E-Verification of Driver for Humans and Automobile Safety

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Abstract: **-** 'Security is gainful mishap is painful'. According to the Ministry of Road Transport and Highways, 1,50,785 people were killed and another 4,94,624 were injured in 4,80,652 road crashes in India in 2016. This translates into 1317 crashes and 413 deaths every day or 55 crashes and 17 deaths every hour(Zoya Mateen, 2018). There were mainly four reasons, **1) Driver not having a license. 2) Intake of alcohol. 3) Over-taking. & 4) Speeding**. Through our research, we have developed a technique which includes, A Fingerprint Accessed Driving License (FADL) based ignition system in cars incorporates security as well as provides safety measures against theft, underage driving, etc. If the fingerprint matches the fingerprint stored in the Database of Regional transport office (RTO) then it goes for alcohol detection. After passing all authentications, the vehicle will be ignited. The vehicle will not be ignited if any one of the authentications fails and will not proceed the next step. This increases the security of vehicles and also ensures safe driving by preventing accidents.

Keywords:- *Smart Vehicle, Fingerprint Sensor, Driving License, Driver Safety, Alcohol Sensor, Biometrics*

I. Introduction-:

Driving without driving license is a major issue in many countries. Survey says that the accidents happened mostly by the unlicensed drivers, drunken drivers and less usage of seatbelts. Owing to unsafe conditions on roads, the rate of accidents in India has been high. The mortality rate in India is 8.7 per hundred thousand populations as compared to 5.6 in the UK, 5.4 in Sweden, 5.0 in. In terms of mortality per 10,000 vehicles, the rate in India is as high as 14 as compared to less than two in developed countries. The estimated number of deaths in India for the years 2005, 2006 and 2014 are 1,10,300, 1,05,725 and 1,54,600. In the existing method, keys were used to start the vehicle(Road Safety Commission, 2002). By this method, vehicles can be stolen easily and unable to prevent accidents. The proposed system consists of a database (of fingerprint) capable of storing the fingerprint of a particular person. First, the person will put the finger on the screen which will consist of Inbuilt Fingerprint Sensor. If the fingerprint matches with the fingerprint stored in the database then it goes for alcohol detection. A person is checked by an alcohol detector whether that person is drunk or not. After passing all authentications, the vehicle will be ignited. The vehicle will not be ignited if any one of the authentications fails and will not proceed the next step. The vehicle will not be ignited if the driving license validity is expired, If the driving license card is learner license or If the driving license card is blocked. If the person is drunk then the ignition will turn off and gives a buzzer alert.

II. Literature Survey:-

Fingerprint Recognition based system:

Prior proposed techniques are innovated to build smart driving license or integrating a smart chip in the driving license. The similar work is proposed for the vehicle ignition that if the driver has a valid license then only the person will be able to access the vehicle and start the ignition. But in this proposed work they driving license used are the smart card and the card readers need to be installed in the car (B.Dimple,2015). The prior work also has an alcohol sensor similar to proposed work and displays the result on an LCD screen. The biometrics of the person are stored in the smart card itself and also stores the basic details of the driver linked to the respective biometrics. So the person when sits in the car he needs to swipe the card and authenticate the smart card via the preinstalled card reader in the car and then the person needs to use alcohol sensor then only the car ignition is triggered on.(Omidiora,2011)(Morita, 2005)(Ravi Kumar, 2018)

Iris Recognition based system:

In this prior work, the author has stated multimodal biometric systems for access to use the cars. One of the methods is to use iris recognition system. In this method, the user's eyes are scanned via an iris scanner installed in the car and authenticates it with the driving license database. The authors have stated a few advantages for the same that the method is one of the most secure method and fast compared to other traditional biometrics recognition systems (Lupu C, 2007). But there are also a few disadvantages which includes small target distance needed, difficult to scan a person while he is doing some movement.

Voice Recognition based system:

Voice recognition works by digitizing a voice sample of a person while speaking some text or numbers. Similar to the fingerprints and other biometric recognition systems, voice recognition also stores voice prints in the database to match and authenticate the driver. The major disadvantage of using the voice recognition method is that a person's voice can be tampered, for example, someone can dub someone's voice which can lead him to access that vehicle/car respectively (Lupu C, 2007).

