Investigation of Embedded System using different sensors in Automobile Sectors

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***Abstract*—This paper centers around the present need to chip away at the mishaps occurring each moment which causes the demise of a few people far and wide. The International Labor Organization has assessed that around 2.3 million individuals die because of street mishap occurring each year everywhere throughout the world. The quantity of mishaps are expanding step by step. This paper proposes another technique so as to take early reaction and safeguard of mishap unfortunate casualty to spare their life. This paper tends to the utilization of specific sensors which are having ability to recognize the mishap spot and send the warning to the unfortunate casualty's relative.**

Keywords – Sensors, Arduino, Microcontroller, GSM, GPS, MQ-3.

I. INTRODUCTION

An embedded system is a sort of system which can be modified and controlled with a gave capacity inside a greater mechanical or electrical framework. It goes about as an interface among equipment and programming segments. In current timeframe ninety eight percent of all microchips are made as parts of installed frameworks. It is a framework which depends on a microchip or microcontroller and is intended to play out a required errand. Arduino is an exceptionally little piece of installed framework or at the end of the day it's only an utilization of implanted framework. Arduino is a microcontroller board with an explicitly planned API and programming which make programming it exceptionally simple. Arduino is a little drop of water in an Embedded System sea. In this paper the use of Arduino has been utilized to design different electronic sensors which depend on the programming of Arduino. A portion of the sensors like GSM [Global System for Mobile] Sensor, GPS [Global Positioning System] module, Accelerometer, Smoke Sensor, Alcohol Sensor Breathalyzer, Humidity and Temperature Sensor and so on are utilized. These sensors are altogether customized and arranged with Arduino and we can avert mishap and can take measure if mishap occurs with the assistance of these electronic sensor.

II. LITERATURE REVIEW

Street mishaps are an intense issue over everywhere throughout the world. Almost about 1.3 million individuals kick the bucket in street mishap consistently. When 1962, a WHO result examined the nature and enthusiastic of the issue [1]. In 1974, the World Health Assembly procured Resolution WHA27.59, broadcasting street traffic mishaps a vast general medical problem and calling for Member States to stamp the issue [2]. In the beginning of year 2003, the United Nations embraced a Resolution [A/RES/57/309] on the overall street security emergency [4], included by a report of the Secretary-General on the comparable subject to the 58th gathering of the United Nations General Assembly forthcoming around the same time [5].In November 2003, further a Resolution [A/RES/58/9] was continue by the United Nations, encouraging for a genuine meeting of the United Nations General Assembly on 14 April 2004. The rationale of the plenary(complete) meeting was to expand the consciousness of the recurrence of the street mishaps issue, and to speak about the execution of the World outcome on street damage avoidance because of traffic at the United Nations General Assembly [6].Without the expansion in endeavors and new activities to avert street mishaps, the whole number of street traffic passing around the globe and the wounds is anticipated to ascend by total 65% continuously 2000 and 2020 [7,8], and in creating nations, the passing because of street mishaps are plan to climb by roughly by 80%. Consistently, around the world, about 16000 individuals got passed on because of mishap wounds. Wounds comprises of 12% of the worldwide heap of ailments, the third imperative reason for by and large passing and the basic reason for death among 1– 40-year-olds [9]. The class of wounds the world over is affected by those occurred in street mishaps. As indicated by information given by World Health Organization, by and large mortality from street crashes establishes of close about 25% of all passing from damage [10]. Statistics of the quantity of street passing in a year contrast, because of the constrained measure of damage information gathering and examination. The information ranges from around 750 000 [11], most likely an underestimate, since it is based on the key of information from the year 1998 to 1183492 every year – which speaks to more than 3000 lives lost day by day. Roughly half of mortality is between grown-ups in the age close around of 15– 44 years [12]. In creating nations and areas – in Africa, Asia, the Caribbean and Latin America, the

 DOI : 10.35291/2454-9150.2019.0290

greater part of street passing are among people on foot, travelers, cyclists, clients of bikes, and travelers of transports and minibuses [13,14]. Around the globe, the probability of passing on in a road disasters is far higher for defenseless road customers (walkers, cyclists and motorcyclists) than for vehicle customers [14,15]. On a normal, there are close around 5,748,000 vehicle mishaps every year. Around 22% of these mishaps (about 1,259,000) are identified with climate. Antagonistic Weather related mishaps are characterized as those accidents that occur in horrible climate conditions like rain, slush, snow, haze, serious crosswinds, or blowing snow, sand, garbage. Around, almost 6,000 individuals are murdered and more than 445,000 individuals are harmed in climate related mishaps every year.

