Advanced Safety System in Automobiles

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Abstract:

The rapid growth of generation and infrastructure has made our lives much less tough. The arrival of era has additionally improved the traffic dangers and the street injuries take region often which starts massive loss of existence and assets because of the impoverished disaster facilities. This Proposed Technology affords a great technique to this hitch. An accelerometer can be carried out in a car alarm application so that unpredictable driving can be observed. It may be employ as a collide or over turning of the automobile detector at some stage in and after a collide with indicators from an accelerometer, a terrible twist of fate may be recognized. As said by means of this proposed approach when a vehicle gets an twist of fate, right away Vibration sensor will find out the sign or if a car rolls over, and piezoelectric sensor will exhibits the wave and sends it to Arduino UNO controller. The controller sends that observant record through the gsm modem include the vicinity to police manipulate room or a salvage group. So the police can right away hint the region via the gps modem, after amassing the records.

After observes the vicinity required movement may be taken. If the person receives a effect accident or if there may be no vital warning to all and sundry`s life, then the conscious signal can be eliminated via the motorist by the use of a transfer boom with the intention to exclude use up the treasured time of the scientific endanger squad. This proposed method is useful in locating the twist of fate precisely via vibration sensor. There is a selection for development and as a in addition execution we are able to attach a wi-fi webcam for apprehend the images so one can beneficial in imparting cause pressure`s assist.

Keywords: Arduinouno, GPS, GSM, IR Flame Detection sensor, Peizo Vibration Sensor.

I. INTRODUCTION

Vehicle following framework essential factor is to offer securi-ty to all cars. Mishap prepared framework principle factor is to defensive people in mishaps. This is advanced safety frameworks for vehicles. The most trendy like GPS are exceeding-ly valuable now day by day, this framework empowers the proprietor to watch and track his automobile and discover automobile improvement and its beyond sports of vehicle.

This new innovation, famously called automobile Tracking Systems which made severa marvels inside the protection of the auto. This machine is outfitted directly to the automobile in any such way, that it isn't unmistakable to any person who is internal or outside of the automobile. In this manner, it is applied as a clandestine unit which in step with-sistently or through any limit to the framework, sends the area infor-mation to the looking at unit.

At the element while the auto is stolen, the place records from following framework can be applied to discover the place and may be informed to police for further interest. Some Vehicle music-ing System might also even distinguish unapproved tendencies of the automobile and after that caution the proprietor. This gives an facet over exceptional bits of innovation for the identical motive. This mishap prepared framework in it distinguishes the mishap and the region of the mishap passed off and sends GPS instructions to the predefined versatile, PCandso
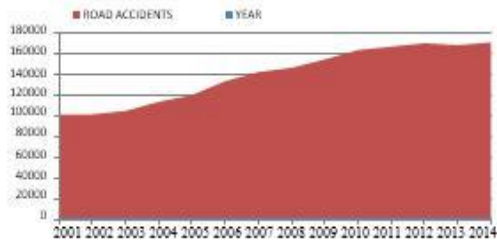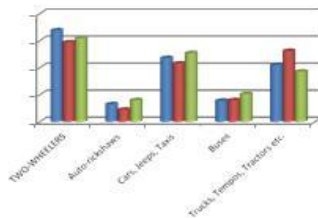
Fig 1 : Road Accident Year-wise 2001-2014

Fig 2 : Road Accidents Based on Type
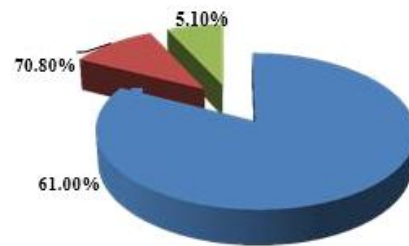
■ Speeding ■ Over-taking ■ Intake of alcohol

Fig 3 : Road Accidents - CAUSE

II. METHODOLOGY

The a prime instance of this Accident Detection and records passing machine makes use of the accompanying advances:

1. The entire setup is portray as Block Diagram.

2. A Piezoelectric sensor recognizes the number one episode of the mishap moreover, it's miles hinted to the MCU.

3. The Latitude and Longitude are identified using GPS and it's far sent as message to the salvage colleagues through GSM.

