

ELECTRONIC SYSTEM FOR ACCIDENT PREVENTION

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Abstract - Many accidents are happening due to driver's drowsiness and over speed and alcohol consumption. If these mistakes are corrected accidents can be reduced, not hundred percent but up to the satisfied level. If accidents occurred, immediate first aid and treatment is necessary to save life. We cannot expect a neighbor always to help the injured people. So by keeping these entire in mind a new idea is proposed which can automatically send a text message to ambulance service via GSM network. In order to prevent accident we are using alcohol sensor which alerts the owner such that "Drunk and Driving" and it will not allow engine to start. In case alcohol consumption is sensed at the time of driving, engine will slowly OFF after giving pre-warning sound. Steering wheel grip sensor is used to detect driver's drowsiness and alert the diver not to sleep. Temperature sensor is used to detect the engine temperature. MEMS accelerometer is used to detect the accident and record the speed and engine temperature in permanent memory for later reference.

Keywords – UART, ADC, PWM, GSM, MEMS accelerometer, Temperature, Alcohol, Grip sensors.

INTRODUCTION

1.1 An Overview of Existing system

When you think of work-related safety hazards, you probably think about what goes on inside the workplace. But one of the greatest threats to your safety is not in the workplace, but rather on the road. Someone is injured every 18 seconds. Over 2 million of those injuries turn out to be disabling. A person dies in a crash on roads every 11 minutes. In fact, motor vehicle accidents are the most common cause of death more than cancer or heart attacks. When we think about the serious accident, it could change your life- and not for the better. Before any new motorcycle model can ever go on sale to the public, it must first undergo a battery of testing to make sure it'll be safe, reliable and reasonably in tune with the demands of the motoring public. The government demands some of this testing, while other major components of it are devised by the companies themselves in an effort to ensure they meet specific standards for performance, fuel economy, comfort and other measures, but those which don't are axed.

There are three dominant causes of road accidents- drowsiness, Overtaking, Use of alcohols are related to driver. The main reason for driving drunk is that the police are not able to check each and every motorcycle and even if they catch any one the police can be easily bribed. So there is a need for an effective system to check drunken drivers.

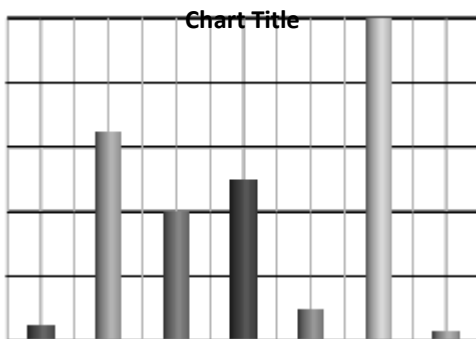


Fig.1

By observing above chart we are able to conclude that there are three dominant causes of road accidents- Negligence, Overtaking, Use of alcohols are related to driver. So there is a need for an effective system.

1.2. Proposed System

Our approach collects information available when a traffic accident occurs, which is captured by sensors installed on-board the vehicles. Based on this information, our system directly estimates the accident severity by comparing the obtained data with information coming from previous accidents stored in a database. This information is of utmost importance, for example, to determine the most suitable set of resources in a rescue operation. Since we want to consider the information obtained just when the accident occurs, to estimate its severity immediately, we are limited by the data automatically retrievable, omitting other information, e.g., drowsiness, temperature, speed etc.

2. BLOCK DIAGRAM

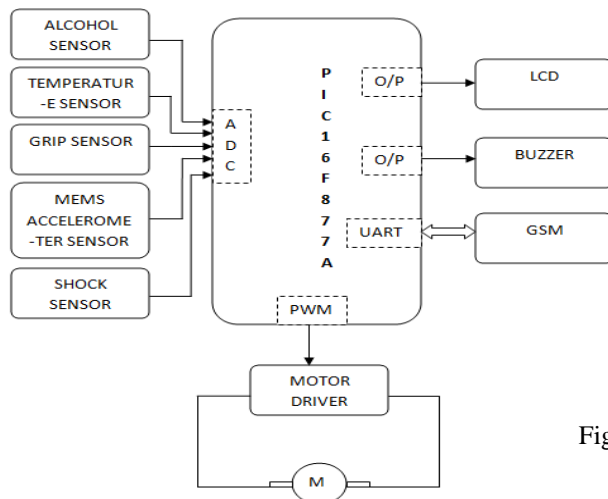


Fig.2

To convert the output of sensor into electrical form we will use signal conditioning (transducer). As controller operates only on digital data, so this analog data is to be converted into digital form by using ADC. But ADC is inbuilt in PIC. So the output of the signal conditioner circuit is directly connected to PIC. For speed measurement purpose we are going to use RPM counter. Nowadays the vehicles have a mechanical speedometer. The speedometers we have made use the digital technique. This displays the speed of vehicle in km/hr. The disc rotates through the optical assembly having infrared LED and phototransistor. The total assembly gives the digital pulses from which we can derive the RPM and speed of the vehicle. All this data will store & display on LCD also on computer whenever the accident switches are pressed which are placed in front of bike.

2.1. Hardware Description

PIC MICROCONTROLLER:

The heart of system is MICROCONTROLLER which will access the data.

