



A REVIEW OF SMART DRIVING DOCUMENT AUTHENTICATION TECHNIQUES

¹ DHANASHRI SUNIL DHALE, ² DR. V B GADICHA

¹ P.G Student, Department of Computer Science & Engineering, G H Rasoni University, Amravati,

² Associate Professor, Department of Computer Science & Engineering, G H Rasoni University, Amravati,

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, QR code scanning, optical character recognition algorithm, behavioral biometrics modalities, etc. for this purpose. A centralized storage which stores the fingerprint and facial image of authenticated drivers along with expiration period is required. These data to be stored securely. Hence, these data to be retrieved via web or mobile application.

In this paper, we have analyzed different approaches to implement smart driving license checking systems. We have discussed these approaches with respect to reliability and road safety. This paper mainly focuses on the various proposed methodologies which are used to tackle the important issue of smart driving license checking. In this paper, we have presented the exhaustive analysis of the vast literature relevant and pertinent to authentication and the mechanisms associated with it. Although, there are lot many research contributions in this field, but here we have critically analyzed and summarized ten significant research works and projects addressing it. These related works are recent, consistent and pertinent. The studied literature is also systematically arranged in tabular form for comparative analysis. Although different approaches used different platforms or technology, most of the techniques revolve around the use of face recognition, fingerprint matching algorithm, QR code scanning, optical character recognition algorithm, etc. for this purpose of authentication.

Index Terms – Web based and android applications, Smart Driving Document Authentication, RTO, Face Recognition, Fingerprint Matching Algorithm, QR Code Scanning, Optical Character Recognition (OCR)

I. 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.

People are using the vehicle since long time but there is no any advance options that came into vehicles so that it is necessary to develop the system which will help users to keep safety of vehicle and will help the RTO department to keep the track of expired license as well. At present there's no system available which will help the RTO department to block the access of vehicle. In existing there is one system which will work on RFID interaction so we are replacing this system by QR code scanning, in which the system will scan the QR code for cross checking the category of license, license expiry date and other parameter. When every condition is met then the system will allow to start the vehicle otherwise the user is unable to have access to the vehicle.

The main aim of this paper is to study various methods that allow or deny permission to have access to vehicle, on the basis of driving license and vehicle ownership. A driver should possess a valid driving license to drive a vehicle. This prevents an individual from driving a vehicle if he/she is not authorized licensed holder and helps in reducing road accidents.

Now a days every now and then accident happens, among them 70% cases are of fraud license or the vehicle who doesn't have proper documents so it can be clearly said that peoples are violating RTO rules. Further auto accidents are leading cause of death for teens. When teen drivers ride with other passengers, the risk of being in an auto crash doubles. Overall, teenagers underestimate or are unable to recognize hazardous conditions. No matter what is the cause, accidents are scary and cause life changing injuries. So as

a solution to the today's scenario, it is necessary to develop the system which automatically checks for the feasible solutions available for driving. We see many bikes, cars and some other vehicles running without proper documents. For RTO department it is not possible to look after the huge number of vehicles so that we have proposed a QR code based System to automatize this system.

II. LITERATURE REVIEW

Although there are many research works on student engagement prediction system, here we have critically analyzed and summarized ten research works and projects addressing this issue. It is observed that most of the recent works use face recognition, fingerprint matching algorithm, QR code scanning, optical character recognition algorithm, behavioral biometrics modalities, etc. for this purpose. Most of the works have the same working principle as we have already discussed above.

In 2017, Ganesh Sharma, et. al., provide a system that eradicates the need of carrying several original documents. Driver can carry the QR code in his device [1]. Using QR code the rider along with his documents gets authenticated. By using this application it is not necessary to carry all the documents and license every time. Simply you have to carry QR code in your Smartphone. By using this system the driver goes through the verification process through a reliable and efficient manner. QR code is being widely used for implanting messages such that people can easily use their Smartphone's to capture the QR code and gain relevant data from QR code reader. User can get QR code by simply registering with this system.

In 2020, Bhavani Ratakonda, Ajay Therala, and Chanikya Kumar Hanumanthu have proposed a system in which it simplifies the work of traffic police in detecting the fake driving license users [2]. RTO Employee can login into this system and generate a new driving license with QR code for every applicant who has undergone test drive and who has successfully secured their learning license. In this system every employee can login with their credentials, they can generate a QR code and they can enter the details of applicant and generate new license with QR code attached to it. Traffic police can scan this QR code through Scanner app from mobile phone to retrieve the data present in QR code, if data retrieved in scanner app and data on the license mismatches then police can conclude that user is a fake user. QR code on the driving license contains name, father's name, date of birth, house no., address and date up to when the card is valid.

