OVERVIEW OF DRIVING LICENSE AUTHENTICATION SYSTEM

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Abstract – *Nowadays, people prefer things in the form of digitalization. Things are getting difficult which are not digitalized. The purpose of this study is to simplify the driving license authentication system by making it a digitalized version. The difficulty in driving license authentication system is a driver has to be authorized manually whether he/she is authenticated to drive based on the license. Driver has to carry the license always to be verified. To handle this difficulty a system to be created to verify the license. The idea is to use mechanisms like face recognition, fingerprint matching algorithm for this purpose. A centralized storage which stores the fingerprint and facial image of authenticated drivers along with expiration period. These data to be stored securely. Hence, these data to be retrieved via web or mobile application.*

Key Words: **Driving License Authentication System, License verification, Authentication system, Driving license, Digitalization. Face recognition, Biometric detection for license authentication system.**

1. INTRODUCTION

The advancement in the field of transportation leads to the increase in number of users who use road facility. So, the threat of the road accident is fast increasing and it is confirmed that the road accidents is the unlicensed drivers driving on the road. This may also include suspended, revoked, expired, cancelled and denied licenses. The verification of drivers on road individually is a hard-hitting process. Considering all these scenarios, there is an urge in the need of a system which prohibits an unlicensed driver using vehicles on the road.

1.1 APPROCH OF AUTHENTICATION SYSTEM

There are multiple ways, that we can use to authenticate the drivers instead of manual verification process. Few mechanisms that we can use to authenticate drivers, face recognition and finger print authentication. Face recognition to be implemented in some important places like traffic signal and on bypass road tollbooth. The system will automatically recognize the user and that will check the database whether the user is authenticated or not. Based on that a report of history will be generated regarding travel history. All these logs to be stored in a centralized storage. These logs are also used for multiple purpose by authenticated person if required. Fingerprint authentication mechanism requires fingerprint sensors that capture the user fingerprint and check the available resource in web

server. If a match is found the driver is authenticated. These authentication histories also to be stored for future purpose in a secure centralized server.

1.2 Algorithm Specification

A machine learning and deep learning algorithm to be used to recognize the face for face recognition and for fingerprint match fingerprint to be captured in the form of image with different dimensions. The captured image to be verified against database image to authenticate for the fingerprint verification.

2. OBJECTIVE

The objectives of the present study are as follow as below.

- ➢ Model Design
- ➢ Unlock car using driving license authentication
- ➢ Algorithm overview

2.1 MODEL DESIGN

Arduino hardware device to be used to capture the fingerprint of users and to store these fingerprints in the form of image in a centralized secured server. The related data regarding to this are photo, fingerprint, expiration period, history of travel logs, history of authentication logs. When we need to authenticate the license of drivers capture the fingerprint in the form of image and this image to be verified against the available data stored in the database server. Some advanced things can also be developed with this data in future.

Fingerprint mechanism requires the open-source Arduino software makes it easy to write and upload code on the board. It runs on Windows, Mac OS and Linux. Arduino boards are able to read inputs – light on a sensor, a finger on a button, or a message and that turns it into an output. For Arduino, Arduino programming to be used.

Face recognition mechanism requires python OpenCV program that will read image and to be used with an algorithm for image match to verify license. Initially, multiple dimensions of user image to be taken with a good light and to be stored in a database server along with this user data.

2.2 UNLOCK CAR USING DRIVING LICENSE AUTHENTICATION

An advanced technology can be built on top of this. A car unlock mechanism that can be introduced with driving

