SMART DRIVING LICENSE TEST

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Abstract: The project is regarding the automation of driving license testing system and updating the results to the person through registered mobile number. Usually, while driving test the person who requested for license have to show his driving skills ahead of the authorities. The person need to operate the vehicle according to several rules. If he fails, he/she are out and have to appear for the driving test next time. The Officials observe mistakes of the applicant physically. The proposed solution for the automation of existing manual test method permits the elimination of intervention of humans and improves the accuracy of driving test thereby going paperless, with Driving Skill Evaluation System. In the proposed system, we take data from sensor as inputs from hardware simulator and stores into the database. In this system, the person participating in the test are observed by sensors. Therefore whether the person is qualified or not is informed to the applicant as well as the authorities. Gradual increase in number of road hazards are due to less practice in driving and illegal driving license given to the unskilled drivers by taking bribe. To beat this drawback, automated driving license test will be advantageous. The solution is introduced for ensuring the quality in approving in license to enhance safety. Normally, In driving test a candidate applied for license have to drive over a test track in front of the authorities. The candidate has to drive over the path with specific rules and if he/she fails to do so he/she will be disqualified and should try next time. These authorities watch the errors of the candidates manually. The Arduino system with necessary sensor modules has been developed for watching the candidate for getting their license. By using this system, the candidate who take up the test are monitored and the result whether the candidate is passed or failed is updated to the candidate as well as the authorities wirelessly using GSM module. The monitoring of the driving test ground is done autonomously using the Arduino system. This system is developed for improving the standards of license issuing mechanism in order to improve road safety and as well as to prevent bribery.

Keywords : Hardware Simulator ,Automation, Database, Sensors.

I. INTRODUCTION

A driver's license is an official document, often plastic and the size of credit card, permitting a specific individual to operate one or more types of motorized vehicles, such as a motorcycle, car, truck, or bus on a public road. The laws relating to the licensing of drivers vary between jurisdictions. In some jurisdictions, a permit is issued after the recipient has passed a driving test, while in others, a person acquires their permit before beginning to drive. Different categories of permit often exist for different types of motor vehicles, particularly large trucks and passenger vehicles. The difficulty of the driving test varies considerably between jurisdictions, as do factors such as age and the required level of competence and practice. The minimum driving age in India is 16 for mopeds under 50, and 18 for cars and motorcycles of more than 50 cc. The Regional Transport Office (RTO/RTA) issue their own driving licenses in various states. Drivers are legally required to carry a valid driving permit in India whilst driving, and it must be shown if asked to do so by a police officer. In India, people aged 50 or more, have to undergo strict medical tests in order to obtain a permit that has limited validity and requires renewal every five years. A Commercial Driving License is valid for 3 years and then requires to be renewed. Nowadays getting a driving license is an important thing in every adult's life. The RTO office issues the license to a trainee provided the trainee passes the prescribed test. These tests should challenge the capability of the trainee in every way possible. The candidate must be perfect and confident in driving. In the end, the applicant has to earn the license. Road safety is an issue of national concern as it impacts on the economy, public health and general welfare of the people. More than 85% of traffic is carried out by road transport because of easy availability of roads, adaptability to individual needs and cost savings. The survey conducted by International Finance Corporation implies that most of the road accidents are happening because of improper knowledge about how to drive the vehicle. The other survey conducted shows that 54% of the license holders are not having the proper knowledge of driving the vehicle. In this project we are presenting an automated driving license test capable of testing the knowledge and mental awareness of the person while driving a vehicle so as to improve the standard of license issuing mechanism in order to improve road safety in a country. This automated system is done by interfacing Arduino UNO board with number of sensors, these sensors are kept on the test track to identify the errors of the candidate while he/she is taking the test. Arduino UNO microcontroller reads the data collected by sensors, processes them and send the result information to the candidate and authorities of RTO whether he/she is passed or failed to get a driving license.

