A Smart Driving License System in RTO Using Quantum Machine Learning Techniques

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***Abstract*:- This paper presents about the automation of driving license test system. We planned to automate or digitalize a mechanical work into a computerized one. And the mechanical work that got our eye is license system in India. The current existing system in India completely involves human work starting from applying; verifying, inspecting and issuing the license involves human interference. Normally, in driving test a candidate applied for license have to drive over a closed loop path in front of the authorities. The candidate has to drive over the path without any support over the land surface and if he fails to do he will be disqualified. For that, the authorities watch candidate manually. The proposed system will automate the bike driving test by replacing human with our device and also evaluating the total process. This will help to reduce manual interference and have unbiased results. One of the finest tasks in this is to automate the inspection of driving test. Our idea is going to examine the drivers driving capability through technology and able to avoid brokerage and loss of money. The solution offered, proved to be a perfect example for an Embedded System application.**

Keywords: Quantum Machine Learning, Digital India, Smart Driving License

1. INTRODUCTION

Now-a-days in our country most of the existing RTO offices didn't 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 [1]. On the other side vehicle users are cheating the police by maintaining fake license which was crime. Currently driving license card having details like driving license identification number and address Details of the authorized vehicle Drivers are being morphed. 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 [2]. 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 was 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 [4]. So in that driving license as we already know there existing a license identification number also called serial number. It is easy to morphing the authorized person serial number or photo or details [10]. This is the major drawback of the existing driving license issuing system.

2. PROPOSED SYSTEM

In the proposed system, we are overcoming the drawbacks from the existing system. In our system we are providing the LLR to the persons by getting the user's information and verifying the information by using biometric sensor. On the test drive date after submitting the LLR, then the person will be allowed for test. Driving capacity will be evaluated by checking whether the foot is on the foot rest or not while doing the test by using IR sensor implemented in the vehicle. This IR checking is followed by detecting other IR implemented in test lane by the vehicle. If the person completed the test successfully by detecting the IR once again, then microcontroller will marked as approved otherwise it will be marked as unapproved along with buzzer alarm. All the status will be uploaded in the web page using IOT module for DTO and also will be displayed through LCD. So there will be no change of approving the in eligible driver.

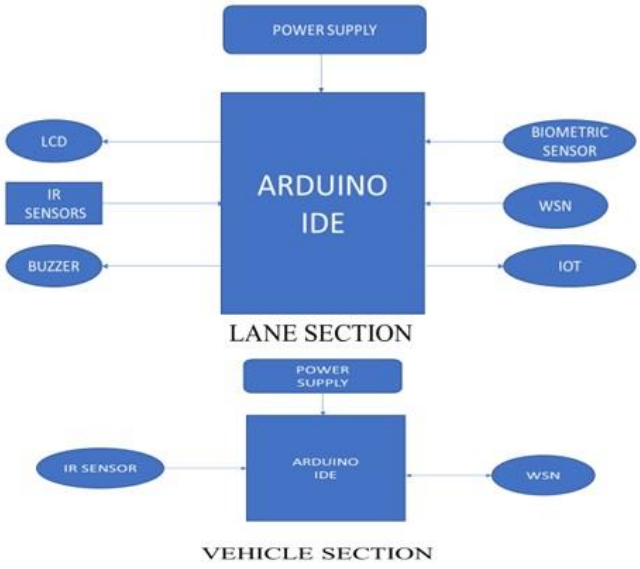

Fig.1 Block Diagram

The system design consists of an arduino UNO board which acts as the brain of the entire idea. Atmega328p is the controller used in the arduino which is booted by an embedded c program using Arduino IDE [8]. Arduino and all the other sensors are powered by a 12Vstep down

transformer which converts 230V into 12V. An 8-bit analog-to-digital converter is used to convert the 12V AC into 12V DC and supplied to all the sensors. We use four sensors to analyses the ability of the driver. They are force sensor, MEMS accelerometer sensor, footrest sensor and gas sensor. All these sensors are connected to the arduino board [5].