4. The message recipient wide range is pre positioned away within the EEPROM.

5. A OFF Switch is furthermore orchestrated on occasion of want to keep away from wrong message.

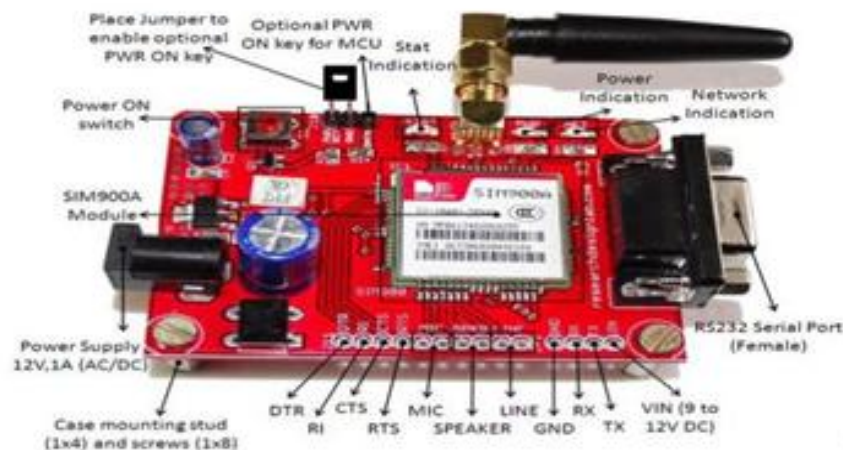*GSM – Global System for Mobile Communication (SIM900A)*

Fig 4: GSM Communication system

The industrial enterprise present day sequential RS232 interface for easy association with PCs and distinctive gadgets Provides sequential TTL interfacefor easy and direct interface to Arduino UNO Optionally to be hadUSB interface for clean interface to PCs, PCs, and so forth .OnboardMIC and Speaker circuits and three.5mm sound connectors for directassociation with mics and audio gadget. All pins of the SIM900 modulecan be taken advantage of for development using locally to be hadextension gaps. GPIO pins, Serial correspondence pins, 2 PWM pins,I2C pins and ADC pins are broken out to standard zero.1" dispersedgaps for smooth extension Power, Status and Network LEDs foreasy investigating Can be carried out for GSM primarily based Voice inter-changes, Data/Fax, SMS,GPRS and TCP/IP stack Can be controlledthru wellknown AT directions.

Module's interest mode can be controlled via the PWR Key associated with the PWRKEY stick (allude the SIM900 datasheet for extra statistics) Comes with an installation cord recieving wire for higher accumulating. Board offers an alternative to which includes an outer radio twine through a SMA connector. The SIM900 lets in a customizable sequential baud charge from 1200 to 115200 bps (vehicle baud as a depend of course) Modem a low strength con-sumption of zero.25 A in some unspecified time in the future of everyday obligations and around 1 A at some point

of transmission. Working Voltage: 7 – 15V AC or DC (board has domestically to be had rectifier)

GPS - Global Positioning System

Fig 5: GPS SR-92

As appeared in the above pictures, ProGin SR-92 is a low-control, ultra-superior, simple to utilize GPS shrewd radio wire module dependent on SiRF's third era single chip. Its low power con-sumption and elite empowers the selection of handheld applica-tions. The thin plan permits SR-92 to be set on top side of the lodging to have best GPS signal gathering. The 5-stick I/O inter-face is then associated with the principle board with either con-nector or wire fastening. The coordinated reception apparatus configuration lessens the RF and EMI issues to least. Quick selec-tion and high return master duction ends up conceivable. The power control highlight is very con-venient to kill on/off power through GPIO control stick. It's particularly valuable in cases, for example, to mood killer control as the client simply needs to watch a film and GPS capacity isn't required in the PMP case. GPS helps in both following and route reason. Following sys-tems is utilized to monitor the vehicle without the mediation of the driver. Yet, a route framework directs the driver to achieve the goal with no disturbances. Both following and route utilizes a similardesign. As a mishap happens the following stem recogniz-es the clumsy vehicle and a message is sent to the salvage group through a call or SMS.
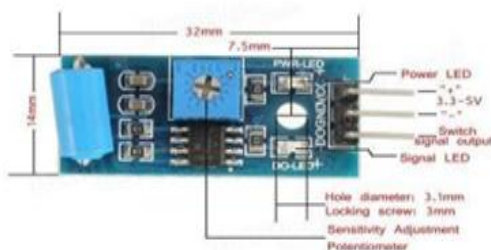
VIBRATION SENSOR (SW-420):