Now-a-days in our country most of the existing RTO offices did not have systematic driving license verification system. If we want to get the driving license from RTO office, it is not a difficult task now a days but maintaining the original driving license is major task to the vehicle users. On the other side vehicle users are cheating the police by maintaining fake license which is a crime. Currently driving license card having details like driving license identification number and address details of the authorized vehicle drivers. So now-a-days the persons who are maintaining fake driving license, they are removing the authorized vehicle driver license photo and the details and using same license identification number. This is the major disadvantage for the authorized driving license persons and it is advantage for the persons who are maintaining fake driving license. In order to overcome these problems an authenticating driving license system is proposed and provided to RTOs. By making use of RFID reader we can maintain authenticated driving license system. The existing method at the road transport officers is that we need to fill the online driving license application form and next step is the written exam, that exam issuing a driving license by taking photo and the details of the eligible person. So in that driving license as we already know there existing a license identification number also called serial number. It is easy for changing the authorized person serial number or photo or details. This is the major drawback of the existing driving license issuing system.

II. PROBLEM STATEMENT

The existing driving license test consists of problems that needs to be solved are as follows,
• Manual method used in obtaining driver's license provides less precise results than automated method.
• One or more inspectors must be present at the driving field for long hours.
• There are chances of bribery and cheating in obtaining the driving license.

OBJECTIVES

The project proposed for automation of driving license test has following objectives,
• The main aim of this project is to provide automation in the driving license process.
• To implement efficient and cost-effective driving license test.
• To make simple and ease process for getting driving license and serving equity in test process through automation.

## III. METHODOLOGY

3.1 EXISTING SYSTEM

In the Existing System of driving test, the candidate applied for license have to be need to drive the vehicle within the test track in front of the Regional Transport Officers. The Officers observe the movement of vehicle driven by the candidate. If the candidate make any mistakes while driving the vehicle, he/she will be disqualified and is not eligible for getting the driver's license. He/she will have to improve their driving skills and will have to appear again for the driving test. If the candidate does not make any mistake, he/she will be obtaining the permanent driver's license by Regional Transport Office (RTO).

3.2 PROPOSED SYSTEM

In the proposed system, we are overcoming the drawbacks from the existing system. In the system proposed the Learner License Registration (LLR) is provided to the candidates by getting the users information and verifying the information. On the test drive date after submitting the LLR, then the person will be allowed for test. Driving capacity will be evaluated by checking if the person can clear the tests without fail. If the candidate completes the test successfully with required tests, then microcontroller will mark the candidate application as approved otherwise it will be marked as unapproved. The test are monitored and the result whether the candidate is passed or failed is updated to the candidate as well as the authorities wirelessly using GSM module. So there will be no change of approving the ineligible driver.

IV. IMPLEMENTATION

Arduino UNO is used as the micro controller and Analog sensors such as IR sensor, Ultrasonic sensor and crash sensor(limit switch) are used in test to track conditions. RFID, GSM module, LCD display are the digital modules, that are used for displaying results. All the connections are wired and have a serial communication interface with the micro controller. The sensors such as ultrasonic sensor, IR sensor, Crash sensor, RFID and LCD display are used for this process. The Arduino UNO is used as a microcontroller which has 8 Analog pins and 13 digital pins which has RX and TX for serial communication, with 5 volts power supply.
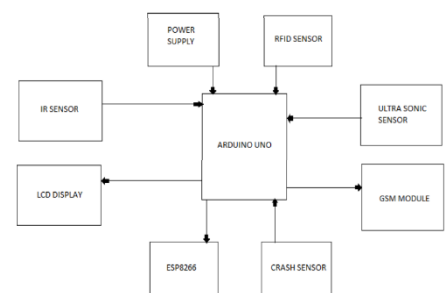

Block Diagram

4.2 WORKING

In this project three tests are conducted in order to check the person ability to handle vehicle, they are
(i) Ramp Test.
(ii) Curve Test.
(iii) Parking Test.

The trainee has to scan the RFID card which holds all the details and then the gate is opened. In the ramp test, IR sensors are used to check if the trainee can clear an inclined path without backing the vehicle. In the parking test, the trainee should park the vehicle in a given parking space, which is monitored by ultrasonic sensors. In the curve test, the trainee is provided with a path such as 8 which is planted with crash sensors, the trainee should successfully clear the test without crashing to the walls. The Arduino system collects the data. The score from each test is taken and displayed on a LCD display, saying the trainee is passed or failed. The result is sent to the candidate registered mobile that can be viewed easily.

