SMART DRIVING TEST TRACK

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Abstract - "Smart Driving Test Track" has been designed to automate the process of issuing driving license. The system is developed for improving the standards of license issuing mechanism in order to provide road safety. In the proposed system we are going to design commonly used Reverse S shaped track.

The objective of this setup is that, to change traditional system of issuing driving license and make system automated. The limitations of manual process are eliminated in proposed system. This system is designed to reduce the road accidents due to untrained license holders.

1. INTRODUCTION

1.1 Problem Definition:

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 imply that most of the road accidents on road are happened because of improper knowledge about how to drive the vehicle. The another survey conducted shows that the 54% of license holders were not having the proper knowledge of driving the vehicle[2].

1.2 Solutions and effects:

In the present scenario, the examiner (Regional Transport Officer) must be on the field during the test. RTO himself fixing his stare at the many number of test takers undertaking their license test. This in fact leads to common human error like observation, favoritism and corruption [4]. One or more inspectors from motor vehicle department has to stay long hours in the fields.

To overcome this problem we are introducing smart driving test track which will eliminate on field monitoring of ground test by Regional Transport Officer. This technology for skill assessment of obtaining driving license will reduce corruption and thereby helps the government to select only the efficient drivers. This system is designed in order to reduce road accidents due to untrained license holders, to make license issuing process transparent, automated and corruption free.

1.3 Proposed Work:

In the “Smart Driving Test Track”, the reverse S shaped track is automated by using ultrasonic sensors and sharp IR sensors. Ultrasonic sensors are placed along sides of the track and sharp IR sensors are deployed on the middle of the tracks. Echo of the ultrasonic sensors transmits the sound waves. If there is any car on the track then waves reflected to trigger of ultrasonic sensor, similarly transmitter of IR sensor transmits the infrared rays and it get reflected due to the car. The output of ultrasonic sensors and IR sensors is given to the analog pins of arduino uno. Arduino uno is 8 bit microcontroller. If test taker complete all the three tracks without any mistake and in stipulated time then Regional Transport Officer (RTO) will get the message that driver has successfully completed the test through GSM which is interfaced to arduino. If there is mistake by the test taker or test is not completed in stipulated time then Regional Transport Officer (RTO) will be informed by message that test is unsuccessful through the GSM.

In this way this setup reduces manual interference in the process of driving license issuing process. This makes the overall process transparent, accurate and corruption free.
2.1 Hardware Implementation:

- **Sensor unit**: The sensor unit consists of ultrasonic sensors and IR sensors. The output of the ultrasonic sensor and IR sensor is the input for the Arduino.
- **Control unit (Arduino)**: The main control unit consists of Arduino. Arduino software is an open-source software and it makes easy to code and upload it to the board. The power supply is given to the Arduino of 9-12V DC.
- **Power supply unit**: 12V power supply is used in the system. It mainly used to provide DC voltage to components on board.
- **GSM unit**: SIM 900A module is used to send the result of the test to the RTO through a message. It operates either at 900MHz or 1800MHz frequency band.

2.2 Software Implementation:

Flowchart of smart driving test track

Above figure shows flowchart of “Smart Driving Test Track”. The process of driving license test will be done as follows:

1. **Control unit (Arduino)**: The main control unit consists of Arduino. Arduino software is an open-source software and it makes easy to code and upload it to the board. The power supply is given to the Arduino of 9-12V DC.

2. **Sensor unit**: Sensor unit consists of Ultrasonic sensors and sharp IR sensors used to sense the mistakes of the driver.

3. **GSM**: SIM 900A module is used to send the result of the test to the RTO through a message. With the help of GSM module interfacing short text message can be send to required RTO office. It operates either at 900MHz or 1800MHz frequency band.

4. **Power supply unit**: 12V power supply is used in the system. It mainly used to provide DC voltage to components on board.

Present Theories and Practices

In the present situation, there are two examinations conducted while issuing the driving license. Theoretical examination is conducted before practical examination [2]. Basic understanding of traffic signs, traffic regulation and safety check before using vehicle are evaluated in theoretical examination. In the practical examination driving ability of the driver is evaluated.

This overall process is manually operated. There is need of extra staff for conducting all these tests. This manual process of issuing driving license may give less accurate results.
Conclusion:

The proposed system of automated driving license issuing process is advantageous over existing manual process. It will help to reduce the road accidents due to illegal licenses. This system will assure that only well trained drivers can get the license. It can be concluded that this setup will help Regional Transport Officer (RTO) officers to maintain records systematically and it will increase transparency in driving license issuing process and also speed of process.

References:


BIOGRAPHIES


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