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e-LICENCE GENERATION FOR DRIVING TEST

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Abstract—In existence, the driving licence test is monitored and evaluated manually by the RTO authorities. An applicant applying for a license has to drive over the prescribed lane. If he/she fails to do so, he/she will be disqualified. This project is developed with a customized track providing all driving challenges and also helps applicants to get an e-driving licence without any biasing interference of authorities. In this project, face authentication is done before the test and Arduino Mega will interface with IR sensors and limit switches to monitor the test. The test results are shared with the applicants through their mobile using the GSM module. Experimental results suggest this method to be faster and efficient. The project outcome ensures that only skilful applicants are provided with e-licence and would effectively reduce the number of road accidents.

Keywords - Arduino Mega, GSM module, OpenCV, limit switches, RTO.

I. INTRODUCTION

The human population of the country has increased rapidly over the past years and consequently resulted in an increased number of vehicles on road. As the requirement of drivers goes high, the quality of drivers comes down. This is one main cause of the detonating numbers of road accidents. The quality of drivers is primarily judged by providing a driving license issued by the government.

Many drivers don't see the importance of having a driving licence but it is essential to have one. According to the National Crime Records Bureau(NCRB), an average of 4 lakhs accidents happen every year in which approximately 1.5 lakhs people's life is lost. Many accidents are caused by drivers who don't have a license and few others are caused by unskilled drivers indeed having a licence. Thus, there is a high need for ideas and ways in which accidents can be reduced and avoided.

This paper proposes a modern way of issuing e-Licence to the drivers and also to eliminate the RTO authority's interference in biased decisions. The process of issuing e-License to only skilful drivers will effectively reduce the number of road accidents.

II. LITERATURE SURVEY

The literature survey is accomplished by reviewing several papers and connecting them all in this paper.

The method of "Face detection and tracking using OpenCV" [1] explains an application for detecting faces in the video or camera based on Adaboost, Haar cascades algorithms. The paper "A real-time GSM/GPS based tracking system based on GSM mobile phone" [2] has been demonstrated as a GPS based tracking system that keeps track of the location and speed of the vehicle based on a mobile phone text messaging system. The system can provide the feature of text notification for speed and location. An article "Automated driving test System" [3] describes the automation of the driving test to drive over the customized path with a fingerprint authentication process. A method of "Automation of driving licence test using wireless sensing network" [4] describes sending the data wireless sensing network to the remote server to get processed. The result will be evaluated based on the output of the received data with previous data.

III. PROPOSED SYSTEM

The proposed system is featured with face authentication and Arduino Mega will interface with the sensors and limit switches to monitor the test.

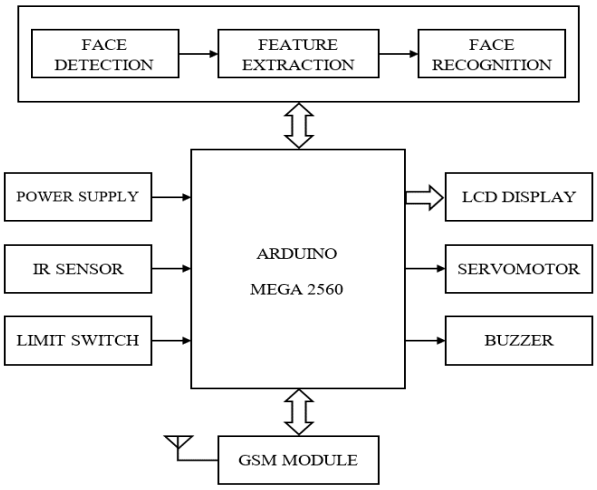

Fig. 3.1. Block Diagram of the Proposed System

As shown in fig. 3.1, the block diagram of the proposed system consists of two major blocks. The upper block belongs to the computer system used for the face authentication process. OpenCV software library bounded with python programming is used for this purpose. It uses the computer vision algorithm, where the Haar Cascade classifiers are taken into considerations. The lower block belongs to the hardware system, where Arduino Mega is the controlling unit. It is interfaced with a GSM module, IR sensor, LCD, servo motor, buzzer and limit switches.

IV. WORKING PRINCIPLE

The working of the proposed system is shown in the flowchart. Fig. 4.1 explains the overall working process of the system.

