Hybrid Driver Safety, Vigilance and Security System for Vehicle

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***Abstract*- Mainly accidents occur due to driver's carelessness. The main aim is to provide awareness and safety mechanism for the driver. Main reason of an accident is due to laziness, alcohol consumption and abnormal pulse rate of driving person. In addition to this crime detection, security system and person level identification is determined. In this paper alcohol detection and heart rate control system, person level identification system, eye blink that is laziness level, crime detection and mobile free auto reply method is used to avoid an accident. Password authentication, calls divert method, pulse level and eye blink checking system is processed. Each method is used to rectify the carelessness of the driver and immediate declaration technique is developed by use of GSM technology. Their simulation output is viewed by MATLAB and the hardware module is obtained.**

***Keyword*- MQ3 sensor, IR sensor, Heart rate control system, Passive infrared sensor, Password authentication and auto reply SMS GSM.**

I. INTRODUCTION

Road accidents and collisions occur many times. Every hour, 40 people under the age of 25 die in road accidents. Most of the city accidents are due to sloppiness of driver but outside the city, accidents occur due to drunken driving only. Due to situation accident may occur, that is if there is a less pulse level then person may lead to unconscious stage. more than people is loss due to heart attack, drunken driving only so this can be reduced by using different techniques .Heart rate monitoring system ,Alcohol detection method, Human level identification methods are used to minimize the level of an accident. Away from this due to driver alertness within a fraction of second accident may occur. The accidents occur most of time, if person attends a phone call while driving. To avoid this problem many technique have been used. For Heart rate heartbeats are typically expressed as beats per minute. Sensor is a device that detects changes or events in quantities and provides an output corresponding to the input the signal generally is in optical or electrical signal. Sensors obey certain condition and rules. It is sensitive to the measured property only. It is insensitive to any other property likely in it application. An individual PIR sensor detects changes in the amount of infrared radiation. Their value varies on the temperature and surface characteristics of the objects in front of the sensor. The sensor converts the resulting change in the incoming infrared radiation into a change in the output voltage, and this triggers the detection. For counting the eye blink and detecting the drowsiness level by use of IR sensor. Every year nearly 1.4 million people have been killed because of the wireless customers. There is a highly efficient automatic system for early detection of incoming and outgoing call. Detecting the causes such as alcohol consumption, range pulse level, person and drowsiness level identification, theft detection and security systems are handled in the hybrid driver safety awareness method.

II. HYBRID MEHODS

Generally Hybrid word is used for gathering more number of components in a single system. Likewise there are drowsiness detection pulse level monitoring process are present. Different process combined together to provide an awareness for the driving person. Hybrid driver safety method consist of separate methods. Vigilance method is nothing but drowsiness detection method.

Safety method is based on theft detection system this is identified by use of the password authentication process.

III. ACCIDENT AVOIDANCE SYSTEM

In accident avoidance system: Drunken driver prevention, human level detection and heart rate measurement method is used. These preventive methods are mainly used for avoiding accident. If a driving person consumes any alcohol or drug this made the person to become an unconscious stage due to this accident occurs. Accidents occur due to loss of health conditions or without the knowledge of owner that is due to less oxygen level inside the vehicle is reduced then person die. Three methods namely drunken driver prevention, human level In accident avoidance system: human level detection, drunken driven prevention and heart rate measurement method is used. These protective methods are mainly used for avoiding accident. If a driving person consumes any alcohol or drug this made the person to become an unaware stage due to this accident occurs. Accidents occur due to loss of health conditions or without the information of owner that is due to less oxygen level inside the vehicle is reduced then person die. Three methods namely drunken driver prevention, human detection and heart rate measurement methods are used. These three methods are mainly used to avoid the accident.