Fig 6: GPS SR-92

They have been effectively utilized in different applica-tions, For instance, in medicinal, aviation, atomic instrumentation, and as a tilt sensor in purchaser hardware or a weight sensor in the touch stack of cellular telephones. In the commercial organization, piezoelectric compo-nents are utilized to show ignition even as growing internal burning automobiles. The sensors are both straightforwardly established into more gaps into the chamber head or the

flicker/gleam attachment is provided with an implicit smaller than not unusual piezoelectric sen-sor. The ascent of piezoelectric innovation is straightforwardly diagnosed with an entire lot of natural blessings. The excessive modulus of pliability of numerous piezoelectric materials is compa-rable to that of numerous metals and is going up to 106 N/m².Even however piezoelectric sensors are electromechanical frameworks that re-spond to stress, the detecting components show very almost zero diversion.

This offers piezoelectric sensors roughness, a totally excessive commonplacerecurrence and a great linearity over a huge plentifulness run.Moreover, piezoelectric innovation is unfeeling in the path of electro-magnetic fields and radiation, empowering meas-urements underneathun forgiving conditions. This impact is likewise everyday to piezoinnovative materials. Gautschi in Piezoelectric Sensorics (2002) offersthis examination desk of tendencies of piezosen-sor substances ver-sus different types. At the point when this no vibration, this mod-ule yield cause LOW the signal shows LED mild, And the othermanner spherical..
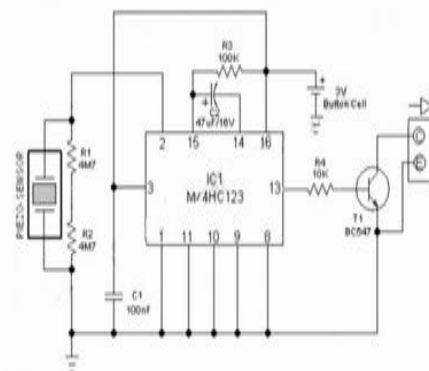

Fig 6.1: Board Schematic of Vibration Sensor

III. LITERATURE SURVEY

The Rapid improvement of innovation and framework has made our lives less complex. The technique of innovation has addi-tionally extended the traffic perils and the road mishaps take place a good deal of the time which motives massive lack of life toll and assets because of the terrible crisis places of work.

This paper will offer a super answer for this disad-vantage. This paper offers car mishap discovery and geared up framework with SMS to the customer characterised transportable numbers.

The GPS following and GSM caution primarily based calculation is struc-tured and finished with Arduino UNO in set up frameworkarea. The proposed Vehicle mishap region framework can studyland records car-matically and sends a prepared SMS with respect tomishap. Exploratory work has been completed cautiously. Theoutcome demonstrates that higher affectability and exactness is infact done the usage of this assignment. EEPROM is interfacedto store the flexible numbers all of the time. This made the undertaking extraeasy to recognize and reliable. This paper proposes every otherlength in order to permit early reaction and salvage of mishapexploited humans; sparing lives and homes.