In 2018, Komal Chorghade, Piyush Dahiwele, Saurabh Deshmukh, Prof. Prajakta Pise proposed a system where the driver will register to RTO services and the login credentials will be provided to driver to login [3]. The driver will generate a QR code for his RTO driving license therefore it is not necessary to him to carry hard copy driving license with him also the rulebook will be provided to driver regarding fine details. At RTO traffic police end the police will scan the QR code in the application and the data from server will be fetched and license details will be shown. Also, traffic police can enter the vehicle registration number to get details of PUC, Insurance and vehicle papers for verification. The traffic police will be able to find the lost vehicles also as the lost vehicles data will be given in the application. The traffic police will be able to generate the challan through the application and it will be linked to the vehicle and the driver has to pay the challan online. This application provides services to driver (user) and traffic police.

In 2018, Kaveri Ningappa Gunjiganvi, et.al., design an app which takes the vehicle number manually, then the details retrieved from the number plate in text format is used to extract all the important information of the vehicle like, the name of the owner, address of the owner, date of registration of the vehicle etc. from the database [4]. The police can verify whether the documents are fake or not. This application will make sure you have all the documents like PUC, RC Book, Insurance papers can be easily handled. This app can help you not to carry all the documents with you every time you drive a vehicle, which is used by the police only. If he breaks any rules of driving the fine can be added. Applied fine details and insurance dues will be sent as message to the owner. If any other person except the owner drives the vehicle, then a message alert will be sent to the owner of the vehicle. For us, it is useful as we do not have to carry our documents to every place with the fear of losing them. The user app can be used by owner of the vehicle which extract the information of his vehicle and user can pay the fine through it.

In 2017, Prof. Chandrakant Umarani, et.al., create an application for RTO services. This application provides registration for the license, vehicles registrations and other documentation [5]. In this application investigation functions like checking of license, documents etc. for help of RTO officers are provided. By using this android application traffic police can verify the whole details of person and vehicle. RTO management will be having lot of work regarding registration of vehicles and issue of driver's license insurance. Similarly vehicle owner sometimes forgets to carry the license at time of enquiry. To solve such problems that is by storing all the information related to vehicle and driver at database by RTO administrator.

In 2020, Prof. C. S. Pagar, et.al., proposed an advanced RTO scheme [6] which is employed for vehicle verification mechanism for fixing the real-time trouble which takes secure custody of the required files like driving license, PUC, insurance, RC book etc. which verify the vehicle user electronically, so outcome during a heap extra transparency, authenticity, and additionally minimize corruption of pretend archives and additionally reduces the administration overhead of RTO Admin with the help of minimizing the employment of papers.

In 2018, Dr.A.Srinivasarao, S.Gopiraju, M.Raghavendra have developed a web based application [7] that can handle the verification process of a licence with the help of the user's aadhar number which is the primary key for accessing the user's details. By performing the digitalized verification process there is no chance of misleading of the licensed persons. The proposed system is highly reliable on the internet and more secure in terms of authentication by performing verification with the particular registered authority people only, who will be assigned by the department.

In 2021, Prof.Sindhu A S, Arpitha S, Bindushree C, Dhruvashree, Aishwariyaa V, proposed a framework that essentially defeat from counterfeit documents [8]. It comprises of web and windows application where centralized data set of approved vehicles is put away and furthermore it will have RFID vehicle labels, RFID label per user. This tag will set in a vehicle. The label per user is utilized to retrieve the information from the RFID labels. By perusing the chronic number in the RFID tag. Vehicle can be effectively done. Driving permit framework is a gigantic errand for the public authority to screen. Numerous crimes can happen from the traffic control staff while they are verifying the archives. The wrongdoing can be occurred by an individual also. To conquer that issue by executing one more compact finger impression scanner that is issued to the checkpost staff, which is incorporated with centralized data set where the individual permit data is put away. On the off chance that the individual places his finger on the unique mark scanner, the gadget will disclose to you if they had a permit. This should be possible by interlinking the vehicle subtleties with the centralized information base.

In 2018, Sandeep Gupta, Attaullah Buriro, Bruno Crispo, present DriverAuth—a fully transparent and easy-to-use authentication scheme for drivers that is based on common behavioral biometric modalities, such as hand movements, swipes, and touch-strokes while the drivers interact with the dedicated smartphone-based application for accepting the booking. A preliminary study of behavioral biometric-based approaches offers a usable verification mechanism on smartphones that could be a potential solution to improve the safety of riders in the emerging on-demand ride and the rideshare infrastructure.

In 2021, Abraham Ziegen, Joel Manova M and Dr. A Akilandeswari, proposed a project that prevails in the way for replacing the usage of hard copies with digital ootprint. To overcome this problem face detection and finger print based license authentication system using IOT will be implemented. Raspberry pi is the brain of this system, which helps for face detection and face recognition. The USB camera gets interfaced with raspberry pi to get the data from user. All these data are uploaded to the cloud (IOT) through NodeMCU . It is used to find the person having license or not and also get the validation of the license. Whenever the person doesn't have a legitimate license or if the license is already expired, the display indicates it is invalid and vice versa.