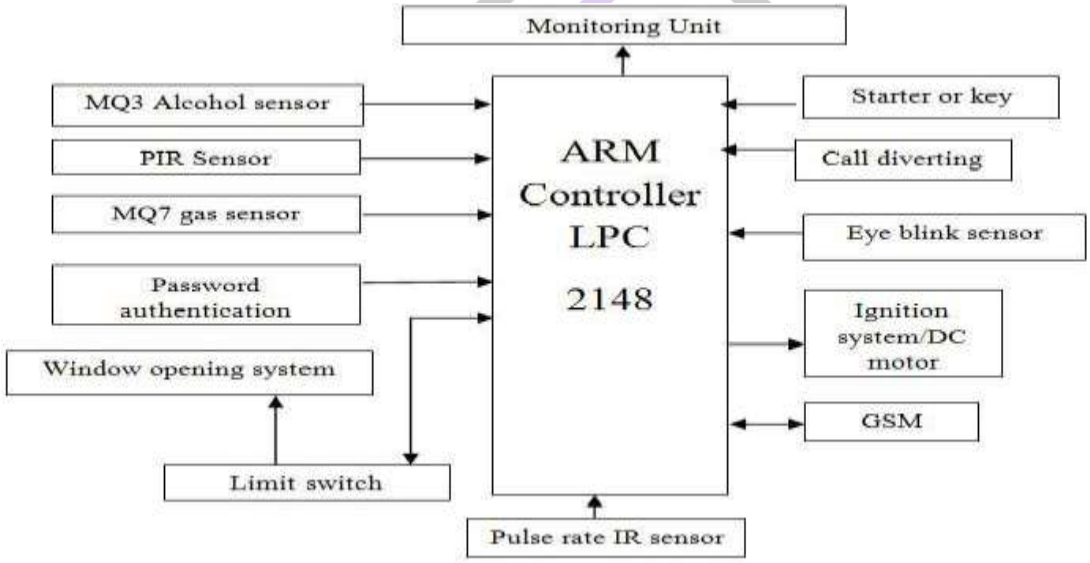

Fig 1: Hybrid Safety and Security system for vehicles

The Figure 1. Shows Hybrid safety and security system for vehicle uses different sensors such as alcohol sensor, MQ7 gas sensor, and passive infrared sensor. These methods are mainly used to sense the signal and these signals are controlled by the controller. The ARM controller LPC 2148 is programmed based on human level detection, alcohol condition and pulse rate monitoring. In addition there are three method driver vigilance level is detected and if the person is in abnormal condition then for driver side alarm is ON then for the theft detection method theft is identified by use of the password matching method. For security purpose password method is used. Then accident occurs due to attending phone call to avoid this process by using call diverting technique is used. These varieties of methods are used in the hybrid driver safety and security method. Each signal from the sensor is received by the controller then analyses with the different inputs then output is achieve. Alcohol sensor inform the driver to blow air into the sensor unit and checks the alcohol content present in the driver body. Heart rate sensor is used for measuring the pulse rate. If pulse level is large even in that case if driver drives the vehicle then the system will apply brakes automatically to slow down and stop the vehicle. By use of MQ7 sensor when person is inside carbon-di-oxide level is determined and there is an automatic anti-locking system for door opening process. For eye blink sensor IR sensor is used to sense the signal.

If Eye Blink range is less then automatic indication is given. Theft detection and security system are present in the hybrid model. This hardware module is laced in vehicle side and intimation is passed through use of GSM technology and these outputs are viewed using MATLAB software through interfaced process.

A. Alcohol Detection Method

Alcohol Detection system is used to measure the alcohol content present in our body. If alcohol content is high, then there is a decrement in breathing level, due to this accident may occur. The amount of alcohol in blood is called blood alcohol level. Alcohol level is calculate by use of the gas detecting sensor. There is an MQ3 gas sensor, which is used to find out the alcohol level and their values are pass to controller. If the value is higher than the threshold value then ignition system is not yet started. There is an alcohol testing feature which instructs the driver to hiss air into the sensor unit and then it checks the alcohol content present in the driver breath. If the value has crossed a certain level the vehicle ignition will be locked which prevents a drunken driver from starting the vehicle. Alcohol Detection Method used to sense the alcohol content, in this MQ3 alcohol sensor unit is used to check the breath of a person whether the alcohol drink or not. Here the analog signal is converted to the digital form then the signal is given to the ARM circuit because controller sense only the digital form. The ARM is programmed with certain threshold voltage. The low medium and the high certain level of an alcohol condition are programmed into the ARM circuit, if higher then alarm work at the vehicle side. If the alcohol usage is less, then the condition is verified. If the driver take to eat more alcohol thereby the condition is not satisfied. Therefore power supply insufficient to the controller and the relay switch. Hence the inflammation system is not connected and the DC motor turned to OFF condition. Alarm sound is obtained. Alcohol eat up by the driver is measured and the output graph viewed in MATLAB for different values. From this alcohol uses of driver is checked hence the crash or accident is avoided and for different ranges of input values the output is obtained.

B. Heart Rate Sensor Method

Heart rate sensor method is a simple device that receives a sample of signal in form of pulse rate and calculates the heart beat signal as beats per minute. Normally human heart rate is about 70 beats per minute for adult males and 75 beats for adult females. Generally there are different types of condition for heart rate. If the heart rate signal is of normal conditions is called as bradycardia and if it is in abnormal condition then it is known as tachycardia.