III. PROPOSED METHOD:-

The Block Diagram of the proposed methodology is as shown in figure 1. It explains the overall working process of the system. Through the help of the biometric sensor, the fingerprint will be sensed. The system searches a License number for the thumb impression, and verify with the RTO database and collects various information related to the driving license. After fetching information from RTO database, the data will be stored in the local database. Local database will store the information of the driver so when that driver login again he/she will not require to connect with RTO's database. If verification is unsuccessful then the Ignition will not be possible. Here the first portion of the security is achieved.

If the driver license is verified with the database, then the alcohol sensor (MQ-3) will be activated. The alcohol sensor will have a Threshold value, which will be set according to govt. rules. Alcohol sensor will sense, if the sensed value is greater than the threshold value(x), the delay will be generated until the sensed value reaches equal to or less than the threshold value. If the Sensed value is less than or equal to the threshold value, the controller will energize the relay for the ignition of the car.

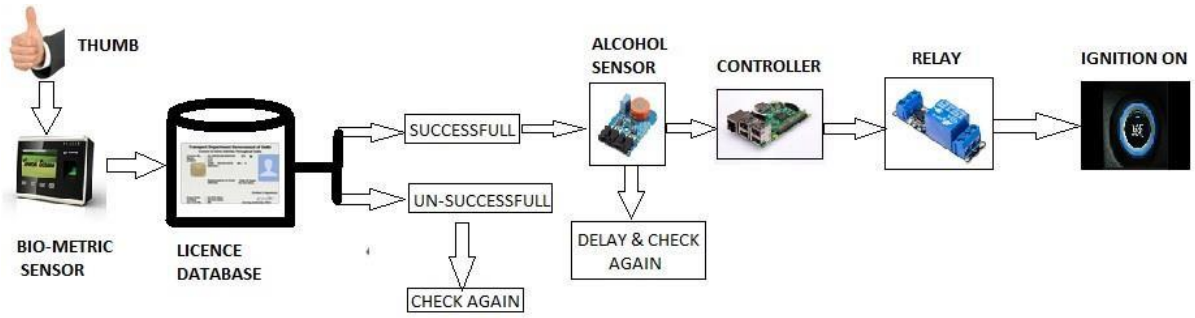

Fig. 1(Block-Diagram of proposed technique)

Algorithm:

Step 1: Start.
Step 2: Login page will be displayed.
Step 3: Read the thumb impression of the driving person.
Step 4: Match the thumb impression with template present in the RTO Data Base. Step 5: If the match is unsuccessful. Goto step 2.
Step 6: If the match is successful than store data in a local database. Step 7: Alcohol Senor will sense the Driver's intake of Alcohol.
Step 8: If the sensed value will be greater than the threshold value. Step 9: Generate Delay. Goto step 7.
Step 10: If the sensed value will be less than the threshold value. The controller will energize relay and ignition Button will be ON. Goto step11.
Step 11: Stop.

Flow chart

The execution of the proposed technique will Start from the Login page. After entering the details (one- time registration) it will ask for reading the thumb impression of the driving person. If the authentication is done it will go for the verifying with RTO's database. If the data is verified with RTO's database it will store data in the local database. If the match is unsuccessful. Try again.

Alcohol Sensor will sense the Driver's intake of Alcohol If the sensed value will be greater than the threshold value. It will generate Delay, till the sensor values equal or less than the threshold value.

If the sensed value will be less than the threshold value, it will give input command to the controller. The controller will give an output command to the relay. Hence relay will be energized from NO(normally open) to NC(normally closed) and ignition Button will be ON.

