

## **AN ANTI-DROWSINESS ALARM-VIBRATION ARRANGEMENT ON THE STEERING OF A HMV**

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**Abstract**—*Human lost their life abruptly in the accidents, in which road accidents they strayed life, property and some of were injured, they suffer with that injury for their whole life. Driver Fatigue is one of the most common reasons for fatal road accidents around the world. Fatigue is a general term commonly used to describe the experience of being “sleepy,” “tired,” “drowsy,” or “exhausted.” Accidents caused by drowsy drivers tend to result in serious damage as they are unable to hit the brakes or turn the steering wheel in time to avoid a dangerous situation. Where a driver of a heavy vehicle is often exposed to hours of monotonous driving which causes fatigue without frequent rest period.*

*Aiming to prevent this type of dangerous driving in this project we are using ignition key, when the person starts the vehicle by using the key, the jammer automatically turns into on condition. And also we are using a touch sensor which is connected to steering because when the person gets into sleep or driver is unconditional to steer, automatically the sensor gets activated then it gives the signal to the vibrator and 60db siren by using Atmel 89S52 microcontroller. LCD display which is connected to the microcontroller is used to display the status of the vehicle.*

**Keywords**—*safety and secure driving, driver fatigue, drowsiness alert, steering, microcontroller.*

### **I. INTRODUCTION**

A major problem in twentieth century various kinds of vehicles have been introduced to provide convenience in human daily life and due to the developments of new technologies it makes the vehicle running fast and accelerating easily. On the contrary brings in some problems such as the happenings of accidents due to driver's fatigue after a long journey of travel. This fatigue of vehicle driver is tends to drowsiness and sleepiness while driving vehicle. The problem is well defined that there is concern to make off the unconditional driving conditions. Vehicle Road Accidents are reason for decline of human life and minor loss of mechanical engineer work energy and others stern in implementing the vehicle model this will cost of lot of expenses and time of working. This minor loss is leads to improve the safety of vehicles to implement the advanced technologies and one of those ideology in turns in to a safety and security to vehicle driving to minimize the road accidents. Research shows that driver fatigue and drowsiness is one of the major reasons for the increasing accidents. Driver fatigue not only impacts the alertness and response time of the driver but it also enhances the chances of being involved in car accidents. The sleepy drivers fail to take right actions prior to a collision. An important irony in driver's fatigue is that the driver may be too drained to comprehend his own level of drowsiness. This significant problem is often ignored by the driver. Consequently, the use of supporting systems that examine a driver's level of vigilance is necessary to avoid road accidents. These systems should then alert the driver in the case of sleepiness or inattention. Some warning signs that can be measured as indications of driver fatigue are: daydreaming while on the road, driving over the Centre line, yawning, feeling impatient, feeling stiff, heavy eyes and reacting slowly.

### **II. LITERATURE REVIEW**

In 2013, Gastaldi, M., Rossi et. al. [3] described ‘Visual Analysis of Eye State and HeadPose for Driver Alertness Monitoring’. They presented visual analysis of eye state and head pose (HP) for continuous monitoring of alertness of a vehicle driver. The proposed scheme uses visual features such as eye index (EI), pupil activity (PA), and HP to extract critical information on non-alertness of a vehicle driver. A support vector machine (SVM) classifies a sequence of video segments into alert or non-alert driving events. Experimental results show that the proposed scheme offers high classification accuracy with acceptably low errors and false alarms for people of various ethnicity and gender in real road driving conditions.

From a study conducted by Mercedes Benz[7] it reports that if it can get an extra 0.5 seconds in the warning period it will avoid 60% of the overrun accidents and it will reach 90% if 1.5 [8]seconds is added into the warning

period. We introduce in the following some safety warning systems that are currently available in the market and they are technically matured.

The reduction of performance of a muscle after due to stress is called physical fatigue. It is characterized by reducing the power of muscle and their movement. The impaired muscular fatigue increased the chance of accidents ([4]Grandjean, 1988). The driver must take the rest before driving. The rest before the driving reduced the physical fatigue. The hard physical work before driving can be increasing the risk of accidents among drivers and experiencing the physical fatigue during the driving ([5]Strand and Rodahl, 1986). Most of the cargo drivers involved such a type of risk before performing the work. There is another study conducted on physical fatigue of seat interface pressure among drivers ([1] Balasubramanian and Jagannath, 2014). The chemical tankers' drivers tend to be stressed by a prolonged journey as traveled long distance in chemicals supplies process. The psychological factors need to be investigated as a way of mitigating fatigue.