Table 1. Weather Related crash Statistics

	Weather-Related Crash Statistics	
	10-year Average [2005-2014]	10-year Percentages
Weather-Related* Crashes, Injuries, Fatalities	1,258,978 crashes	22% of vehicle crashes
	445,303 persons injured	19% of crash injuries
	5,897 persons killed	16% of crash fatalities

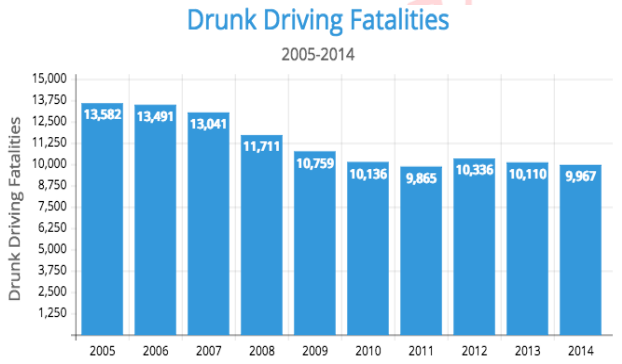

Fig1. Drunk Driving Fatalities

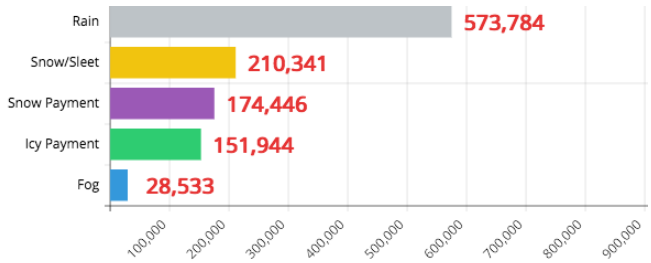

Fig 2. Number of Accidents due to Weather Conditions

It demonstrates that around 3287 passing happens in multi day and about approx. 20 to 50 million individuals get harmed or impaired. The street mishaps everywhere throughout the globe can't be set to an end however its number can be decreased. Hence this can be effectively finished with the distinctive electronic sensors, arranging all these with Arduino and by putting these sensors into the vehicle, the street crashes identified with vehicles can be decreased to a ton degree.

III. FUNCTIONAL DESCRIPTION

The detailed description of the equipments are given as follows-

1. Arduino Mega 2560 R3 –

Arduino is a use of installed framework which is utilized to exchange code from a PC framework to a physical board. The coding dialect that Arduino utilizes resembles C++which is an extremely regular dialect in the realm of registering. All the essential ideas continue as before as we figured out how to code some other programming language just the truth of the matter is that we are managing diverse sensors to work as indicated by our need. The essential outline of Arduino is appeared as follows

Fig 3. Basic diagram of Arduino mega

2. Alcohol Sensor –

The alcohol sensor, additionally called as MQ-3 is a alcohol gas sensor can be utilized as a breathalyzer for estimating and distinguishing that how much measure of liquor has devoured by a human. This can be put close to the directing of a vehicle and can set to a specific esteem with the end goal that when the esteem surpasses as far as possible the sensor can enact and prompts turning of the motor.

This should be possible by designing the alcohol sensor to the arduino.

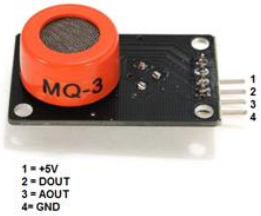

Fig 4. Alcohol sensor

3. Smoke sensor module detector- The smoke module sensor is a sort of sensor used to identify smoke or some other perilous gas in the vehicle so that if any undesirable gas or gas emerges in vehicle it can kill the framework. This should be possible by putting the smoke sensor into the hat of the vehicle so that in the event that any kind of unsafe gas emerges, by smoke sensor the motor can be killed. This can lead to lessen the street mishaps from flame and from some other hurtful gases.

 DOI : 10.35291/2454-9150.2019.0290

Fig.5 Smoke sensor

4. Humidity & Temperature Sensor –

The Humidity and Temperature sensor is utilized for detecting the interior humidity and temperature of the vehicle so that if the humidity and temperature in the inward of the vehicle surpasses to a foreordained esteem, at that point the vehicle will all of a sudden stop with the assistance of this sensor and therefore we can keep the demise due to over dampness or abundance temperature. The sensor is set to a foreordained esteem and needs to put close to the motor of the vehicle with the goal that it can without much of a stretch sense the humidity and temperature.