5.3 Flowchart

The flowchart of the driving license system is shown in the Figure . To receive the driving license one must go through few tests. At first, the Ramp test of driving license system is done and the result of this test is recorded. The result of the second test called the curve test where the candidate should drive through the curve is also recorded. After the curve test is the parking test, where the candidate has to park vehicle in the given space and the result of this also is recorded. Now all the three test's results are added. We have set a particular score to pass in the test; the candidate has to reach the particular score to pass in the test. If the candidate doesn't attain the particular score, the candidate's result is shown as fail and the candidate is not eligible to receive the driving license. The results will be displayed in the LCD.
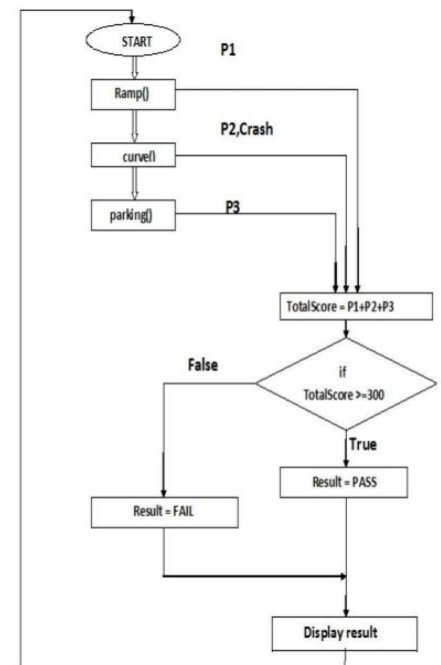
Flowchart

V. COMPONENTS USED

5.1 Arduino Uno
The Arduino Uno board is a microcontroller based on the ATmega328. It has 14 digital input/output pins in which 6 can be used as PWM outputs, a 16 MHz ceramic resonator, an ICSP header, a USB connection, 6 analog inputs, a power jack and a reset button. This contains all the required support needed for microcontroller. In order to get started, they are simply connected to a computer with a USB cable or with a AC-to-DC adapter or battery. It is used to collect and process data to declare results od driver's license in this project based on programming.

5.2 Crash Sensor
The switch 10T85 is a snap action switch. It is connected internally in such a way that the pins 1 and 2 are connected. The pin 2 is connected to pin 1 when the switch is closed. The limit switch is used as a crash sensor to detect whether any collisions occurring with vehicle during test.

5.3 RFID Reader
A radio frequency identification reader (RFID reader) is a device used to gather information from an RFID tag, which is used to track individual objects. Radio waves are used to transfer data from the tag to a reader. RFID is a technology similar in theory to bar codes. However, the RFID tag does not have to be scanned directly, nor does it require line-of-sight to a reader. The RFID tag it must be within the range of an RFID reader, which ranges from 3 to 300 feet, in order to be read. RFID is used as learner's license which is used to scan to enter the test with registered details of the candidate.

5.4 Infrared Sensor
An infrared sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measure only infrared radiation, rather than emitting it that is called a passive IR sensor. Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation. IR sensor is used to check whether the vehicle is passing the ramp at once or not with number of times of passing the ramp.

5.5 Ultrasonic Sensor
An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. Ultrasonic waves travel faster than the speed of audible sound. In order to calculate the distance between the sensor and the object, the sensor measures the time it takes between the emission of the sound by the transmitter to its contact with the receiver. The formula used for calculating distance is $D = \frac{1}{2} T \times C$. The Ultrasonic sensor is used in parking test to measure the distance between vehicle and the walls of parking slot.

5.6 Breadboard
A breadboard (sometimes called a plugblock) is used for building temporary circuits. It is useful to designers because it allows components to be removed and replaced easily. It is useful to the person who wants to build a circuit to demonstrate its action, then to reuse the components in another circuit. It is used for common connecting point for the components in the circuit such as VCC and ground.

5.7 LCD Display

A liquid crystal display or LCD draws its definition from its name itself. It is combination of two states of matter, the solid and the liquid. LCD uses a liquid crystal to produce a visible image. Liquid crystal displays are super-thin technology display screen that are generally used in laptop computer screen, TVs, cell phones and portable video games. LCD is used to display the necessary instruction that needs to be followed by candidate during test process.