### III.EXPERIMENTAL SET-UP

Ensure that all the connections are properly fixed in circuit. A regular power supply is given to the circuit as 220 V 50HZ which is not permissible to the operating conditions of the circuit so, there is a need to regulate the power supply as per the requirement. To accomplish this a step-down transformer is used in the system is done by the increase in the primary windings on the iron core. The number of primary windings are greater than the secondary windings to step-down the voltage. Output of the transformer s given to the bridge rectifier. It is a device an alternating current AC to direct current DC converter that rectifies mains AC to DC output. This output is given to the filter circuit in which the regulated voltage will be converted from low frequency signals to the high frequency response signals to the microcontroller which is the responsive signals. These responsive signals are supplied to the voltage regulator, it will regulates the supplied domestic voltage to 5V to the all sections in the circuit sections a detailed block diagram as shown in fig 3. The pre-set magnitude of voltage is done by the regulator, entire system is working on 5V, 500mA power supply. The experimental setup is shown in following fig 1.

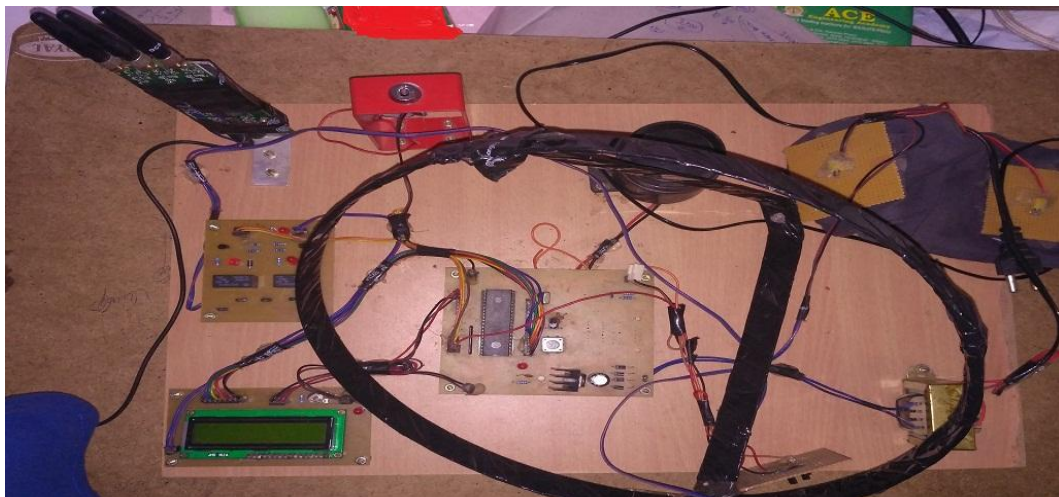


Fig 1: Experimental setup

### III. WORKING OF A PROTOTYPE

Fig 2 shows The safe and security driving system is started with the help of ignition key by switching on the key power supply is given to the system shown in fig2. A touch sensor is installed on the steering right hand gripping side, vehicle engine is started by holding the steering properly i.e., touch sensor otherwise the engine won't start, Because of relay switch is connected with the key of the engine a LCD screen is used to display the status of the engine working.

Jammer is installed in the circuit is automatically started with turn on the engine so, no tele-communications to the driver the range jamming the signal is limited when it is in the working model on the vehicle. The drowsiness of the driver is detected by the handling of the vehicle steering on different situations improper steering of vehicle is meant for drowsiness of the driver and to accidents prone. Drowsiness of the driver is increase's he is unable to steer the vehicle and a contact between the hands to steering will be less, the touch sensor is detects the physical signals form the steering by driver and sends the required signals to the microcontroller in the circuit. A programed is embedded on the microcontroller to give the alert by siren and vibration. System consists of a 60 disable buzzer sound and a simple vibrations which are preset to awake the driver and this indications of alert is imposes the driver condition on driving and the safety and security level of driving. All sections in system circuit are in working condition as shown in the following figure4.