Proposed framework makes use of the capability of GPS and GSM alongside-element the android telephone to offer a solution which can be applied to unequivocally recognize the mishap spot and to ship the disaster warning to the adjoining hospital's ICU and to the unfortunate casualty'srela-tives. Sensors and the switches/outstanding segments carried out in framework is circulated in some unspecified time in the future of the auto eventually gives greater adaptability while mounting into the car. Utiliz-ing the open supply android includes any other preferred role as we are able to address top of some officially built APIs for GPS and GSM interfacing henceforth diminishing the absolute genius ject completing time. In wellknown the framework execution is extend-ed. In profoundly populated Countries like India, ordinary indi-viduals lose their lives in mild of mishaps and awful disaster offices. These lives could have been spared if restorative offices are given at the opportune time.

This paper infers framework this is a solution for this downside. Accelerometer sensor may be implemented in vehicle protection body-paintings to discover vibrations in car and GPS to provide place of vehi-cle, so unsafe riding can be outstanding Automatic mishap reputation and announcing framework is planned on this paper. At the point while mishap oc-puppies, it's miles detected by means of Accelerometer. Short message along with loca-tion of mishap obtained utilizing GPS, is sent by using GSM arrange. It gives over 70% wellbe-ingto four wheeler.

IV. HARDWARE DESCRIPTION

Square Diagram of Vehicle Accident Detection and Alert Sys-tem:
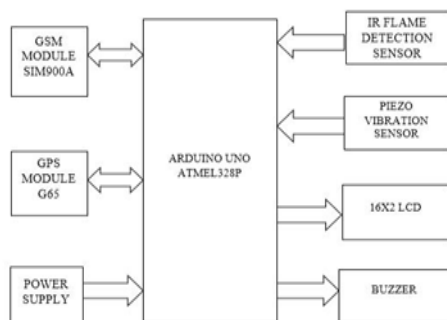
REGULATED POWER SUPPLY:

Power supply is a supply Of electric powered power. A tool or framework that provisions electrical or special types of energy to a yield burden or amassing of burdens is referred to as a electricity deliver unit or PSU. The term is maximum normally linked to electric electricity sources, an awful lot much less regularly to mechanical ones, and from time to time to different humans.

DESCRIPTION OF ARDUINO UNO BOARD (UNO 328P):

	UNO		MEGA	
Microcontroller	ATmega328	Microcontroller	ATmega2560	
Operating Voltage	5V	Operating Voltage	5V	
Input Voltage (recommended)	7-12V	Input Voltage (recommended)	7-12V	
Input Voltage (limits)	6-20V	Input Voltage (limits)	6-20V	
Digital I/O Pins	14 (of which 6 provide PWM output)	Digital I/O Pins	54 (of which 15 provide PWM output)	
Analog Input Pins	6	Analog Input Pins	16	
DC Current per I/O Pin	40 mA	DC Current per I/O Pin	40 mA	
DC Current for 3.3V Pin	50 mA	DC Current for 3.3V Pins	50 mA	
Flash Memory	32 KB (ATmega328) of which 0.5 KB used by bootloader	Flash Memory	256 KB of which 8 KB used by bootloader	
SRAM	2 KB (ATmega328)	SRAM	8 KB	
EEPROM	1 KB (ATmega328)	EEPROM	4 KB	
Clock Speed	16 MHz	Clock Speed	16 MHz	

Table 1: arduinouno board

The Arduino Uno is a microcontroller board counting on the ATmega328. It has 14 advanced statistics/yield pins (of which 6 may be applied as PWM yields), 6 smooth facts assets, a 16 MHz precious stone oscillator, a USB affiliation, a electricity jack, an ICSP header, and a reset entice. It includes everything anticipated to help the microcontroller; clearly interface it to a PC with a USB hyperlink or energy it with an AC-to-DC connector or battery to begin. The Uno contrasts from every single going in advance than board in that it does not rent the FTDI USB-to-sequential the usage of force chip. Rather, it includes the Atmega8U2 modified as a USB-to-sequential con-verter. "Uno" shows one in Italian and is called to check the up and coming arrival of Arduino 1.0.