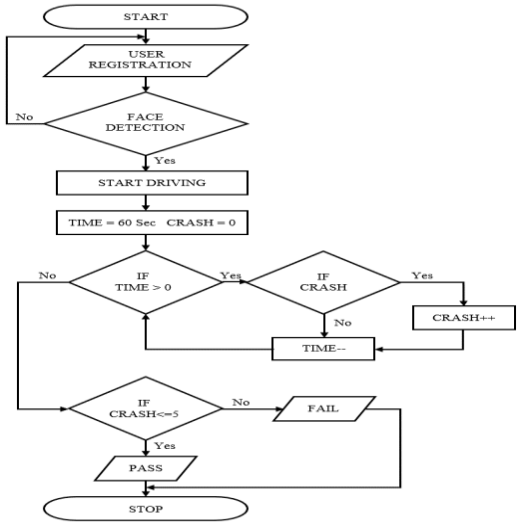

Fig. 4.1. Flow Chart of the Proposed System

A new applicant has to register his face for the authentication process before the driving test. During the test process, the applicant's face is detected and recognised using the OpenCV library. If the face matches with the earlier trained face details, then the applicant's details are displayed on the serial monitor. If it doesn't match, the applicant has to start the registration process again.

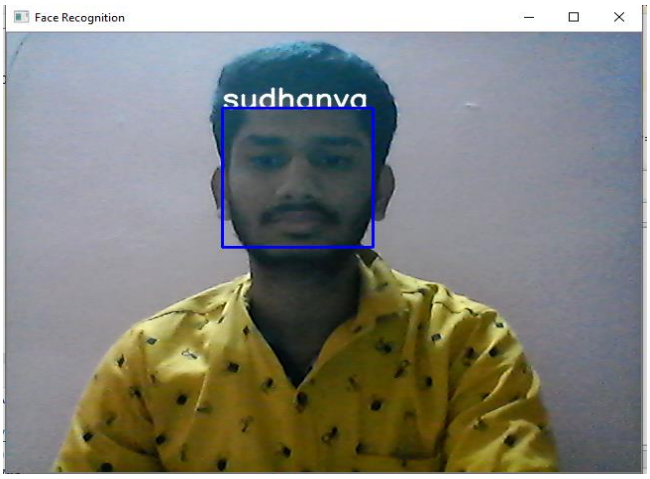

Fig. 4.2. Face Authentication using OpenCV

Face detection is done using OpenCV software that uses the Haar cascades function having pre-trained classifiers in form of eyes, nose, smiles, etc. Face detection using OpenCV is shown in fig. 4.2.

After successful authentication, the gate controlled by the servomotor is opened, and the traffic light signals are shown. If a green LED signal is received, the applicant has to start driving through the customised track equipped with IR sensors and limit switches. The IR sensor detects the forward and backward motion of the vehicle on the sloppy track. The experimental setup is shown in fig. 4.3.

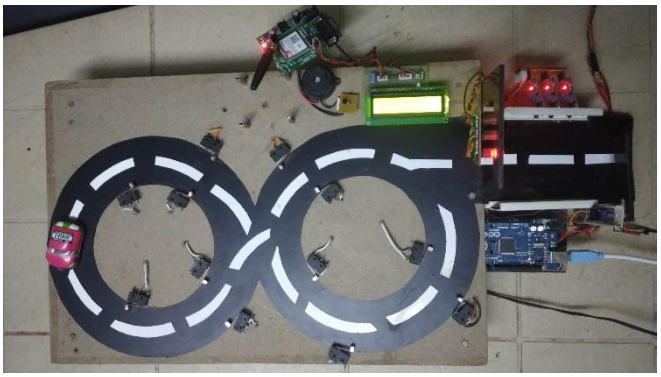

Fig. 4.3. Experimental Setup

As shown in fig. 4.3, the limit switches are placed at certain points which are used to detect vehicle crashes. The

number of crashes made by the applicant while driving is sensed and counted. After the driving is completed, the crash count is analysed and used in the determination of the driving test result.

