

## AUTOMATIC DRIVER HEALTH MONITORING SYSTEM USING GSM

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### ABSTRACT

The drowsiness of the driver has become a major cause for the road accidents. This has become a major challenge to develop a system for the prevention of road accident. Some methods need to be developed to prevent the driver from his drowsiness during driving. The following measures such as vehicle-based measures, behavioural measures and physiological measures used to determine driver drowsiness. The proposed work is to develop a prototype for driver drowsiness detection system. This system mainly focuses on monitoring of the driver's body temperature and eye blink rate. It also monitors the heart beat rate of the driver. These factors are measured using the appropriate sensors. The microcontroller compares the sensor value with reference values provided. It alerts the driver if these values are out of the reference value range. Additionally, the GSM module send the message to concerned people to notify about the driver with location. This method is used to avoid the major accidents that are accruing due to fatigue and drowsy driving of a driver.

**KEYWORDS:** Eye blink sensor, heart beat sensor, temperature sensor, LCD display, GSM module, Arduino.

### I. INTRODUCTION

When a driver is becoming drowsy. The development of technologies for detecting and preventing drowsiness at the wheel is a major challenge in the field of accident avoidance systems. Because of the hazards that drowsiness present on the road, methods need to be developed for counteracting its affects. The focus will be placed on designing a system that will accurately monitor the eye blink rate heart-beat respiration rate and temperature of the driver. In this project we use sensor to measures all the factors. The values measured will be sent to the Arduino where the measured values compared with the reference value. If the values measured do not match with the reference values then the Arduino will send a warning signals in the LCD display and message send to the concerned people thereby preventing the accidents.

### II. EXISTING SYSTEM

The system used by the Skoda cars is also similar to that of the ford cars. The steering movements are being analyzed and are compared with the movements in normal driving ones. It checks the vehicle performance in the initial 15 mins of starting the engine. The driver's fatigue level is displayed when system detects that the driving is abnormal. Heart rate analysis is also used by some systems. Some ideas has also been proposed which uses the change in driver's brain wave to detect the symptom of fatigue. The fatigue detection is not an easy task. It takes into account various factors. There are also some groups which are working on a camera based technique to detect the fatigue level. This system analyses the facial expression of the driver. By detecting the driver's emotion the system will analyze its driver's fatigue level. The eye movements, opening and closing of the eyes and the movements of mouth are being analyzed. Based on the data the driver will be informed about its fatigue level. Many methods are already present that detect the individual facing elements. These methods are based on the vector operations and the pattern classifications. There are some methods which are based on the processing of the image in spatial frequency domain and filtering of image. The mostly used methods are neural networks, analysis of main component, gabor filters. Neural networks are used for classification of the pattern data and are therefore used in face detection and recognition system.

### III. PROPOSED SYSTEM

A camera which is able to capture a video or an image with minimum capturing capability of six mega pixel without blurring is used. Apart from this an alarm system is installed which generates the output through speakers. Categorised series of headings followed below to illustrate the proposed system

- Initialize and setting the camera

- Frames of Video
- Detection of Video
- Detection of Eye
- Verifying the condition for open and closed eyes.

### IV. MODULE DESCRIPTION

#### Power Supply Unit

230Volt, 50Hz, of AC signal from the board of main supply is input to a step down transformer. The selection of the transformer is done in such a way that the output of the transformer is from 10Volt to 12Volt. The main function of this unit is to supply the required voltage which equals to +5V. 5V of regulate supply. The ac voltage is stepped down to initially filtered which is done by a capacitive filter producing usually a DC voltage which has AC voltage variation. This DC input can be used by the regulator circuit to provide a regulated which not has much ac voltage variation. The voltage regulation is obtained by using a number of IC units with proper voltage regulation.

#### Arduino

Arduino is an open-source platform used for building electronics project. Arduino consist of both a physical programmable circuit board(often referred to as microcontroller) and a piece of software, or IDE(Integrated development Environment) that runs on a computer, used to write and upload computer code to the physical board.