The Uno and rendition 1.Zero can be the reference diversifications of Arduino, pushing in advance. The Uno is the most contemporary in a progres-sion of USB Arduino sheets, and the reference version for the Ar-duino degree; for an exam with beyond rendi-tions.
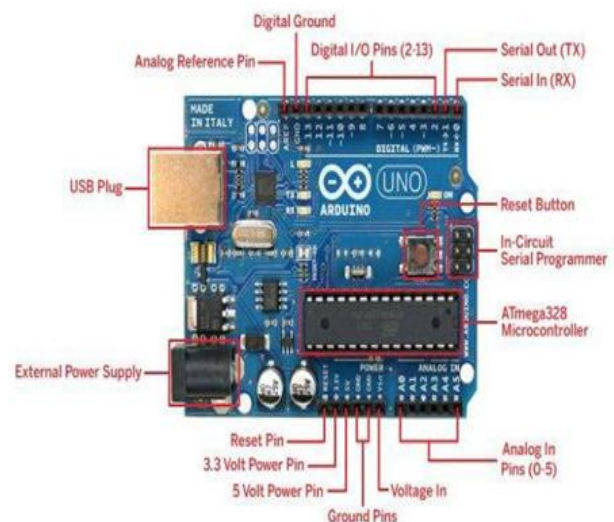

Fig 7: Arduino UNO Board

Technical Specifications:

Microcontroller ATmega328
Operating Voltage 5V
Input Voltage (recommended) 7-12V
Input Voltage (limits) 6-20V
Digital I/O Pins 14 (of which 6 provide PWM output)

Analog Input Pins   6
DC Current per I/O   Pin 40 mA
DC Current for 3.3V   Pin 50 mA
Flash Memory 32 KB of which 0.5 KB used by bootloader
SRAM   2 KB
EEPROM   1 KB
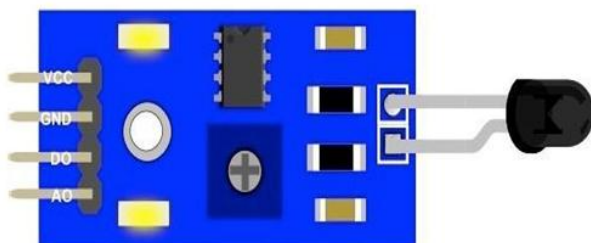Clock Speed   16 MHz

FLAME SENSOR MODULE:

Fig 8:Flame sensor

This module is delicate to the fire and radiation. It additionally canrecognize common light source in the scope of a wavelength760nm-1100 nm. The discoveryseparation is up to 100 cm. TheFlame sensor can out-put computerized or simple sign. It very wellmaybeutilizedasafirecautionor infirefightingro-bots.
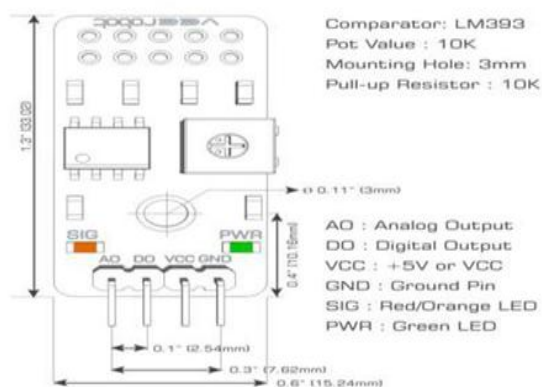

Fig 8.1:Fire locator

A fire locator is a sensor intended to distinguish and react to the nearness of a fire or fire, permitting fire discovery. Reactions to an identified fire rely upon the establishment, yet can incorporate sounding an alert, deactivating a fuel line, (for example, a propane or a gaseous petrol line), and initiating a flame concealment framework.
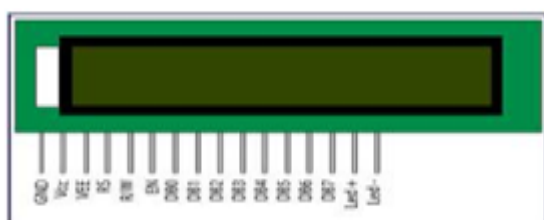
*16x2 LCD DISPLAY:*

Fig 9:16x2 LCD Display

The 16 x 2 canny alphanumeric spot grid presentations is equipped for showing 224 distinct characters and images. A full rundown of the characters and images is imprinted on pages 7/8 (note these images can fluctuate between brand of LCD utilized). This booklet gives all the specialized determinations to associating the unit, which requires a solitary power supply (+5V).