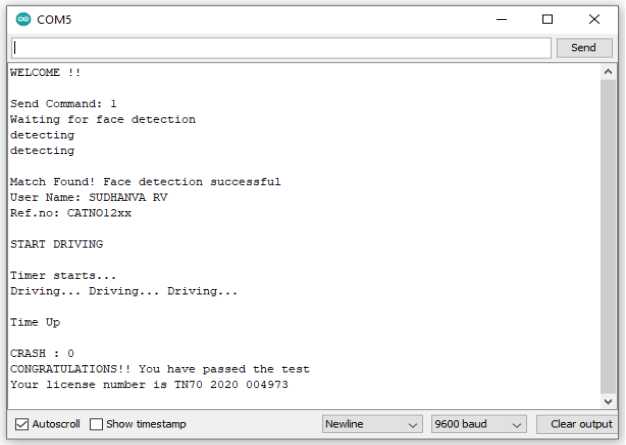

Fig. 4.4. Arduino IDE serial monitor

According to this system, a total of five or fewer crashes are considered as passed. If the applicant makes more than five crashes, the result is considered to be failed. Fig. 4.4 shows the Arduino IDE serial monitor used to track the test process and send commands to the Arduino Mega. The test result is sent to the applicant's registered mobile number using the GSM module, also displayed on the LCD.

V. RESULT & DISCUSSION

An automated system used for driving licence tests is developed and the experimental results of the system are verified. Thus, effective monitoring of driving tests is done with the system.

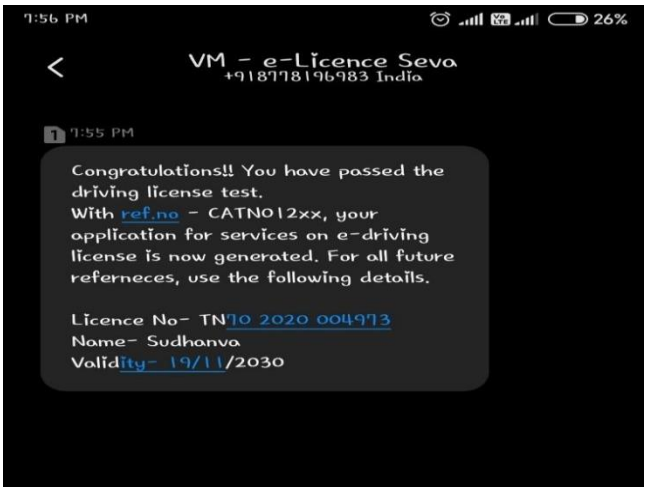

Fig. 5.1. Mobile SMS – Result Pass

If the applicant has passed the driving test, e-Licence is generated and sent to the applicant's mobile as shown in fig. 5.1. In fig. 5.2, the applicant's fail result is shown. If failed, the applicant is asked to apply for the test again for availing e-Licence.

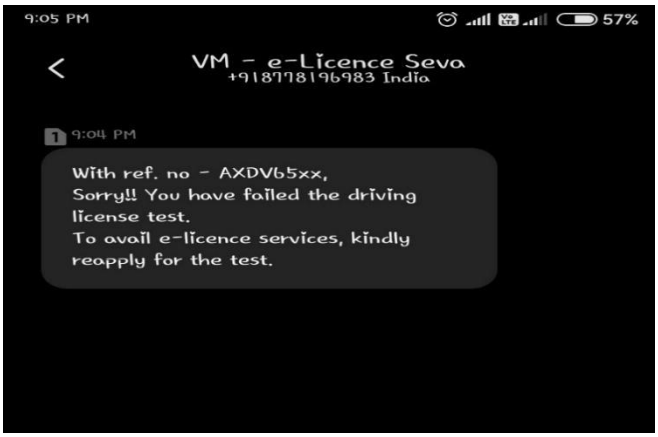

Fig. 5.2. Mobile SMS – Result Fail

Result generation is instant and saves time and paper work. The system brings transparency in the test by eliminating the RTO authority intervention in the results. Only the skilful applicants are provided with e-Licence. As a contribution to society, the risk of deaths in road accidents will be lowered by this system.

VI. FUTURE ENHANCEMENT

The system application can be upgraded by providing the e-Licence through e-mails to the applicants. Furthermore, map matching technique can be applied to the system that will track the vehicle movement. An application of cloud computing will be useful in storing and retrieving huge amount of details and of the applicants. The practical system can be implemented in real time.

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