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Accident Prevention System Using IOT

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ABSTRACT: In many cases, drivers who are drowsy make no effort to apply a brake or avoid an accident. So, a system is designed that senses the condition of the driver (his/her health) and stops the vehicle immediately if an abnormal condition of the driver is sensed to avoid accidents. Truck drivers, company car drivers, and shift workers are the mass at threat of falling asleep while driving. The majority of the accidents occur due to the drunkenness of the driver. In this system, an eye blink sensor, and an alcohol sensor are interfaced to an Arduino. If any of these sensors sense an unusual condition of the driver, the vehicle automatically slows down and stops. A buzzer is set in the vehicle that alerts the nearby vehicles or the passengers inside the vehicle. Simultaneously, an SMS alert consisting of the location and circumstances of the driver is sent to the registered mobile number.

KEYWORDS: GSM, GPS, DC Motors, Alcohol Sensor, Eyeblink sensor, Node MCU

I. INTRODUCTION

The high demand for automobiles has also increased traffic hazards and road accidents. Life of the people is at high risk. This is because of the lack of the best emergency facilities available in our country. An automatic alarm device [1] for vehicle accidents is introduced in this paper. This design is a system that can detect accidents [2][3] in significantly less time and sends the basic information to the first aid center within a few seconds covering geographical coordinates, the time and angle in which a vehicle accident had occurred. This alert message is sent to the rescue team in a short time, which will help in saving valuable lives. When the accident occurs the alert message is sent automatically to the rescue team and to the police station. The message is sent through the GSM module and the location of the accident is detected with the help of the GPS module. This application provides the optimum solution to poor emergency facilities provided to the roads accidents in the most feasible way. The usage of automobiles has improved linearly over the past decade, which increased the risk of human life. This is because due to the insufficient emergency facilities. In this paper, we are using an alarm system that helps in improving the emergency system of the accident system. This system detects the accident occurrence and the co-ordinated of the accident is messaged to the rescue team. A switching system is used to switch off in case there is no causality. This Application helps in providing feasible solutions to poor emergency facilities.

These accidents are common at late night and early in the morning. This is the body's natural sleep period. Accidents due to drowsy drivers most often occur at high speeds on highways and other major roadways. Most of the time, in this case, at least one vehicle may change its direction instantly which may lead to an accident situation. Heartbeat, respiration rate & the body state of the driver are the most important factors to be considered for safe driving. This system look for to reduce the number of accidents caused by crapulous driving, which is a veritably essential element for a prosperous life hereafter. It cautions the motorist and the surroundings with which we can save numerous lives. In this design, we use detectors to measure all these factors. If the values measured don't match with the reference values also the microcontroller will shoot a warning sign to the TV display thereby precluding accidents. The main idea of our design is to reduce the accident rate among truck motorists.

1.1 FATIGUE STATISTICS

Ideally, every individual wants between seven and eighthours of excellent quality sleep every night. At worst, drivers withsleep debt risk unerect off, however fatigue will impair reactiontime and higher cognitive process once behind the wheel thatincreases the chance of being concerned in Associate in Nursing accident. If adriver falls asleep for simply



four seconds whereas traveling at a speed of a hundred km/h the vehicle can have gone 111 meters without a driver's fault. Those teams of drivers considered at greatest risk of being concerned in a very fatigue-related accident are:

1. serious vehicle drivers
2. Drivers with sleep disorders
3. Young Drivers.

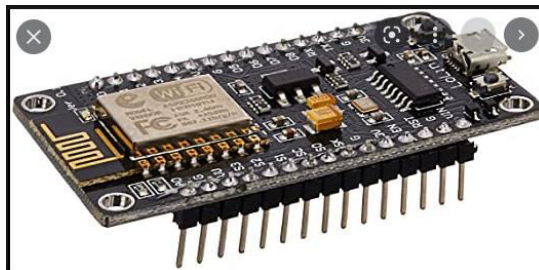
II. BASIC MODEL OF THE SYSTEM:

The diagram of the system consists of:

- 1) Microcontroller(Node MCU).
- 2) IR Sensor.
- 3) Buzzer (Piezo).
- 4) Alcohol sensor.
- 5) Digital display.
- 6) Dc motor.

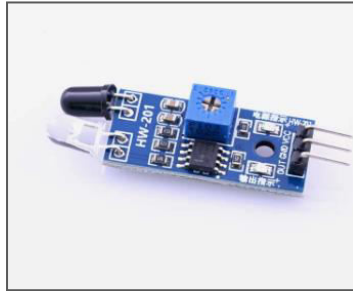
2.1 Microcontroller Section:

Here microcontroller section is that the management unit of the project. It consists of a Microcontroller with its connected circuitry like Crystal with capacitors, Pull up resistors, and reset electronic equipment so on. The guts of the project is that the microcontroller as a result of it controls the interfaced devices. By mistreatment written program it communicates with the devices. Here 16-bit/32 bit ARM7TDMI-S controller with atiny low leadless quad flat package. It supports up to 40KB RAM and 512KB on chip flash read-only storage and supports crystal frequency of 60MHz used high speed operation.