Table no 2: Standard Character Pattern Of 16X2 LCD

Table 2 :LCD(20 *4)

SIM800A 5v/4v	Arduino 5v
SIM800A GND	Arduino GND
SIM800A SIM TXD	Arduino D8
SIM800A SIM RXD	Arduino D7

FLOWCHART OF THE PROJECT:
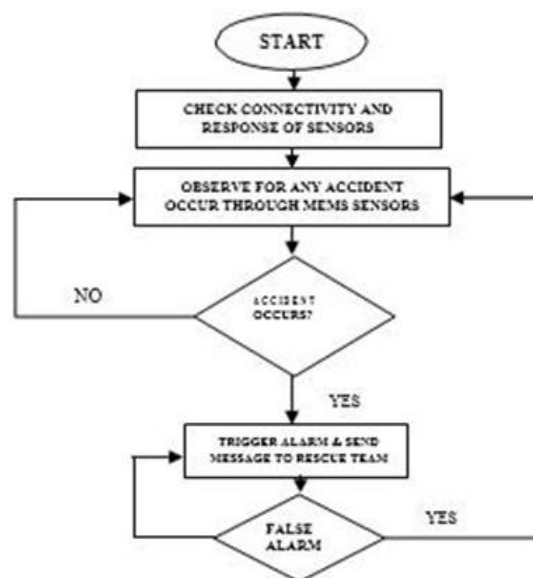
Flow Diagram of Accident Detection system
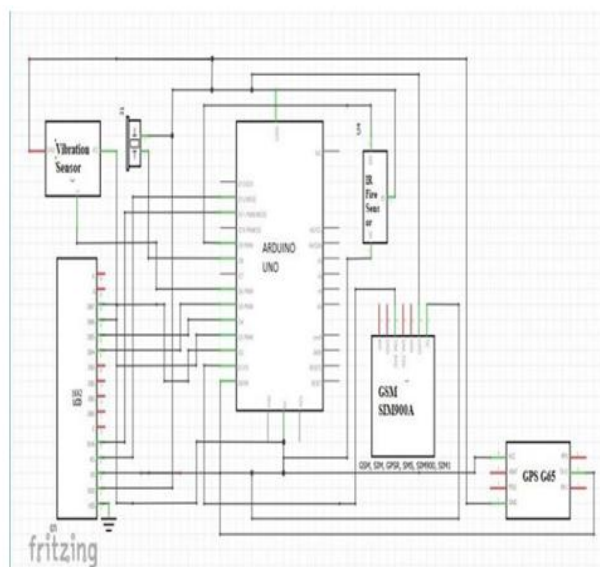
SCHEMATIC DIAGRAM

Fig 10 : Schematic diagram of proposed system

ADVANTAGES

1. Easy of operation.
2. High security.
3. Design is very Simple and Reliable.
4. Separates both GSM and GPM

APPLICATIONS

1.Recovery of stolen vehicles:

With assistance of RF id when the vehicle is stolen, finding and Recuperation of the vehicle is conceivable.

2.Group Management:

A gathering or a particular kind of vehicle can be overseement with the assistance of MCU unit.

3.Tracking of Asset:

Following of the Vehicle at the Real Time condition is an ex-tremely huge bit of leeway.

4.Tracking of On Transition devices

At the point when the vehicle is progress starting with one spot then onto the next likewise the Tracking framework is dynamic.

V RESULTS

The proposed strategy for Vehicle Accident Detection and Alert System has been effectively structured and tried. Incorporating fea-tures of all the equipment segments utilized have created it. Pres-ence of each module has been contemplated out and set cau-tiously in this manner adding to the best working of the unit. Fur-thermore, utilizing profoundly progressed IC"s and with the assis-tance of developing innovation the plan has been effectively exe-cuted.

