cortex. Individual neurons of the animal cortex are arranged in such a way that they respond to overlapping regions tiling the visual field, which can mathematically be described by a convolution operation. Convolutional networks were inspired by biological processes and are variations of multilayer perceptron designed to use minimal amounts of pre-processing. They have wide applications in image and video recognition, recommender systems and natural language processing. The convolutional neural network is also known as shift invariant or space invariant artificial neural network (SIANN), which is named based on its shared weights architecture and translation invariance characteristics.[1]

### 2. Finger print matching algorithm:

**(a) Histogram Equalization:** Histogram equalization is to expand the pixel value distribution of an image so as to increase the perception information. The original histogram of a fingerprint image has the bimodal type the histogram after the histogram equalization occupies all the range from 0 to 255 and the visualization effect is enhanced.

**(b) Fourier Transform:** Because the image in the Fourier domain is decomposed into its sinusoidal components, it is easy to examine or process certain frequencies of the image, thus influencing the geometric structure in the spatial domain.

**(c) Binarization:** A locally adaptive binarization method is performed to binarize the fingerprint image. Such a named method comes from the mechanism of transforming a pixel value to 1 if the value is larger than the mean intensity value of the current block (16x16) to which the pixel belong.

**(d) Direction:** Field orientation and filtered field orientation map computation, which consists of the calculation of the dominant direction of ridges and valleys in each local region.

**(e) Region of Interest (ROI):** Two Morphological operations called OPEN and CLOSE are adopted. The OPEN operation can expand images and remove peaks introduced by background noise. The CLOSE operation can shrink images and eliminate small cavities.

**(f) Thinning:** The built-in Morphological thinning function in MATLAB is used for ridge thinning. The thinned ridge map is then filtered by other three Morphological operations to remove some H breaks, isolated points and spikes.

**(g) Matching:** A bounding box is placed around each template minutia. If the minutia to be matched is within the rectangle box and the direction discrepancy between them is very small, then the two minutia pair is regarded as a matched minutia pair. Each minutia in the template image either has no matched minutia or has only one corresponding minutia. The number of matched minutia pair is calculated as percentage of matching.[2]

### 3. Triangular Matching:

In order to define an effective matching technique, a deformation model must be identified. When looking at different images containing the same fingerprint, a strong global deformation of the images can be observed. This distortion is due to static friction on a sensor surface, or paper, or rolling of the finger during ink-based registration techniques.

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However, small portions of the images do not appear to exhibit manifest distortion. The idea of how to take into account small local variations, which may lead to huge global distortion.[3]

#### 4. Development of Personal Authentication System Using Fingerprint

With Digital Signature Technologies In biometrics-based personal authentication, biometric data that is to be used for reference in comparison (referred to as template data) is registered in advance in the same way as when passwords are used. In the authentication processing, another biometric data that was input from a sensor is compared with the preregistered template data and a degree of similarity is calculated. This degree of similarity serves as the basis for deciding whether or not this person is the authorized person. Personal authentication technology that uses biometrics checks. For the authorized person by means of image (or signal) processing techniques. For this reason, personal authentication may not be possible for characteristic information that is outside the assumptions of the sensors or algorithms.[4]

#### 5. A fingerprint recognizer using fuzzy evolutionary programming:

A fingerprint recognizing system is built with two principal components: the fingerprint administrator and the fingerprint recognizer. Fingerprints are identified by their special features such as ridge endings, ridge bifurcation, short ridges, and ridge enclosures, which are collectively called the minutiae. The fingerprint administrator uses the method of gray scale ridge tracing backed up by validating procedure to extract the minutiae of fingerprints. The fingerprint recognizer employs the technique of fuzzy evolutionary programming to match the minutiae of an input fingerprint with those from a database. Experimental results show the methods used are highly effective.[5]

#### 6. A survey on fingerprint biometric recognition system:

Individual recognition is based on biometric characteristics. A biometric system is an automated method of recognizing an individual. It is an evolving technology which is used in various fields like forensics, secured area and security system. Fingerprint method of identification is the oldest and widely used method of authentication used in biometrics. Fingerprint Recognition system designed uses various techniques in order to reduce the False Acceptance Rate (FAR) and False Rejection Rate (FRR) and to improve the performance of the system. In this paper a brief study on the advancement in the techniques used by various authors in the fingerprint recognition system along with their performance improvement is discussed below. Gaps are identified based on the observations and an optimum approach is proposed.[6]

#### 7. Unlicensed Driving

A Scoping Study to Identify Potential Areas for Further Research Foundation for Road Safety Research.