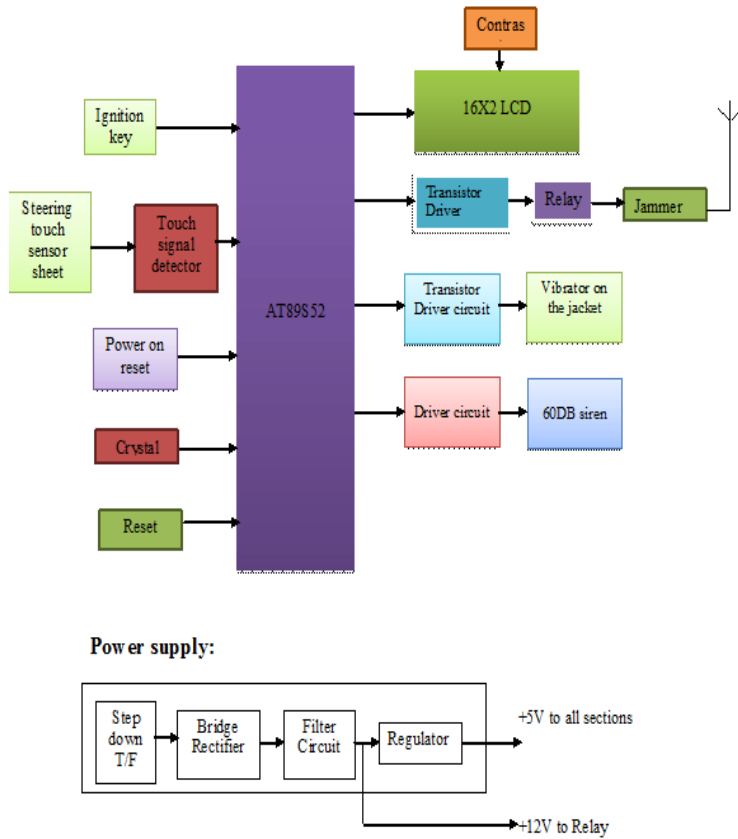


Fig3:Block Diagram Of Working Of Prototype



Fig2:Led Indication Of Power Supply



Fig 4: working of prototype

#### IV.EXPERIMENTAL RESULTS

The initial setup of system is started with the proper holding of steering before starting engine, which is indicated in the LCD screen as shown in fig5.

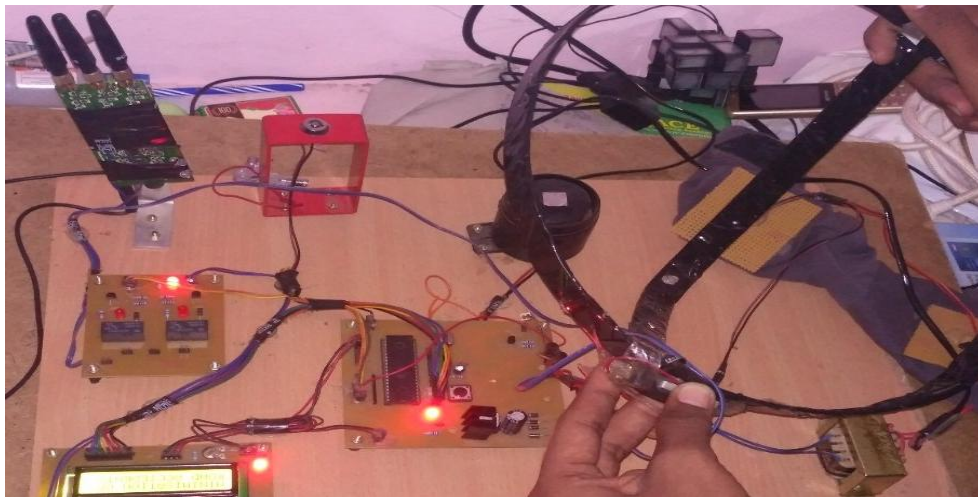


Fig 5(a): Starting of system



Fig 5(b): Vehicle starting indication on LCD screen

Jammer is turn on automatically by switching the ignition key and the same is displayed in the LCD screen, which will breaks the tele communication of driver for safe and secure driving. The result of jammer as shown in the fig 6.



Fig6: Result of jammer

When the vehicle driver is in drowsy condition, he is unable to steer the vehicle properly i.e., physical contact between the steering and driver hands were not maintained appropriately so this will be sense by the touch sensor on steering. Three LED lights will illuminated as shown in fig 7 and the status of alert will be displayed in the LCD screen as shown in fig5.4.



Fig 7: Indication LED lights



Fig 8: Status of driver drowsiness alert

Once the alert gets activated, 60 decibel buzzer will give buzzer sound as alert indication and vibration belt will get activated. This buzzer sound and the vibration effect of the vibration belt together makes the driver to get into the normal condition.

#### Limitations

- The proposed system is works by starting the ignition key without that key power wont supplied to circuit.
- Driver can't make tele communication while driving.
- Driver is not able to make tele communication in emergency situation. If he want to make a call he is to stop the vehicle.

#### Advantages

- Reliability in operation.
- Ease of Operation is simple and user interface friendly.
- Immediate alert will minimize the accidents.
- Can save human being Lives from road accidents.

#### Application

- Security in driving is increased as concern to driver and passenger.
- Alert system will be used for heavy vehicles for better safe and secure driving.
- A long distance transportation will be free of accidents.

## IV. CONCLUSIONS

In the present work an attempt is made to develop an anti-drowsiness alarm-vibration arrangement on the steering of a HMV to minimize road accidents which is very use full for heavy vehicle driver who are traveling long distance without rest. A mobile jammer will jams the mobile signals while driving to avoid careless driving. In this system a buzzer and vibration alert will responsible for wake the driver from drowsiness to normal condition.

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