FINAL SETUP:

Fig 11: Displaying of project title

Fig 11.1 Internal connections of the project

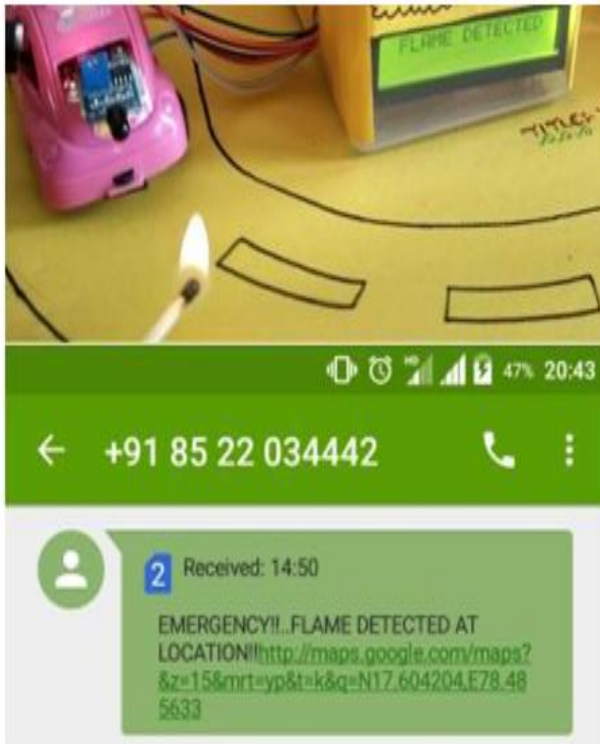**Fig 11.2: Accident lacation through link**

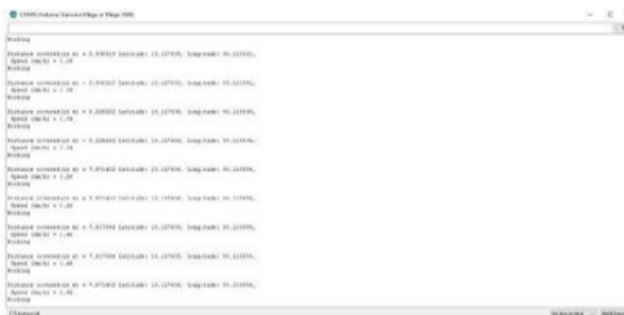**Fig 11.3: Flame detection through link**

Fig 11.4: Gyroscope Reading

Fig 11.5: Latitude and Longitude Details

VI. CONCULSION

The Expected overall performance is accomplished through implementa-tion of the proposed system. The sensor and other required additives are dispensed at some stage in the car imparting extra essential effects to hit upon accidents. The proposed sys-tem additionally may be used for traffic estimation and tool steady with-formance estimation to prevent lack of lifestyles to its most.

VII. FUTURE SCOPE

In destiny they evolved android software system will make sure the protection of the vintage elderly people and decrease danger of bodily challenged people through alerting the person fall detection and the everyday fitness state of affairs. The devicehelps impartial dwelling and self assurance of the vintage aged humans efficiently. And additionally the device is extensively client interface. The sensors used in this assignment additionally wearable and slight weight and the transmission form of the device may be very excessive because of the GSM, is the number one spotlight of the venture.

VIII. REFERENCES

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IX. AUTHOR PROFILE

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Panduranga.V is by and by filling in as an Assistant Professor at CMRCET, Hydera-bad. He has gotten M.Tech (VLSI System Design) from JNTU Hyderabad. He has over 12 years of involvement in the field of instructing. He has contributed around5 research papers in diaries and Conferences of national/global notoriety. His regions of intrigue incorporate VLSI System de-sign,Communication and Embedded frameworks.

Mr.ANIL SANTI is presently working as an Assistant Professor at CMRCET, Hyderabad. He had received M.Tech (Systems & Signal processing) from JNTU, Hyderabad. He has more than 5 years of teaching experience. His interested areas are Wireless communications, Antennas, Signal Processing