Table 3.1 shows the comparative analysis of the existing methods. The emphasis is on the title of the paper, the methodology and problem focus, the platform used for development and experimentations, and the type of authentication technique used.

Table 3.1: Comparative Analysis of the existing methods

Ref. No.	Name of Authors, Paper Title, Year	Methodology and Problem Focus	Platform Used	Authentication Using
[1]	Ganesh Sharma, et.al., E-Driving License and RC Book Verification System Using QR Code, 2017	Using QR code the rider along with his documents gets authenticated. By using this application, it is not necessary to carry all the documents and license every time. Simply you have to carry QR code in your Smartphone.	Android Application	QR Codes
[2]	Bhavani Ratakonda, Ajay Therala, and Chanikya Kumar Hanumanthu, Driving license detection using QR code, 2020	In this system every employee can login with their credentials, they can generate a QR code and they can enter the details of applicant and generate new license with QR code attached to it. Traffic police can scan this QR code through Scanner app from mobile phone to retrieve the data present in QR code, if data retrieved in scanner app and data on the license mismatches then police can conclude that user is a fake user.	Android Application	QR Codes
[3]	Komal Chorghade, Piyush Dahiwele, Saurabh Deshmukh, Prof. Prajakta Pise, RTO Automation Using QR Code, 2018	the driver will register to RTO services and the login credentials will be provided to driver to login. The driver will generate a QR code for his RTO driving license. At RTO traffic police end the police will scan the QR code in the application and the data from server will be fetched and license details will be shown	Android Application	QR Codes
[4]	Kaveri Ningappa Gunjiganvi, et.al., Vehicle Document Verification using Vehicle Number (VCOP-App), 2018	An app which takes the vehicle number manually, then the details retrieved from the number plate in text format is used to extract all the important information. The police can verify whether the documents are fake or not. This application will make sure you have all the documents like PUC, RC Book, Insurance papers can be easily handled. Applied fine details and insurance dues will be sent as message to the owner. If any other person except the owner drives the vehicle, then a message alert will be sent to the owner of the vehicle.	Mobile Application based on Linux Kernel and Java Development Environment	Optical character recognition algorithm
[5]	Prof. Chandrakant Umarani, et.al., Smart RTO Web and Android Application, 2017	This application provides registration for the license, vehicles registrations and other documentation. In this application investigation functions like checking of license, documents etc. for help of RTO officers are provided. By using this android application traffic police can verify the whole details of person and vehicle. All the information related to vehicle and driver is stored at database by RTO administrator.	Web based android application	License number
[6]	Prof. C. S. Pagar, et.al., Electronic Secure Vehicle Verification System using Advanced RTO System, 2020	An advanced RTO scheme which is employed for vehicle verification mechanism for fixing the real-time trouble which takes secure custody of the required files like driving license, PUC, insurance, RC book etc. which verify the vehicle user electronically, so outcome during a heap extra transparency, authenticity, and additionally minimize corruption of pretend archives and additionally reduces the administration overhead of RTO Admin with the help of minimizing the employment of papers.	Web application	Optical character recognition algorithm, hissing QR Codes
[7]	Dr. A. Srinivasarao, S. Gopiraju, M. Raghavendra, 2018	Th authors have developed a web based application that can handle the verification process of a licence with the help of the user's aadhar number which is the primary key for accessing the user's details. By performing the digitalized verification process there is no chance of misleading of the licensed persons. The proposed system is highly reliable on the internet and more secure in terms	Web based application	Aadhar number

