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Automatic License Issuing System

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Abstract: *This project focuses on automatic riding pattern recognition based on monitoring the driver behaviour. To prevent illegal licenses and therefore causing accidents, a new automated system is proposed. The proposed system need to design the wireless sensor network and also the multi sensor fusion based detection approach for detecting result. The map management is also needed to compare the test data from Vehicle data Recorder (VDR) with reference data. Mapping and multi-fusion sensor combination transmission is done using remote server. The proposed system is the elimination process of existing process to issue Indian driving license. For this applicant will be allotted the test vehicle for test drive with the number of sensors connected embedded in vehicle sending data using wireless sensor network to remote server to get processed. Result analysis is done by comparing the received data with previous data.*

Index terms – PIC controller (pic16F877A), LCD, ZigBee, Force sensor, Piezo sensor, MEMS, Gas sensor.

1. INTRODUCTION

Wireless Integrated Network Sensors (WINS) combine sensing, signal processing, decision capability, and wireless networking capability called zigbee which is a compact, low power system. On a local, wide-area scale, battlefield situational awareness will provide personnel health monitoring and enhance security and efficiency. Also, on a metropolitan scale, new traffic, security, emergency, and disaster recovery services will be enabled by WINS. Here first it identifies the node where the harmonic signals are produced by the strange objects and the intensity of the signal will be collected .The signal will be sent to the main node. The processing of the regular interval data from the nodes will be analyzed and based on the intensity of the signals and the direction of the detecting nodes gets changing will be observed and the results will be sent to the satellite communication system.

1.1 Force sensor:

A force-sensing resistor is a material whose resistance changes when a force, pressure or mechanical stress is applied. They are also known as "force-sensitive resistor" and are sometimes referred to by the initialism. For the best response of the sensor, is convenient placing them to the location. Where the effect of acting force is highest. In this case which is dealing with measuring on the handlebars, was the best solution placing the sensors close to the canter of the handlebars, near to the handlebars holder.

Fig-1: Force sensor

1.2 Piezo sensor:

Conductivity or Foot rest sensor is the measure of a solution's ability to pass or carry an electric current. The term conductivity is derived from ohm's law, E=I.R; Where Voltage (E) is the product of Current (I) and Resistance (R); resistance is determined by Voltage/Current. When a voltage is connected across a conductor, a current will flow, which is dependent on the resistance of the conductor. Conductivity is simply defined as the reciprocal of the resistance of a solution between two electrodes.

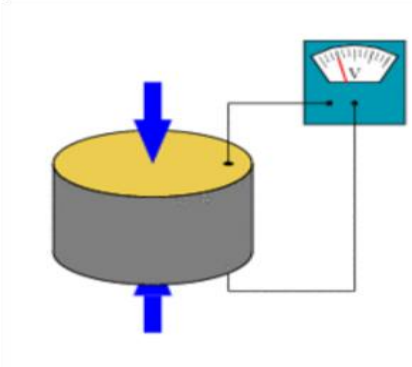

Fig-2: Piezo sensor

1.3 MEMS Accelerometer sensor:

These sensors are used to measure the acceleration produced by driver's body during the driving analysis. They usually consist of a central unit that process data (the microprocessor) and several components that interact with the surroundings such as microsensors. Because of the large surface area to volume ratio of MEMS, produced by ambient electromagnetism (eg, electrostatic charges and magnetic moments), and fluid dynamics (eg, surface tension and viscosity) and more important design considerations than with larger scale mechanical devices.

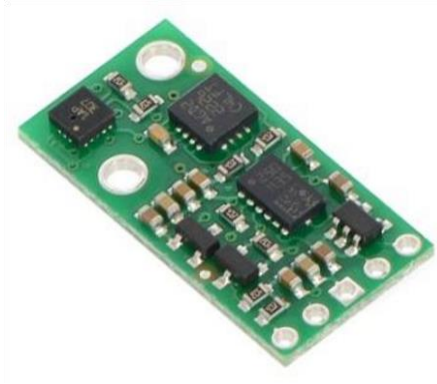

Fig-3: MEMS

1.4 Smoke sensor:

A smoke sensor is a device that senses gas/smoke. In this we consider the smoke produced is a device that detects the presence of gases in an area, often as part of a safety system. This type of equipment is used to detect a gas leak or other emissions and can interface with a control system so a process can be automatically shut down. A gas detector can sound an alarm to operators in the area where the leak is occurring, giving them the opportunity to leave. This type of device is important because there are many gases that can be harmful to organic life, such as humans and animals.

Fig-4: Smoke sensor

1.5 LCD:

A liquid-crystal display (LCD) is a flat panel display or other electronically modulated optical device that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in colour or monochrome.