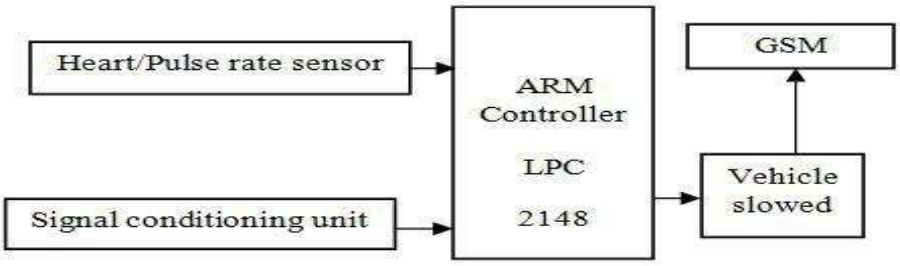

Fig2: Heart Rate SensingMethod

This Figure 2.Heart rate sensing method is used to measure the pulse rate. The normal and abnormal condition of the pulse level organized. If the pulse level is in abnormal condition then the amplified signal is fed to the controller. The controller receives the amplified signal and if abnormal then the pulse rate is high. Then the vehicle slowed and stopped based on the conditioned programmed to the controller. If ignition is started or in ON condition then the pulse rate is calculated for every 20 seconds as programmed to the controller. Normal pulse rate range is of 72

beats per minute. If the calculated value is higher or lower than the threshold value, then it is known as abnormal condition. In this case vehicle is stopped and intimation is sent by use of GSM. If pulse rate is in normal condition then the vehicle is moved without any restriction. Due to this checking process accidents can be reduced. Mainly if the value of pulse rate is abnormal it indicates that the driving person is very serious condition then information is sent to nearby hospital or relatives, this saves the human life. Heart rate sensing method used for the measuring heart rate the first the pulse rate is measured through the sensor based on the input and output signal the variation is determined. If range of the pulse is high then condition is checked if higher than the threshold value then by use of relay switches the vehicle is slowed and stopped, then in an emergency condition information is send to the predefined number through the GSM technology.

C. Human Level Identification Method

In this case if any person inside the vehicle human level identification method is used to identify number of person inside the vehicle and then indication is send to the owner of vehicle. The main use of human level identification method is to analyses the person inside the vehicle. Passive infrared sensor is used this detects the human level. If vehicle is not in use in that case door of the vehicle is in closed condition in such situation if any person is inside the vehicle without the information of the owner then the person inside the vehicle will lose their oxygen level, here the carbon-di-oxide level is high due to this person may die. Then second is the signal output circuit. Passive infrared sensor is a pyroelectric device which is used to sense the person by use of infrared sensor. Relay switch works based on the input signal. If the value of input signal is in not good then switch is opened condition. Limit switch is used to indicate gate is in close or opened. If there is a person inside in this cased limit switch is used to open the window.

Fig3: Human Level Identification Method

There are two ways of Detection methods. One way is Eye blink sensor method, next is theft detection process. These two methods are used to avoid accident and protect the human life. A.EYE Blink sensor Driver fatigue resulting from sleep deprivation or sloppiness is an important factor in the increasing number of accidents on today's roads. Most of the accident occurs due to laziness. This laziness level is detected by use of eye blink sensor. IR sensor is used detect the blink of an eye. In this case IR transmitter is used to transmit the infrared rays in eye. The IR receiver is used to receive the reflected infrared rays of the eye. If the eye is closed means the output of IR receiver is high otherwise the IR receiver output is low. This to realize the eye is closing or opening position. The signal is given to IR transmitter whenever the signal is high, theIR transmitter LED is conducting it passes the IR rays to the receiver. The IR receiver is connected with comparator which is constructed with LM358 operational amplifier.

B.Theft detection system

The vehicle anti-theft system consists of different steps such as password detection and the matching process .Theft occurs when the doors are opened. Once the vehicle is turned ON then with the mechanical keys along with correct key number door is opened. Vehicles theft is identified by use of the password

method. If the password is matched then only the vehicle is started and then indication is send to the owner of the vehicle. Keypad switch is used for authentication process. If Password matched - indication is send to owner, ignition is started. The password is pass to the ARM controller from the keypad switch the password is given. If the password is matched then There is an inverting and non-inverting input terminal in which based on the reference signal and input signal the output is obtained. In figure 4. Eye blink detection sensor is used to realize the blink of person while driving and their range is compared. The compared output is given to the ARM controller and if their value is greater than the threshold value. If the value is high then alarm sound is produced. Counting of an eye blink is calculated. For every 20sec eye blink is counted and if the count of eye blink is less than the threshold value then alarm sound is produced and immediately intimation is send to owner of the vehicle. For each power supply is given and their outputs are viewed in module. The intimation is send to the owner hence the vehicle is started. If password is not matched then vehicle is not started then intimation is send to the owner. Thus theft of the vehicle is analyze and hence security system is provided.

IV. CONCLUSION

The given work is used to avoid the accident by use of heart rate monitoring system, person level identification method and Alcohol detection in addition to this three method there is detection method such as eye blink sensor, theft detection, security system is used. MATLAB simulation is obtained by giving different input to the process. Mobile hand held system and face detection techniques can be used for future application.

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