OLED Display For Real Time Vision System

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Abstract: This innovative glass design will carry an OLED based display controlled via nano Ardiuno board having Bluetooth connectivity with a Smartphone to exchange information along with onboard accelerometer. We are using a tilt angle sensor for detecting if the driver is feeling drowsy. An alcohol sensor has been used to promote the safe driving habit. The glasses will be getting latest updates about the current speed of the vehicle, navigation directions, nearby or approaching sign broads or services like petrol pumps. It'll also display information like incoming calls or received messages. All this information will be obtained through a Smartphone connected via Bluetooth. Also the car mileage can be monitored with help of fuel sensor as the consumption of fuel is directly related to it. Abnormalities if detected will be immediately notified in the glasses. Also the angle of the tilt angle sensor can be defined and set by the user according to his needs. Also the main idea of using OLED glasses is that it is organic thereby helps in reducing the carbon footprint and is quite slim. Therefore it can be easily mounted on the specs without making it heavy. Also they higher level of flexibility and have low power drain and energy consumption

Index Terms: OLED, Arduino, Sensors, Bluetooth, Android, LCD display, Buzzer

1 INTRODUCTION

In today's world automobile technology is increasing by leaps and bounds, which is increasing the performance and speed of vehicle as well. Speed and other driving parameters puts a lot of pressure on the driver while driving at high speed where a single mistake can cause a serious accidents. Using the same latest technology, OLED based advanced display glasses can be used for the driver, which will help him to concentrate on driving the vehicle. It will bring all the required important information right in front of his eyes, so that he will not be distracted as well as he can make an informed decision about driving the vehicle safely especially at a high speed. This innovative glass design will carry an OLED based display controlled via nano Arduino board having Bluetooth connectivity with a Smartphone to exchange information along with onboard accelerometer. In this project tilt sensor is used to prevent drowsiness. An alcohol sensor has been used to promote the safe driving habit. The glasses will be getting latest updates about the current speed of the vehicle, navigation directions, nearby or approaching sign broads or services like petrol pumps. It will also display information like incoming calls or received messages. All this information will be obtained through a Smartphone connected via Bluetooth. Also the main idea of using OLED glasses is that it is organic thereby helps in reducing the carbon footprint and is quite slim. Therefore it can be easily mounted on the specs without making it heavy. Also they higher level of flexibility and have low power drain and energy consumption.

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Though accidental deaths cover all types of unnatural deaths like those caused by building collapse, drowning, explosions, industrial mishaps, etc, road accidents account for the maximum number of such fatalities. Mumbai was No. 4 in road accident cases in the four years were analyzed. Across the country, over 35% accidents take place on roads every year. In fact, road mishaps are the reason for around 92.6% injuries and 37.3% fatalities suffered in accidents. According to the research, with the number of road accidents increasing every year, the death toll too has been on the upswing. The statistics of car accidents [9] is depicted below in the table:-

CITIES	CAR ACCIDENTS
Chennai	9145
Delhi	7432
Bangalore	5904
Mumbai	3455

Table 1- *Statistics of Car Accidents*

2 OBJECTIVES

1. To design the circuit that can improve the safety of the drivers.
2. To design an effective navigation tool.
3. To minimize accidents if not completely avoid them.

3 BLOCK DIAGRAM

1) TRANSMITTER BLOCK

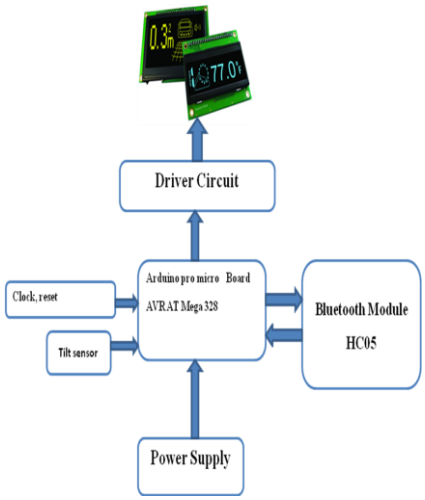


Fig 1.1*Transmitter Block Diagram*

The OLED display is controlled by the driver circuit which mainly consists of arduino board installed with an ATMEGA328 microcontroller. The microcontroller receives information via the Bluetooth module. The board is provided with power supply, clock, reset and tilt sensor wherein tilt sensor is used to keep the driver alert if and when he feels drowsy or dizzy by means of a buzzer installed within it.