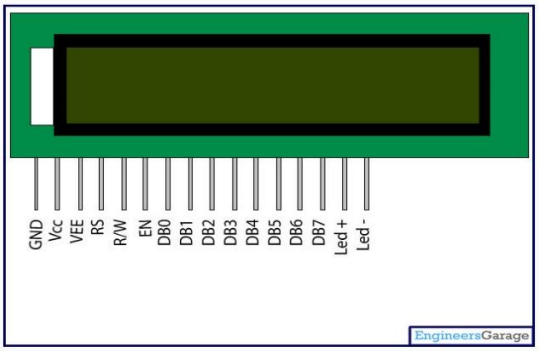

Fig-5: LCD

2. EXISTING SYSTEM

For all bike, to pass in driving test, he/she drive a bike in path designed as no. 8 in between the 20meter distance, for turning he/she should put a Indicator as well as show a hand signal and to stop the bike we raise our hand above the head. This should be done without our legs touching the ground. The motorcycle driving test is a standard test and all test centers use the same testing procedures. The test is designed to determine that you: Know the Rules of the Road and possess the knowledge and skill to drive competently in accordance with those rules.

Drive with proper regard for the safety and convenience of other road users. In conventional license system, there is no electronics based monitoring techniques involved. RTO officers checks the ability of the driver pattern manually.Travel route monitoring system is existed using GPS.Helmet wearing and alcohol detection based system is proposed in bikes.Detecting accurate driving pattern manually is challenging.

3. PROPOSED SYSTEM

The proposed project implements a real time machine-learning framework for riding pattern recognition. Riding pattern data are collected from accelerometer/gyroscope sensors mounted on motorcycles. Using an instrumented vehicle and an embedded data logger, experimental data are collected when different subjects drive a given sequence several times.

The goal is to create a machine-learning approach that can recognize the riding pattern from the collected

measurements. The results can be used to determine, from among the classified situations, those that are time critical events and/or near misses. This proposed project is also aims at monitoring the Emission of CO constraints from the vehicle and report it to the RTO station with CO sensor.

4. BLOCK DIAGRAM

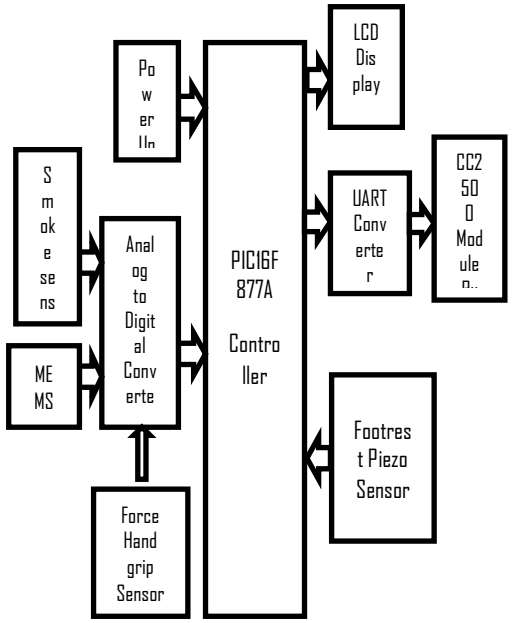

Fig-6: Transmitting side

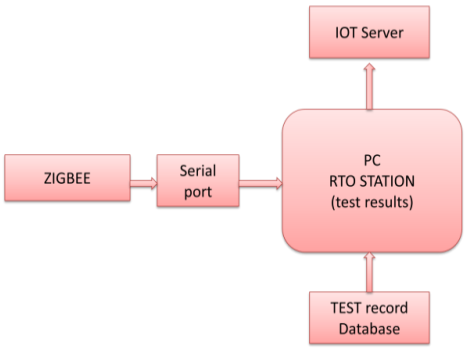

Fig-7: Receiving side

4.1 PIC16F877A Controller:

The PIC microcontroller PIC16F77A is one of the most renowned microcontroller in the industry. This controller is very convenient to use, the coding or programming of this controller is also easier. One of the main advantages is that it can be write-erase as many times as possible because it use FLASH memory technology. It has a total number of 40 pins and there are 33 pins for input and output. PIC16F877A is used is many pic microcontroller projects. PIC16F877A also have many application in digital electronics circuits. It finds its applications in huge number of devices. It is used in remote sensors, security and safety devices, home automation and in many industrial instruments. An EEPROM is also featured in it which makes it possible to store some of the information permanently like transmitter codes and receiver frequencies and some other related data. The cost of this controller is low and its handling is also easy. Its flexible and can be used in areas where microcontrollers have never been used before as in coprocessor applications and timer functions etc.