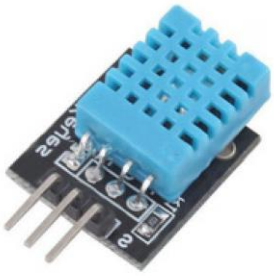

Fig 6. Humidity & Temperature Sensor

5. Accelerometer Module-

The Accelerometer depends on the essential of ADXL335 incorporated circuit. The Accelerometer is utilized to distinguish the tilt amid the mishap in a vehicle. By utilizing this module the introduction of the vehicle amid the mishap is resolved. This module is the way to distinguish the incident of mishap.

Fig 7. Accelerometer module

6. GSM Module –

GSM is a portable communication modem. It represents Global System Module. The GSM Module is utilized in the vehicle to send the warning of mishap as message when it gets the order from the Accelerometer. By this Module we can protect the individual when the message arrives.

Fig 8. GSM module

7. GPS Module –

The GPS is a Global Positioning System. It is utilized to recognize the present area of the vehicle so we can send the correct position (facilitates) of the vehicle when the mishaps occur, to the guardians or adjacent rescue vehicle through GSM module. Consequently the watchman can promptly safeguard the individual experiencing mishap by sending rescue vehicle or by heading off to that put independent from anyone else.

Fig 9. GPS module

IV. RESULTS AND DISCUSSIONS

The utilization of Embedded System in Automobiles makes the vehicle savvy and naturally illuminates the close-by rescue vehicle when mishaps occur. Different agreeable interface among equipment and programming. The Smoke sensor advises the driver about the smoke turning out from the motor of vehicle so the driver might be alert about any blame in the motor. The Temperature sensor detects the overheating of the motor and cautions the driver before any serious issue. The Infrared sensor cautions the driver about the approaching vehicle from the back with the goal that any mishap might be anticipated because of vision blanch. The GPS module refreshes the area of the vehicle and communicates something specific by means of GSM module to the spared rescue vehicle or relative when mishaps occur. The event of mishap is recognized by Accelerometer module.

V. CONCLUSIONS

This paper advances the need of a Smart vehicle which gives an easy to understand interface and alarms the familiars consequently when mishaps occur. Subsequently utilizing different sensors, Accelerometer, GPS, GSM joined through Arduino gives an answer for different issues talked about.

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The sensors utilized can be redesigned with time and thus there is expansive extension in this field later on.

REFERENCES

[1] Norman LG, Road auto collisions: the study of disease transmission, control, and counteractive action. Geneva, World Health Organization, 1962.
[2] Goals WHA27.59. Counteractive action of street auto collisions. In: Twenty-seventh World Health Assembly, Geneva, 7– 23 May 1974. Geneva, World Health Organization, 1974.
[3] Peden Metal. A 5 WHO methodology for street traffic damage counteractive action. Geneva, World Health Organization,2001
[4] Joined Nations General Assembly goals 57/309 on worldwide street wellbeing emergency [22 May 2003] . New York, NY, United Nations
[5] Joined Nations General Assembly. Worldwide street wellbeing emergency: report of the Secretary-General [7 August 2003] . New York, NY, United Nations [A/58/228]
[6] Joined Nations General Assembly goals A/RES/58/9 on worldwide street wellbeing emergency [19 November 2003] . New York, NY, United Nations.
[7] Nantulya VM, Reich MR. The ignored epi-demic: street traffic wounds in creating nations. English Medical Journal, 2002, 324:1139– 1141.
[8] Nantulya VM et al. The worldwide test of street traffic wounds: would we be able to accomplish value in wellbeing? Damage Control and Safety Promotion, 2003, 10:3– 7.
[9] Transport security execution in the EU: a factual diagram. Brussels, European Transport Safety Council, 2003.
[10] Murray CJL et al. The Global Burden of Disease 2000 venture: points, techniques and information sources [revised]. Geneva, World Health Organization, 2001 [GPE Discussion Paper No. 36].
[11] Gururaj G, Thomas AA, Reddi MN. Under-detailing street traffic wounds in Bangalore: suggestions for street security arrangements and star grams. In: Proceedings of the fifth World Conference on Injury Prevention and Control. New Delhi, Macmillan India, 2000:54 [Paper 1-3-I-04].
[12] Varghese M, Mohan D. Transportation wounds in provincial Haryana, North India. In: Proceedings of the International Conference on Traffic Safety. New Delhi, Macmillan India, 2003:326– 329.
[13] Mohan D. Traffic security and wellbeing in Indian urban areas. Diary of Transport and Infrastructure, 2002, 9:79–92.
[14] Martinez R. Traffic security as a medical problem. In: von Holst H, Nygren A, Thord R, eds. Traffic wellbeing, correspondence and wellbeing. Stockholm, Temaplan AB, 1996.
[15] Evans L. Traffic security and the driver. New York, NY, Van Nostrand Reinhold,

 DOI : 10.35291/2454-9150.2019.0290