2.2 Ir Sensor:

To identify the sleepiness, physiological reaction sensing element is employed, which is IR primarily based. IR sensing element consists of infrared transmitter and receiver. Infrared transmitter emits infrared rays. The transmitted IR rays square measure received by IR receiver . The IR transmitter and IR receiver square measure organized in parallel. once the signal is given, the IR sensing element starts functioning and IR transmitter emits the infrared rays to the receiver. The comparator is let alone IR receiver. The operational electronic equipment is hooked up to comparator. To the inverting input terminal of the comparator the reference voltage is given, the comparator is joined to receiver. When there is a pause is gift within the IR rays between sender (transmitter) and recipient (receiver), the IR receiver won't conduct. therefore the voltage at the inverting input terminal is lower than the voltage at the non inverting input. Therefore the output of comparator is high. The output voltage of comparator is given to microcontroller. once IR receiver receives the rays from transmitter, the IR receiver becomes conducting since the voltage at the non inverting terminal is lower than voltage at the inverting terminal. Therefore output of comparator is low. therefore the output of comparator is set to controller. This circuit is employed for count protective fold movement.



2.3 Buzzer Section:

To alert or indicate the completion of method, buzzer is used. Buzzer is used to signify the beginning of the embedded system by alerting.

2.4 Alcohol Sensor:

This MQ9 sensor detects ethanol in the air. When a drunk person breathes near the sensor it detects the ethanol in his breathe and provides an output based on alcohol concentration. It is a metal oxide semiconductor (MOS) type sensor. It is based on MQ series.

2.5 Digital display Section:

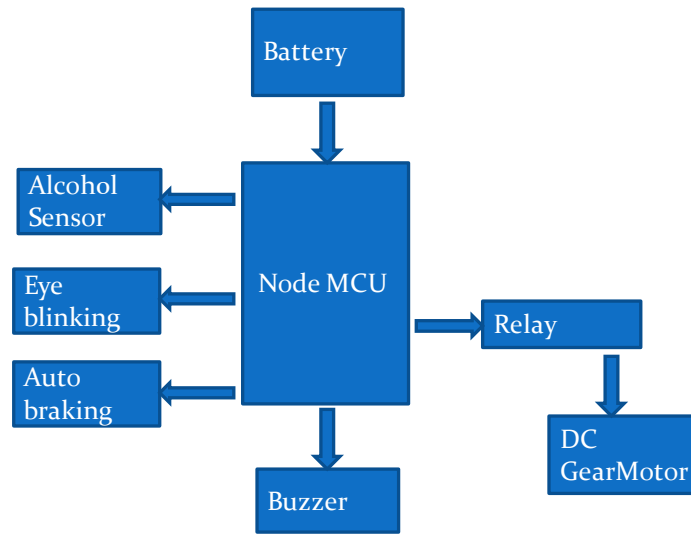
This digital display section is employed parenthetically the standing of the event. The liquid show (LCD) is employed to show or prompt for necessary data.

2.6 Dc Motor:

A motor consists of a permanent magnetic flux stator coil and a rotor. By mistreatment magnetic attraction windings or permanent magnets, the magnetic flux is maintained. For variable speed similarly as for force, DC motors are used.

III. FUNCTION

The project involves preventing accidents because of drowsiness in vehicles by victimization unconditioned reflex detector. The IR transmitter transmits infrared rays into the eyes. The ray reflected from the attention is picked up by the receiver that is in a line to the transmitter. betting on the output of receiver, we tend to get to grasp whether or not the attention is in Associate in Nursing open or closed position. Another further feature is that the alarm system. There are 2 alarms. One within the vehicle to alert the motive force and another outside to alert the individuals in the neck of the woods of the vehicle. If the attention is in a very closed position, then the output is high. This output activates the corresponding pin within the microcontroller Associate in Nursingd generates an alarm. The alarm continues to ring till the motive force takes necessary steps to require management of the vehicle. If after a stipulated quantity of your time, the motive force is unable to require control of the vehicle, then the microcontroller that is linked to the braking system, slows down the vehicle. An external alarm cracks indicating individuals to assist the motive force within the vehicle.



IV. APPLICATION

- I. The main purpose is to provide safety measures.
- II. It can be cast-off in wireless technology.
- III. The eye blink module of the project can be separately used for RFID detection in global industries.
- IV. It can be used in image processing applications by replacing the sensor with the camera module.