2) RECEIVER BLOCK

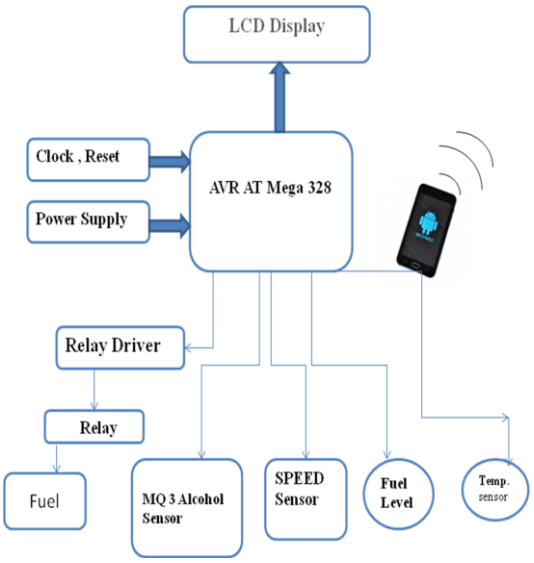
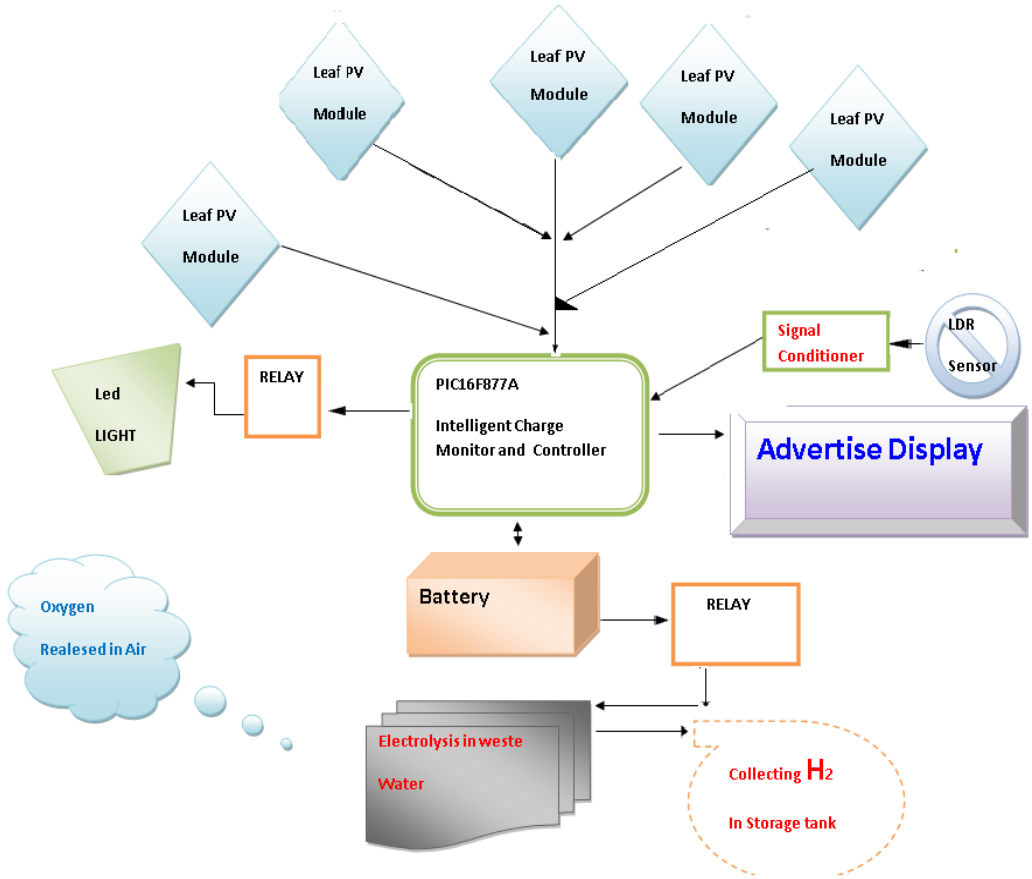


Fig 1.2 *Receiver Block Diagram*

The received information is displayed on the LCD display from the microcontroller. The microcontroller is provided with clock, reset and power supply. All the messages, calls received on the Smartphone are displayed on the glasses with the help of Bluetooth module. The microcontroller is connected with a fuel sensor, MQ3 alcohol sensor, speed sensor and a temperature sensor. The fuel sensor indirectly controls the mileage of the car by keeping a constant track of the fuel tank. The alcohol sensor helps in preventing accidents due to drunk driving by keeping the driver alert with the help of an alarm system. The speed sensor and temperature sensor keeps a constant watch on the engine and prevents accidents.