license authentication system. Cars to be included with sensors that read fingerprint. This car only will be unlocked if and only if the driver is authenticated by license. Also, this tool can be used in multiple ways. If one owns a car the owner can give permission to use by authorizing and also the authorizing member needs to have a valid license, this check will be done automatically behind the servers. The car can only be authorized to use by owner others will be considered as a guest user. Any number of guest user can be included to unlock the car anytime. The guest not to able to be authorize. The authorization of a vehicle can be done by an application it takes owner's credential and owner has to authorize the user based on a unique information like SSN number, Aadhaar number in India.
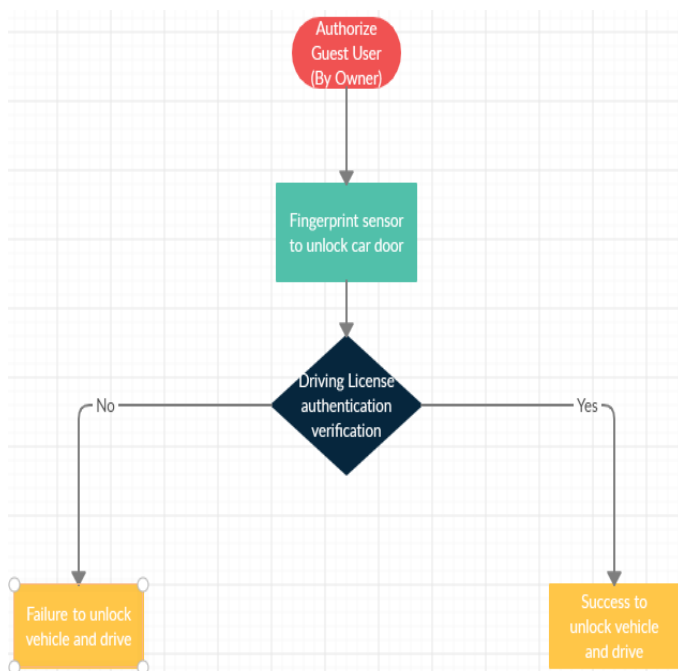

Fig -1: Flow chart diagram

When the guest user is failed to be authorized it's good to notify the car owner that the authorized person failed in driving license verification process. In this way, it is highly ensured that the only the person with valid driving license can able to unlock the car and to drive.

In this way a huge number of road accidents due to unauthorized driving license can be reduced. This system can also to be built with face recognition sensor. But it is highly preferred with finger print authentication sensor to be used.

2.3 ALGORITHM OVERVIEW

Face recognition algorithm includes cropped face detected image which is usually in grayscale. There are huge number of algorithms for face recognition, a few commonly used algorithms are using LBP, SVM, KNN Algorithm and PSO technique which uses accuracy in terms of percentage of recognized face. If accuracy factor is greater than some

percentage then that's a match. This face recognition algorithm works by identifying the facial features by extracting the features based on the algorithm. This analyze the shape and size of the features such as eyes, nose, ears and its relative position with other features of face. In order to build a facial recognition feature is to

➢ Detect the face and to crop the detected image for optimized processing.

➢ Recognize the face and calculate the accuracy in terms of percentage.

This face recognition can also be done with the video. Video which includes an image frame. Running multiple image frame within a second forms a video. This image frame to be captured for matching the pattern.

Fingerprinting is one of the widely used biometric technique. The pattern of ridges, loops and whorls of fingerprint is unique. An algorithm is required to scan these ridges, loops and whorls.and the commonly used algorithm is scan algorithm (LSA). It was developed to compare the partial fingerprints and which is an optimized algorithm that reduces the time to compare the match in fingerprint. The pre-processing of a fingerprint is used to improve its quality and improved feature extraction.

A score match can be used in terms of accuracy for fingerprint to match the features. A multiple representation is available to extract minutiae from fingerprint image using multiple representation algorithms. The matching state which computes the Euclidian distance between the finger code template and feature vector.

Spaced frequency transformation algorithm computes the Fourier transformation, line scan algorithm which are used to compare the partial fingerprint features and patterns. Pattern matching algorithms look the common features and similarity difference in between the features. This also used to detect the duplicate patterns. These biometric features to be applied for driving license authentication.

3. CONCLUSION

In this digitalized world, there requires an automated system for driving license authentication to encounter road accidents and lot of issues. This kind of license authentication system that uses unique identification features such as facial recognition, fingerprint authentication will be very much useful. These data to be stored in a centralized server since, the data are personal information of people which needs to stored secured. This authentication system for license improves lot of time and can be applied with several use cases.

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