V. ADVANTAGES

- I. Intelligent and Safe Transportation.
- II. Accidents due to drowsiness can be stopped.
- III. Drunken driving is also prevented by using alcohol detector.
- IV. Safe parking with no damage to nearer vehicles.

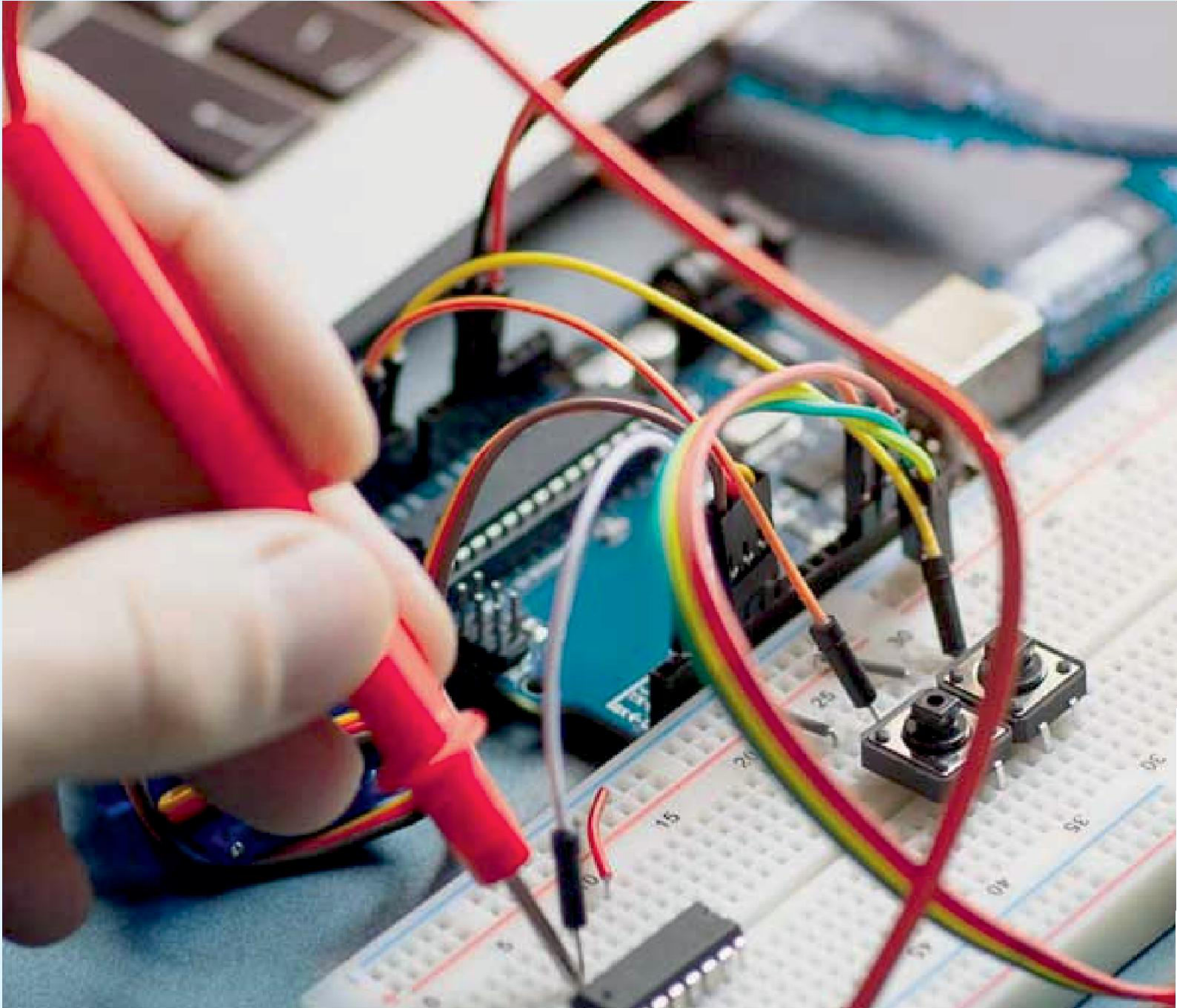
VI. CONCLUSIONS

Nowadays, people have become more open to accidents. So, we as an engineer needs to take some steps against this and provide the desired solution. For the safety of human beings, some automation is made. The purpose of such a model is to promote a system to detect fatigue symptoms in drivers and control the pace of vehicles to avoid accidents. Advanced technology offers some hope to avoid these up to some extent. This project involves measure and control eye blink using an IR sensor. We can automatically park the vehicle by initially using Automatic the braking system, which will slow down the vehicle and at the same time will turn on the parking lights of the vehicle and will find the parking space and will automatically park the vehicle[4][5] preventing the accident.



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