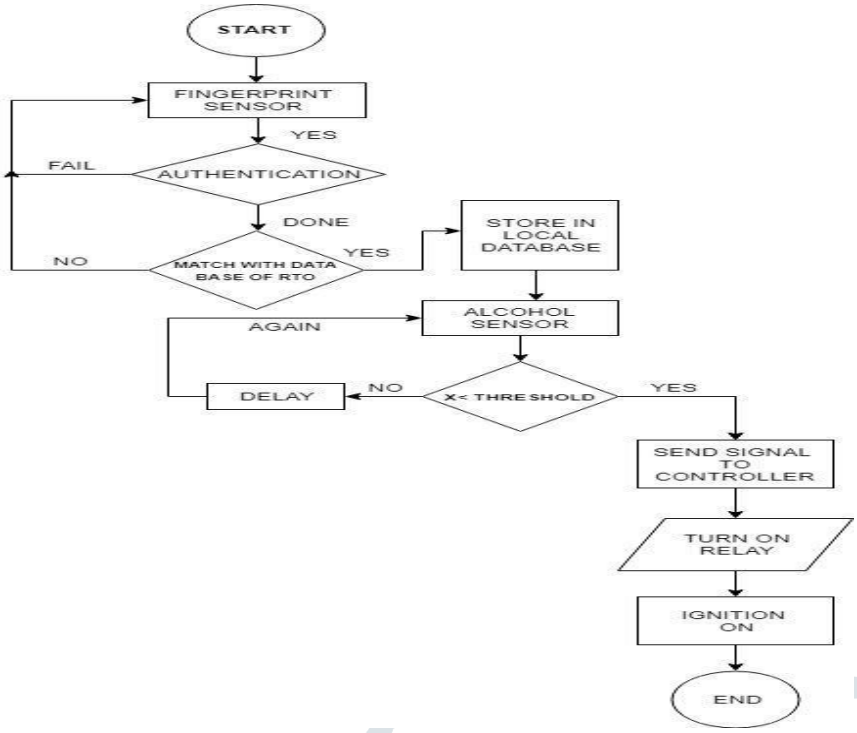

Fig.2 (Flow chart of the proposed technique.)

Implementation:

Fig.3 (Enter your driving license no.)

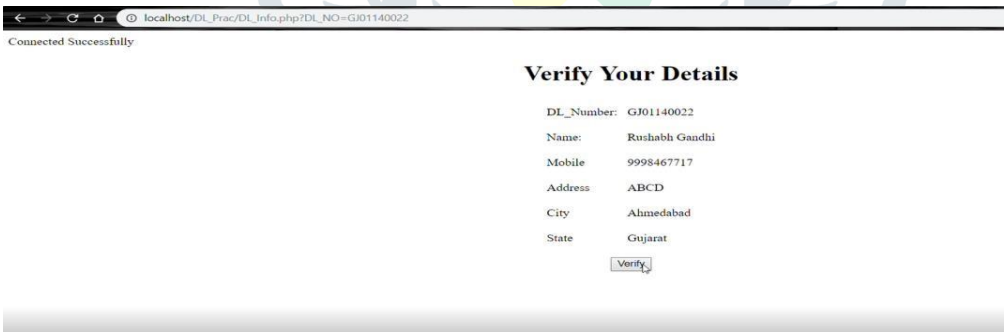

Fig.4 (Verify your details)

Fig.5 (Enter your OTP.)

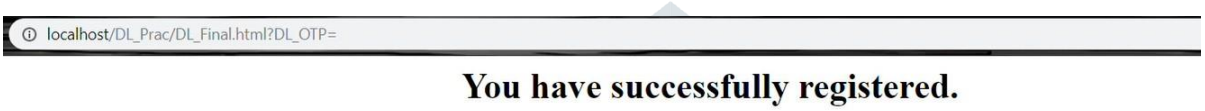

Fig.6(Verified and Registered)

Fig.7 (Portal)

IV. CONCLUSION

It can be concluded that "E-verification of Driver for Human and Automobile Safety" effectively verifies the driving license. The system introduces a facility for the owner's car safety. It also helps the RTO officials and owner of the car to maintain records systematically and reduces a lot of manual efforts. It can avoid drink and drive accidents. A person without a Driving License can not drive the car and for that, we have just updated the system and linked with the smartcard instead of spending a whole lot of money for making a smart card and installing card readers. Drivers are not required to rely on driving license.

V. FUTURE WORK

The application can be enhanced with the different concepts by including safety like, accident detection, over speeding, overtaking, face Recognition and Number Plate Recognition through image/camera, send a message to the drivers about the expiry dates of documents, verifying the vehicle-related information such as RC book, emission test, insurance and etc. It is a practical project, it can be dispatched in Real-time Environment.

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