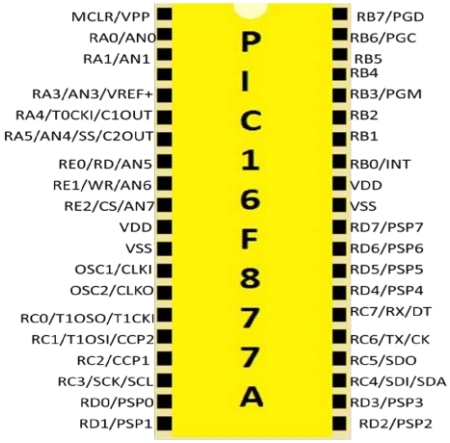

Fig-8: PIC microcontroller

4.2 RS 232:

In telecommunications, RS-232 is a standard for serial binary data signals connecting between a DTE (Data terminal equipment) and a DCE (Data Circuit-terminating Equipment). It is commonly used in computer serial ports. In RS-232, data is sent as a time-series of bits. Both synchronous and asynchronous transmissions are supported by the standard. In addition to the data circuits, the standard defines a number of control circuits used to manage the connection between the DTE and DCE. Each data or control circuit only operates in one direction that is, signaling from a DTE to the attached DCE or the reverse. Since transmit data and receive data are separate circuits, the interface can operate in a full duplex manner, supporting concurrent data flow in both directions. The standard does not define character framing within the data stream, or character encoding.Female 9 pin plug is used here.

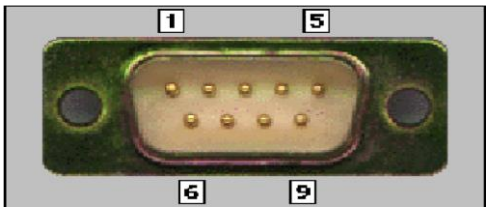

Fig-9: RS-232

4.3 ZigBee CC2500 module:

ZigBee is the name of a specification for a suite of high level communication protocols using small, low- power digital radios based on the IEEE 802.15.4 standard for wireless personal area networks (WPANs), such as wireless headphones connecting with the cell phones via short-range radio. The technology is intended to be simpler and cheaper than other WPANs, such as Bluetooth. Zigbee is targeted at radio-frequency (RF) applications which require a low data rate, long battery life, and secure networking. It provides extensive hardware support for packet handling, data buffering, burst transmissions, clear channel assessment, link quality indication and wake on radio. It can be used in 2400-2483.5 MHz ISM/SRD band systems. Low power consumption. High sensitivity (type 104dBm). Programmable output power – 20dBm ~ 1dBm. Operation temperature range 40 ~ + 85 deg C. Operating voltage: 1.8 ~ 3.6 volts. Available frequency at: 2.4 ~ 2.483 GHz.

5. OPERATION

This project work consists of four sensors force sensor, piezo sensor, MEMS sensors, smoke sensor respectively.

The PIC16F877A is a programmed with vision IDE and is connected to the LCD display and a receiver. Where the driving pattern analysis datum are collected in PIC and is transmitted to the receiver where the ZigBee CC2500 is connected through serial port. The datum that are collected by the receiver are transmitted to the RTO station and from that it get processed and the final result is stored in the IoT server to avoid the repeatation of same driver's documents.

6. RESULT AND DISSCUSSION

This method is used to analyse the driver's driving pattern so that many accidents could be avoided by this rash driving.It can reduce the use of manual selection of driver's licence, and to avoid the issuing of illegal licence. To avoid these illegal behaviours this method is implemented.

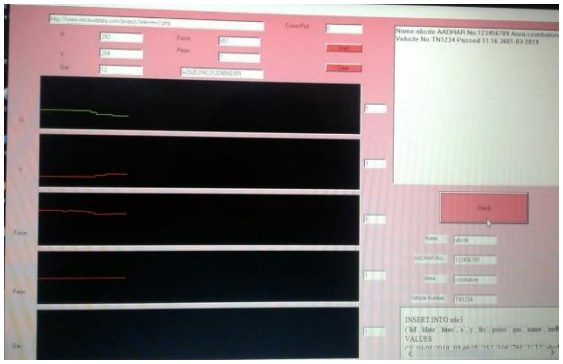

Fig-10: Software output

7. CONCLUSION

The on-line driving pattern recognition is achieved by calculating the feature vectors and classifying these feature vectors to one of the driving patterns in the reference database.This project is built with a method to identify driving patterns with enough accuracy and less sampling time compared than other manual driving pattern recognition.

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