Force sensitive sensor varies its resistance based on the pressure applied in the sensing surface. Accelerometer sensor is used to measure acceleration, tilt angle, inclination, rotation, vibration, collision, gravity and how quickly changes speed. It also tells about the X, Y, and Z axis movement of vehicle. Footrest sensor is a piezoelectric switch which tells about the ON/OFF condition. Gas sensor monitors the atmospheric gases and detects the concentration of methane, butane and propane [9]. We use a 16x2 LCD display to show the sensor values.

The CC2500 (zigbee) module gives hardware support for packet handling, data buffering, burst transmissions, clear channel assessment, link quality indication and wake on radio. They tolerate low data rates and are used for short range applications. They support asynchronous and synchronous serial receive/transmit mode [6]. The serial communication is possible through UART converter. The UART IC converts TTL logic into recommended standard logic.

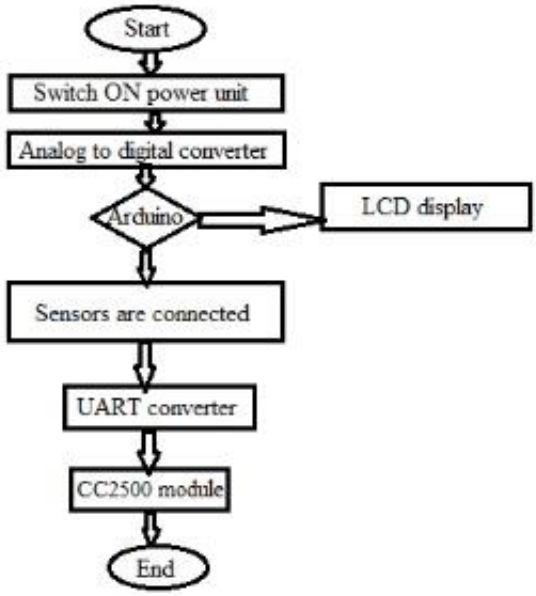

Fig.2 Flowchart of Hardware

The transformer is switched ON and the AC power is converted into DC using an ADC. This power is supplied to all the sensors which are connected to the arduino [7]. After getting the values from the corresponding sensors, they are displayed on the LCD. The arduino is connected to the CC2500 module on the transmitter side for serial communication.

3. IMPLEMENTATION USING SOFTWARE

Arduino IDE software is used with embedded c language. The analog pins of the Arduino board are used by the sensors to record their values. This acts as the transmitter side.

4. EXPERIMENTAL ANALYSIS

The concept makes use of Virtual Basics (VB.net) software for simulation purpose. It gets the personal details from the driver and saves it in the database. During the test drive, sensors automatically keep updating the values and are saved in the form of graph.

Motor vehicle rider must show their driving abilities on a zigzag path. If the rider skirts the sides on any of the path, sensors will send signals to the RTO where it will be noted and corresponding marks will be deducted. In the automated riding license test, the driver cannot accuse the RTO officer of intentionally failing him/her in the driving test. All the motions of the bike driven by the driver on the path will be noted. Co-emission is controlled and reported automatically.