1. Unlicensed driving is widespread. There were almost 380,000 proceedings in 1996 and estimates from a variety of sources suggest that perhaps only 1 in 6 unlicensed drivers are prosecuted each year.
2. With skilled interviewers it is relatively easy to find and talk to people who are driving unlicensed or have done so in the past. There appears little social stigma from this offence.
3. Of unlicensed drivers brought to court, around 13 per cent have been disqualified. The great majority are provisional licence holders driving without a full licence, not displaying L plates or being accompanied by a qualified person.
4. Unlicensed driving is closely linked to uninsured driving. There were more than 500,000 proceedings for uninsured driving in 1996.[7]

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## 8. A Prototype of a Fingerprint Based Ignition Systems in Vehicles

Biometric systems have overtime served as robust security mechanisms in various domains. Fingerprints are the oldest and most widely used form of biometric identification. A critical step in exploring its advantages is to adopt it for use as a form of security in already existing systems, such as vehicles. This research work focuses on the use of fingerprints for vehicle ignition, as opposed to the conventional method of using keys. The prototype system could be divided into the following modules: fingerprint analysis software module that accepts finger-prints images; hardware interface module and the ignition system module. The fingerprint recognition software enables fingerprints of valid users of the vehicle to be enrolled in a database. Before any user can ignite the vehicle, his/her fingerprint image is matched against the fingerprints in the database while users with no match in the database are prevented from igniting the vehicle. Control for the ignition system of the vehicle is achieved by sending appropriate signals to the parallel port of the computer and subsequently to the interface control circuit. The developed prototype serves as an impetus to drive future research, geared towards developing a more robust and embedded real-time fingerprint based ignition systems in vehicles.[9]

## 9. Microchip Technology

Microchip Technology is an American manufacturer of microcontroller, memory and antilog semiconductors. Its products include microcontrollers (PICmi-cro, dsPIC / PIC24, PIC32, AVR, AVR32 and SAM), Serial EEPROM devices, Serial SRAM devices, KEELOQ devices, radio frequency (RF) devices, thermal, power and battery management analog devices, as well as linear, interface and mixed signal devices. Some of the interface devices include USB, ZigBee/MiWi, Controller Area Network, LoRa, SIGFOX and Ethernet. Corporate headquarters is located at Chandler, Arizona with wafer fabs in Tempe, Arizona, Gresham, Oregon and Colorado Springs, Colorado, assembly/test facilities in Chachoengsao, Thailand. Sales for the fiscal year ending on March 31, 2016 were 2,173,334,000. Among its chief competitors are Analog Devices, Infineon, Maxim Integrated Products, NXP Semiconductors (previously Philips and purchased Freescale), Renesas Electronics, STMicroelectronics, and Texas Instruments. Former rival Atmel was bought in 2016 [5]

## III.METHODOLOGY

The framework comprises of shrewd card per user, controller module, safety belt detecting module, start framework module and the shrewd card which is inserted into the framework by the client. A fingerprint coordinate causes the information pins to be in a high rationale level and in a perfect world yield around 5volts while a fingerprint confound makes the information pins to be in a low rationale level and in a perfect world yield 0 volts. An interface control circuit was developed to connect the PC parallel port to the start arrangement of a vehicle. This circuit gives a high level of electrical detachment between the PC and the start framework which work at different voltage levels, using parts called opt couplers. The circuit additionally gives abilities to the controlling the start system through the interconnection of electronic parts, for example, transfers, bipolar intersection transistors, resistors and diodes. Three wires from the start arrangement of a vehicle are required to be associated with the interface circuit. At the point when the parallel port information pins which frame part of the association with the interface circuit are in a HIGH rationale level, the interface circuit is triggered to touch off the vehicle. One the other hand, the vehicle is not lighted at the point when the circuit is in a LOW rationale level. The primary segments of the model frame work are the fingerprint acknowledgment programming and the interface control circuits which are to shape a consistent association with a vehicle start framework. The association between the different pieces is graphically spoken to.

## IV.CONCLUSION

In this paper work, we have presented a survey on how to develop fingerprint based authentication system for driving system. Additionally we tried to give a brief idea about the how convolution neural network uses for fingerprint livens

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detection in real time application. From survey we found that it is a need to develop the authenticated system for driving so that unlicensed person can't access the vehicle so that accidents can be reduced.

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