4 METHODLOGY

In this project nano arduino board is used. The main requirement is the controller, as the information is displayed on the screen with the help of the controller. The mode of communication between the phone and the display is done by the Bluetooth module .A supply of VCC of 5 volts is given and is connected to the ground. There is a built in strip line antenna which consists of RX and TX. To display information of the dash board on the screen we use RF communication. There is a tilt sensor, which consists of a mercury ball which is connected to the ground is ON, the transistors are activated which gives a signal in the form of buffer. This makes the driver alert and conscious. For Bluetooth communication we require an android phone. Also GPS service is used for location. Suppose the driver gets a call or a message on the phone, the information is displayed on the screen with the help of a Bluetooth module HC05. The message or call is received with the help of GSM at normal condition i.e. it is kept at horizontal position. If the person is feeling sleepy or dizzy, with the driver's movement, suppose his head is tilted downwards, the ball also tilts at a predefined angle the circuit. In the dash board we have speedometer, tachometer, fuel and petrol level indication, engine oil level, temperature sensors etc. will be displayed in LCD under normal conditions. Temperature sensors consists of thermistors whose voltage changes with respect to change in temperature which could damage the engine or while driving, the accelerometer is used frequently, it causes a huge consumption of fuel or if the speed of the vehicle is exceeded beyond a certain limit, instead of displaying the information it would be displayed on the OLED as a warning. Also an alcohol sensor MQ6 is located on the steering wheel. It has heater and sensor plates whose output is given to the controller. The breath of the driver are in the form of gas which is attracted by the heating plates of the sensor, converts them into ions and passes them to the sensing plates, which is connected to the load resistance that is connected across it senses the voltage developed across it and we can sense the voltage, this output would trigger the controller and the information would be displayed on the screen. To transmit all the information we require an RF transmitter and to display the information we require RF receiver. Software required is Arduino 1.5.8 for controlling the sensors and for OLED Display. Also B4A i.e. Basics For Android is used for calls and messages.

COMPARISON WITH SIMILAR PROJECTS

'A Smart Helmet using GSM'. The idea of this work is to give information about the rider wearing the helmet or not, whether the rider drunken or not and also, he met with an accident it gives an information about location where he is met with an accident through GSM module to mobile numbers family members, so I have chosen GSM technology to give the information by sending SMS, using GSM module which has SIM card slot to place the SIM and send SMS. Sending SMS alone can't help the driver, if we send and an SMS saying that accident had occurred where the ambulance will come without knowing the location of the accident. So to trace out the location where exactly accident occur using GPS module, and gives to microcontroller, then it sends the SMS which contains the latitude and longitude of a area to family members mobile numbers For this we use GPS module to extract the location of the accident, the GPS data will contain the latitude and longitude values using which we can trace the accurate position.

5 ACKNOWLEDGMENTS

This work was supported in part by the Department of Electronics and Telecommunications, SIES Graduate School of Technology. Also supported by the head of the EXTC department Dr. Atul Kemkar and project guide Prof. Senthilkumar D

6 CONCLUSION

This system is very effective for the safety purpose of the user. User has to wear the specs and all the information would be displayed on the screen. This system is under pocket control i.e. Drive the car having safety in hand and in budget also. Easy functioning to operate this system. It provides a better security to the driver.OLED technology may usher in a new era of large-area, transparent, flexible and low-energy display and lighting products. The flexibility of OLEDs enables manufacturers to produce OLEDs using roll-to-roll manufacturing processes, and allows for the production of flexible display and lighting products. OLEDs are commercially produced on rigid glass substrates mainly. However, first applications like watches or bent displays using flexible OLEDs have entered the market lately. Developing sufficiently durable and flexible OLEDs will require better materials and further development of manufacturing tools and processes. Flexible plastic substrates need improved barrier layers to protect OLEDs from moisture and oxygen. Thin-film encapsulation also is needed to create thin and flexible metal- and glass-based OLEDs. These advances ultimately may lead to very flexible OLED panels for both display and lighting products, ensuring that any surface area – flat or curved – will be able to host a light source. Recent demonstrations by display and lighting companies already have hinted at the potential of flexible OLED technology. Substantial development efforts are being invested in this area and, if successful, flexible OLED panels may become commercially available as early as the last half of this decade.

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