#### GSM Module

GSM/GPRS RS232 Modem is made with SIMCOM Make SIM900 Quadband which is from the rhydolabz. The GSM/GPRS engine is compact in size and always is easy for using as a plug GSM modem. It works on frequencies such as 850 Mhz, 1800 Mhz and 1900 Mhz. RS232 level converter circuitry is used for designing the modem which helps to directly interface PC serial port. AT command is used to configure the baud rate from 9600-115200. The modem is initially in auto baud mode. There is an internal PCP/IP stack in the GSM/GPRS RS232 to help us to connect via GPRS to the internet. In M2M interface the data transfer application and SMS both are suitable with the help of this. Three wires are needed by the modem except power supply for interfacing with microcontroller/host PC. A wide range of power supply which is unregulated is connected with the allowance of the low dropout linear voltage regulator which is built in.



Fig-1: GSM Module

### Temperature Sensor

The temperature sensor which is being used is LM35 which is an integrated circuit sensor which is used to measure the temperature with electrical output in degree Celsius. This electrical output is proportional to temperature. When the temperature is low then the fan will switched off and vice versa. This sensor does not need an external calibration and always maintains accuracy of +/- 0.4 degree Celsius.

### Eye Blink Sensor

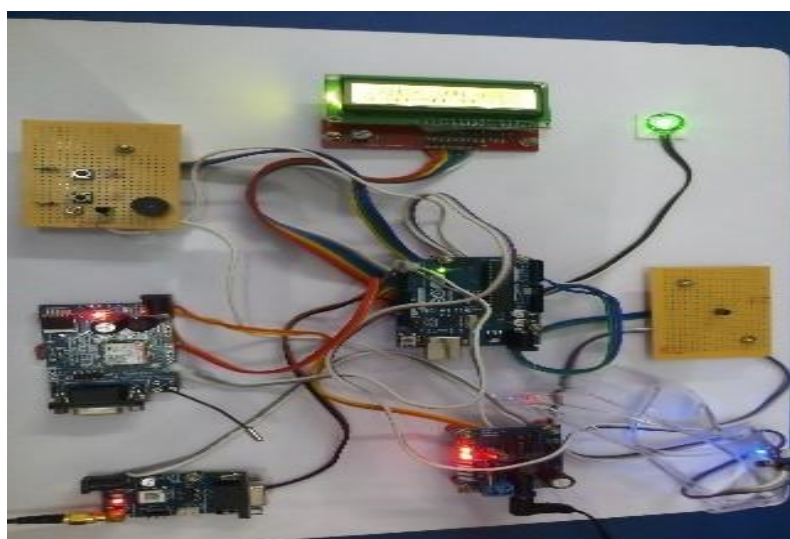
The eye blink sensor performs its task by the illumination of the eye with the infrared light. The changes of the reflected light is monitored with the help of a phototransistor and a differentiator circuit. The aiming as well as the positioning of the emitter and detector affects the functionality.

### Heart Beat Sensor

The heart beat sensor measures the beat of the heart. The beat of our heart can be measured by a process known as optical power variation in which light is absorbed or scattered on its path via blood as the beat of heart changes.

## V. CONCLUSION

This study showed very good results in the application of the surveillance of driver using the technique of artificial vision and its implementation on a smart phone. The system which has been implemented efficiently detects the indicators which appear in drowsiness. The measurements are to be taken under established conditions. These conditions decide the system's correct functioning. An application of artificial vision was only developed because of the development in the processing characteristics of smart phones which can detect the visual and facial indicators of drowsiness in a person. The indicators are head movements, state of the eyes and yawning. This paper presents the analysis and design of the drowsiness detection system. The proposed system can be helpful for avoiding the road accidents caused by the drowsiness of the driver. According to our study we can say that by combining two or more approaches, we can reduce the limitations of the other approach and leading to the best result. This leads to the making of a very efficient driver drowsiness detection system. The image processing approaches can be combined with some vehicular and physiological measures. The main advantage of this paper is that the system is very accurate in physiological measures.



**Fig-2:** Automatic Driver Health Monitoring



Fig-3: Output

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