- High-performance RISC CPU
- Only 35 single word instructions
- Low-power, high-speed CMOS FLASH/EEPROM technology
- Wide operating voltage range: 2.0V to 5.5V

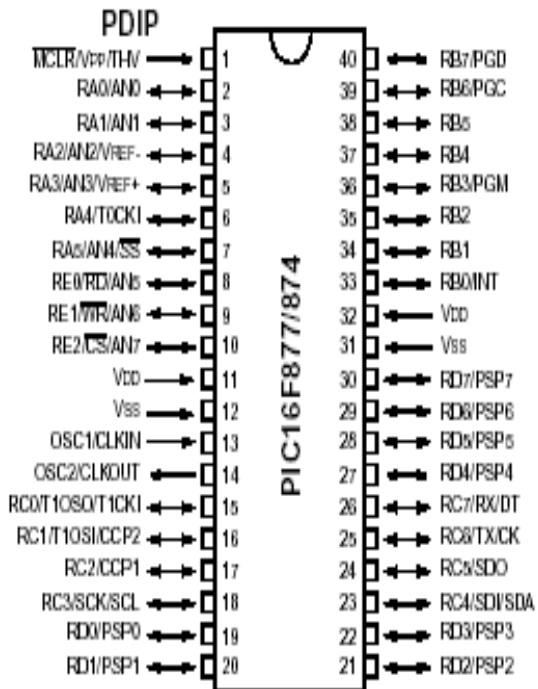


Fig .3

ALCOHOL SENSOR:



Fig.4

If the driver is found to have alcohol in the breath, it warns and then turns the ignition off and hence possibility of accident is avoided. MQ-3 gas sensor has high sensitivity to Alcohol, and has good resistance to disturb of gasoline, smoke and vapour.

- Good sensitivity to alcohol gas
- Long life and low cost

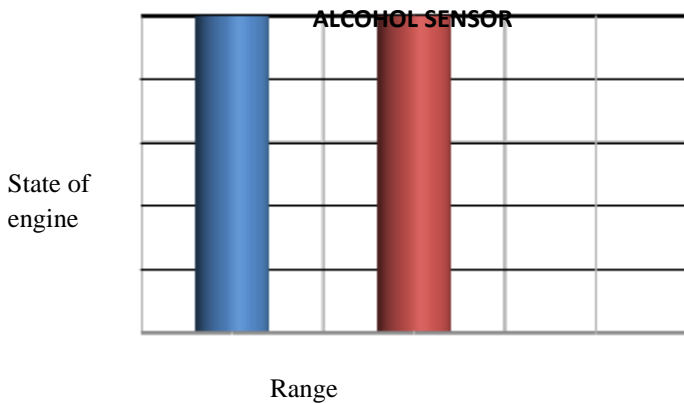


Fig.4.1.

- ✓ 5 - ON
- ✓ 0 - OFF

When value exists from 80 to 120 the engine goes to off state than other values.

TEMPERATURE SENSOR:



Fig.5

To measure temperature of motorcycle there will be a temperature sensor. The temperature meter indicates the temperature of engine body. It also indicates the overheating of the vehicle by announcing frequent beeps.

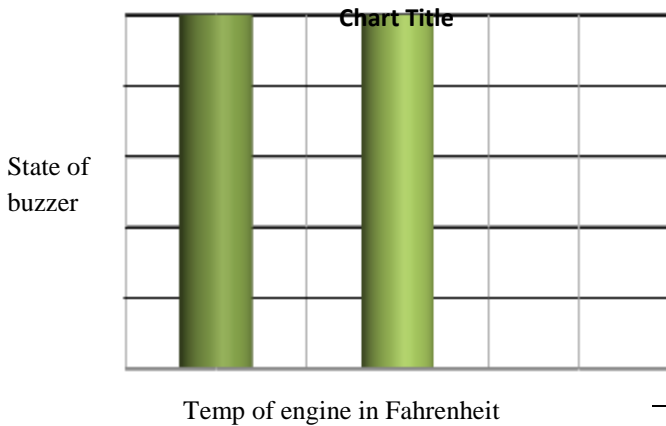


Fig.5.1

GRIP SENSOR:



Fig.6

- Cost effective
- Ultra thin; 0.45mm
- Simple and easy to integrate

GSM:



Fig.7

Like a GSM mobile phone, a GSM modem requires a SIM card from a wireless carrier in order to operate. If accident happened, after collecting all information which is stored in internal memory, μC send this data to base or surveillance unit via SMS using GSM modem.

RESULT

We continuously scan for various parameters of motorcycle, such as engine temperature, speed, and alcohol sensors. The μC stores all this data in the internal memory. If the driver is found to have alcohol in the breath, it warns and then turns the ignition off (if μC is set with threshold values is set. Also applicable to other sensors too) and hence possibility of accident is avoided.

If accident happened after collecting all information which is stored in internal memory, μC send this data to base or surveillance unit via SMS using GSM modem. On the base side we receive the data such as engine temperature, speed, alcohol level etc.



Fig 8. System Developed

CONCLUSION

Traffic accidents keep with a yearly increasing of a high rate. This paper shows the new fatigue detection techniques using alcohol, temperature, speed sensors etc., We can also propose an intelligent motorcycle system for accident prevention using ABS and GPS module and making the world a much better and safe place to live.

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