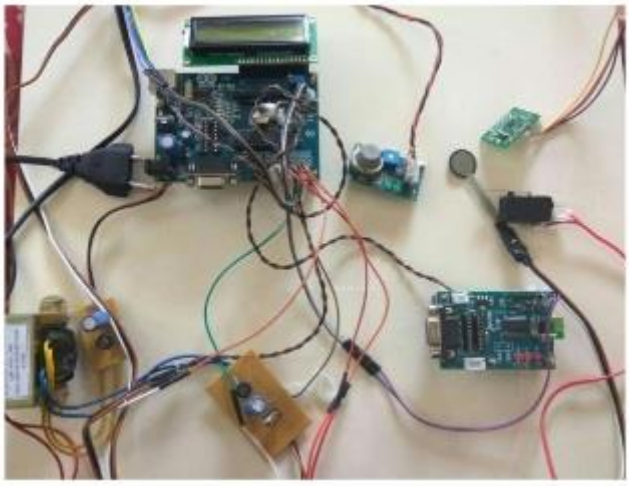

Fig.3 Prototype of Hardware Module

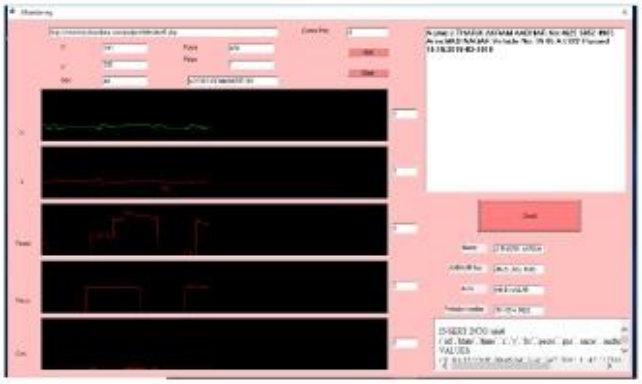

Fig.4 Verifying personal details in the server

5. CONCLUSION

The Driving Test Automation (DTA) System presented in this paper expedite the testing of candidates aspiring for a driving license in a more efficient and transparent manner, as compared to the present manual testing procedure existing in most parts of Asia and Pacific region. The manual test procedure is also subjected to multiple limitations like time consuming, costly and heavily controlled by the experience of examiner in conducting the test. Designing a track using LASER and LDR develops this technological solution for verifying driver's eligibility.

6. REFERENCES

[1] Ackerman, M. L., Edwards, J. D., Ross, L. A., Ball, K. K., & Lunsman, M. "Examination of cognitive and instrumental functional performance as indicators for driving cessation risk across 3 years", The Gerontologist, Vol.48, pp.802-810.2010

[2] Ragland, D. R., Satariano, W. A., & MacLeod, K. E., "Driving cessation and increased depressive symptoms", Journal of Gerontology: Medical Sciences, Vol.60A, pp.399-403, 2005'

[3] Cejun Liu, Dennis Utter, and Chou-Lin Chen, "Characteristics of Crash Injuries Among Young, Middle-Aged, and Older Drivers", Technical Report of National Highway Traffic Safety Administration in USA, 2007-11

[4] Geofrey Underwood, Peter Chapman, Neil Brocklehurst, Jean Underwood and David Crundall, "Visual attention while driving: sequences of eye fixations made by experienced and novice drivers", Ergonomics, Vol.46, No.6, pp.629-646, 2003

[5] Janke, M. K., "Age-related disabilities that may impair driving and their assessment", Washington, DC: California Department of Motor Vehicles, 1994

[6] Paper to study and develop authentication services using data embedded in smart card driver's license. November 24, 2009. NTT Data Corporation.

[7] P.Siva Nagendra Reddy et. Al., "RFID and GSM Based Advanced Postal Data Communication" IJIRCCE, Vol 3, Issue 6,2015.

[8] Mohit John and Arun Joseph "Zigbee Based Wireless Data Acquisition Using Lab view For Implementing Smart Driving Skill Evaluation System" International Journal of Instrumentation and Control Systems (IJICS) Vol.3, No.3, July 2013.

[9] D. Sarathkumar, C.K Sathish Kumar, S. Nithya and E. Thilagavathi "Automatic Two Wheeler Driving License System by Using Lab view" International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering Vol. 5, Issue 4, April 2016.

[10] Komal A. Margale, Priyanka M. Pawale, Amruta A. Patil, Jyoti Waykule" Driving License Test Automation Using VB" International Journal of Engineering and Applied Sciences (IJEAS) ISSN: 2394-3661, Volume-2, Issue-4, April 2015.