5.8 GSM Module

The SIM900A is a complete Dual-band GSM/GPRS solution in a SMT module which can be embedded in the customer applications. Featuring an industry-standard interface, the SIM900A delivers GSM/GPRS 900/1800MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption. SIM900A can fit in almost all the space requirements in user applications, especially for slim and compact demand of design. It is used for wireless communication purpose like sending results to candidate registered mobile.

5.9 Jump Wires

A jump wire (also known as jumper, jumper wire, Dual Point wire) is an electrical wire, or group of them in a cable, with a connector or pin at each end which is normally used to interconnection of the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without the application of soldering.

5.10 Arduino IDE

Arduino is a both an open source software library and an open-source breakout board for the popular AVR micro-controllers. The Arduino IDE (Integrated Development Environment) is the program used to write code, and comes in the form of a downloadable file on the Arduino website. The Arduino board is the physical board that stores and performs the code uploaded to it.

VI. ADVANTAGES AND APPLICATION

6.1 ADVANTAGE

• **Ensuring transparency in the system by tackling corruption**: An automated driving license test can provide consistent and fair evaluations of drivers, regardless of the location or evaluator. This can help ensure that all drivers are evaluated using the same standards and criteria, resulting in fair and reliable assessments.

• **Time and cost efficiency**: An automated driving license test can be more time and cost-efficient than traditional driving tests. Since the test can be conducted in a controlled environment, it can be completed more quickly, reducing the time and cost involved in the test process.

• **Reduced risk:** An automated driving license test can reduce the risk of accidents during the testing process. Since the test is conducted in a controlled environment, the risk of accidents is minimized, allowing drivers to focus on demonstrating their skills without the added pressure of real-world driving.

• **More efficient testing:** Automated driving license tests can be more efficient than traditional driving tests, reducing the time and resources required for testing and evaluation by getting data through sensors.

6.2 APPLICATION

• **In RTO Driving test zones:** An automated driving license test could be implemented in RTO (Regional Transport Office) driving zones to improve the efficiency and accuracy of the licensing process.

• **Private practice zones:** Automated driving license tests could be used in practice zones to test and train drivers in a controlled environment before they are allowed to operate on public roads. Practice zones are areas that are set up specifically for testing and training candidates.

• **Training zones:** An automated driving license test could have several applications in training zones, where new drivers are taught how to operate a vehicle and navigate the road in controlled environment.

• **Racing tracks for crash monitoring:** In racing, high-speed crashes are a concern for both drivers and track officials. An automated driving license test could potentially be used to monitor crashes and provide valuable data for safety improvements.

FUTURE WORK

The development of automated driving technology is rapidly advancing, and it is likely that we will see more autonomous vehicles on the roads in the future. As a result, the way we test and license drivers may need to be adapted to reflect these changes.

One possibility is that the driving license test could include a section on automated driving systems. This could involve testing the driver's knowledge of how these systems work, their limitations, and how to operate them safely. It could also involve testing the driver's ability to take control of the vehicle in the event of a system failure or unexpected situation.

Another possibility is that the licensing process could be adapted to include training on automated driving systems. This could involve a combination of classroom instruction and hands-on experience with these systems, to ensure that drivers are comfortable and competent in their use.

In addition, it may be necessary to develop new regulations and standards for automated driving systems, to ensure that they are safe and reliable. This could involve working with manufacturers to develop standards for these systems, and developing testing protocols to ensure that they meet these standards.

Overall, the development of automated driving technology is likely to have a significant impact on the way we test and license drivers. It will be important to develop new training and testing programs to ensure that drivers are prepared to operate these vehicles safely, and to develop new regulations and standards to ensure that these systems are safe and reliable.

CONCLUSION

In this project problems faced by a normal candidate for getting a driving license without corruption or influence is done by automation of driving license test, this project can be installed on every driving license track. In conclusion the candidate must complete all the required tests for getting a driving license using various sensors and that data is stored in micro controller and based on the predefined instructions the test will be validated and the result will be sent to applicant registered mobile and for office for keeping track of further processes and candidate will be sent a message about test result and the next slot scheduled if the test is failed. Since the components used in the project are easily available and less cost it is easy to be replaced. The automated driving license test is an appropriate and efficient way of testing the candidates ability to handle vehicle under different conditions making him a proficient person.

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