		of authentication by performing verification with the particular registered authority people only, who will be assigned by the department.		
[8]	Prof.Sindhu A S, Arpitha S, Bindushree C, Dhruvashree, Aishwariyaa V , Vehicle And Licence Authentication Using RFID and Finger Print, 2021	It comprises of web and windows application where centralized data set of approved vehicles is put away and furthermore it will have RFID vehicle labels, RFID label per user. This tag will set in a vehicle. The label per user is utilized to retrieve the information from the RFID labels. By perusing the chronic number in the RFID tag. Vehicle can be effectively done. The wrongdoing can be occurred by an individual also. To conquer that issue by executing one more compact finger impression scanner that is issued to the checkpost staff	Web and windows application	RFID tags, Finger Impression Scanner
[9]	Sandeep Gupta, Attaullah Buriro, Bruno Crispo, DriverAuth: Behavioral biometric-based driver authentication mechanism for on-demand ride and ridesharing infrastructure, 2019	The authors present DriverAuth—a fully transparent and easy-to-use authentication scheme for drivers that is based on common behavioral biometric modalities, such as hand movements, swipes, and touch-strokes while the drivers interact with the dedicated smartphone-based application for accepting the booking. A preliminary study of behavioral biometric-based approaches offers a usable verification mechanism on smartphones that could be a potential solution to improve the safety of riders in the emerging on-demand ride and the rideshare infrastructure.	Web and windows application	Behavioral Biometrics Modalities
[10]	Abraham Ziegen, Joel Manova M and Dr. A Akilandeswari, License Verification System With Face Recognition Using IOT, 2021	This project prevails in the way for replacing the usage of hard copies with digital footprint. To overcome this problem face detection and finger print based license authentication system using IOT will be implemented. Raspberry pi is the brain of this system, which helps for face detection and face recognition. The USB camera gets interfaced with raspberry pi to get the data from user. All these data are uploaded to the cloud (IOT) through NodeMCU . It is used to find the person having license or not and also get the validation of the license. Whenever the person doesn't have a legitimate license or if the license is already expired, the display indicates it is invalid and vice versa.	Raspberry pi, Node MCU, IoT	Face Recognition

III. PROBLEM FORMULATION AND POSSIBLE APPROACH

After studying the vast literature, we have identified the problem and a possible approach can be mentioned as follows:

We can design a system based on smart driving license checking system which would enhance road safety and vehicle security. The system helps to limit the vehicle operation on the basis of three parameters; driving license expiry date, vehicle ownership and category of the vehicle for which driving license is issued. The hardware and software systems required for the improvement of safety and securities can be implemented. A QR code will be encrypted with a secret code and the details of a vehicle will be associated with it. An individual will be allowed to drive the vehicle by scanning the QR code. If not authorized, when a person attempts to start the vehicle, the short message service [SMS] system sends the driving license details to a preregistered mobile number and the vehicle's ignition system will be disabled.

IV. DISCUSSION

Through the studied literature, it is found that the cutting-edge technologies can make huge advancements in driver document authentication and can provide adequate security, reliability and ease of use. Therefore, it is expected in the near future that the driver document authentication can be modified which can facilitate the public and RTO alike, thus providing a framework for fair driving. The development of an overall effective smart driving document authentication is anticipated in near future.

REFERENCES

- [1] Ganesh Sharma, et.al., E-Driving License and RC Book Verification System Using QR Code, International Journal of Advances in Electronics and Computer Science, Volume-4, Issue-1, pp. 1-2, Jan-2017
- [2] Bhavani Ratakonda, Ajay Therala, and Chanikya Kumar Hanumanthu, Driving license detection using QR code, E3S Web of Conferences, ICMED 2020
- [3] Komal Chorghade, Piyush Dahiwele, Saurabh Deshmukh, Prof. Prajakta Pise, RTO Automation Using QR Code, International Research Journal of Engineering and Technology (IRJET), Volume 5, Issue 4, pp. 1157-1160, Apr-2018
- [4] Kaveri Ningappa Gunjiganvi, et.al., Vehicle Document Verification using Vehicle Number (VCOP-App), International Journal of Engineering Research and Technology (IJERT), ICRTT 2018 Conference Proceedings, Volume 6, Issue 15, pp. 1-5, 2018
- [5] Prof. Chandrakant Umarani, et.al., Smart RTO Web and Android Application, International Journal of Engineering Science and Computing (IJESC), pp. 12576-12578, June 2017
- [6] Prof. C. S. Pagar, et.al., Electronic Secure Vehicle Verification System using Advanced RTO System, International Research Journal of Engineering and Technology (IRJET), Volume 7, Issue 4, pp. 5330-5336, Apr 2020
- [7] Dr.A.Srinivasarao, S.Gopiraju, M.Raghavendra, E- Driving License Authentication System, International Journal for Research in Engineering Application & Management (IJREAM), pp. 176-178, 2018
- [8] Prof.Sindhu A S, Arpitha S, Bindushree C, Dhruvashree, Aishwariyaa V , Vehicle And Licence Authentication Using RFID and Finger Print, International Journal of Advanced Research in Computer and Communication Engineering (IJARCC), Volume 10, Issue 7, pp. 346-350, July 2021
- [9] Sandeep Gupta, Attaullah Buriro, Bruno Crispo, DriverAuth: Behavioral biometric-based driver authentication mechanism for on-demand ride and ridesharing infrastructure, The Korean Institute of Communications and Information Sciences (KICS) published by Elsevier, Science Direct, ICT Express, Volume 5, pp. 16-20, 2019
- [10] Abraham Ziegen, Joel Manova M and Dr. A Akilandeswari, License Verification System with Face Recognition Using IOT, International Journal of Advanced Research in Science, Communication and Technology (IJARSCT), Volume 4, Issue 2, pp. 656-670, April 2021