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Automatic Vehicle Accident detection using GSM and GPS

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Abstract—The Rapid magnification of technology and infrastructure has made our lives more facile. The advent of technology has additionally incremented the traffic hazards and the road accidents take place frequently which causes immensely colossal loss of life and property because of the poor emergency facilities. Our project will provide an optimum solution to this disadvantages. An accelerometer can be used in a car alarm application so that dangerous driving can be detected. It can be utilized as a crash or rollover detector of the conveyance during and after a crash. With signals from an accelerometer, a rigorous contingency can be apperceived. According to this project when a conveyance meets with a contingency immediately Vibration sensor will detect the signal or if a car rolls over, and Micro electro mechanical system (MEMS) sensor will discovers the signal and sends it to ARM controller. Microcontroller sends the alert message through the GSM MODEM involving the location to police control room or a rescue team. So the police can immediately trace the location through the GPS MODEM, after holding the information. Then after conforming the location obligatory action will be taken. If the person meets with a minuscule contingency or if there is no solemn threat to anyone`s life, then the alert message can be ended by the driver by a switch provided in order to eschew wasting the valuable time of the medical rescue team. This paper is utilizable in detecting the contingency defined by indicate of both vibration sensor and Micro electro Mechanical system (MEMS). As there is a scope for amelioration and as a future implementation we can integrate a wireless webcam for capturing the images which will avail in providing driver`s assistance.

Keyword:-GSM-GPS system, Accelerometer, Alcohol Sensor, Glass break sensor

I. INTRODUCTION

The high ordinate dictation of automobiles has withal incremented the traffic hazards and the road accidents. Life of the people is under high jeopardy. This is because of the lack of best emergency facilities available in our country. An automatic alarm contrivance for conveyance accidents is introduced in this paper. This design is a system which can discover accidents in significantly minimum time and sends the fundamental information to first avail centre within a few seconds including geographical coordinates, the time and angle in which a conveyance contingency had occurred. This alert message is delivered to the rescue team in a minimum time, which will avail in preserving the valuable lives. A Switch is withal provided in order to terminate the sending of a message in infrequent case where there is no casualty, this can preserve the precious time of the medical rescue team. When the contingency occurs the alert message is sent independently to the rescue team and to the police station. The message is sent through the GSM module and the location of the contingency is detected with the avail of the GPS module. The contingency can be detected precisely with the avail of both Micro electro mechanical system (MEMS) sensor and vibration sensor. The Angle of the rolls over of the car can withal be kenned by the message through the MEMS sensor. This application provides the optimum solution to poor emergency controversy provided to the roads accidents in the most suitable way.

II. METHDOLOGY

The prototype model of an automatic conveyance contingency detection and messaging utilizing GSM and GPS modem utilizing ARM7 working will be made in the following steps:

A. Consummate layout of the whole set up will be drawn in form of a block diagram.
B. A piezoelectric sensor will first sense the incidence of a contingency and give its output to the microcontroller.
C. The GPS detects the latitude and longitudinal location of a conveyance.
D. The latitudes and longitude position of the conveyance is sent as message through the GSM.
E. The phone number is pre-preserved in the EEPROM.
F. Whenever a contingency has occurred the position is detected and a message has been sent to the pre-preservednumber.

GSM – Ecumenical System for Mobile CommunicationGSM is utilized as a media which is utilized to control and monitor the

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transformer load from any place by sending amessage. It has its own deterministic character. Thereby, here GSM is utilized to monitor and control the DC motor,Stepper motor, Temperature sensor and Solid State Rlay by sending a message through GSM modem. Hence no desideratumto waste time by manual operation and conveyance. Hence it is considered as highly reliable communication throughthe mobile which will be utilizable in industrial controls, automobiles, and appliances which would be dominate fromany place else. It is additionally highly economic and less sumptuous; hence GSM is promote most for this mode ofcontrolling.

GPS - Ecumenical Situating System GPS is utilized in conveyances for both tracking and navigation. Tracking systems make easy a base station to keep track of the conveyances without the interposition of the driver where, as navigation system avails the driver to reach the destination. Whether navigation system or path system, the architecture is more or less homogeneous. When a contingency occurred in any place then GPS system tracks the position of the conveyance and sends the information to the particular person through GSM by alerting the person through SMS or by a call.

GSM – Global System for Mobile Communication

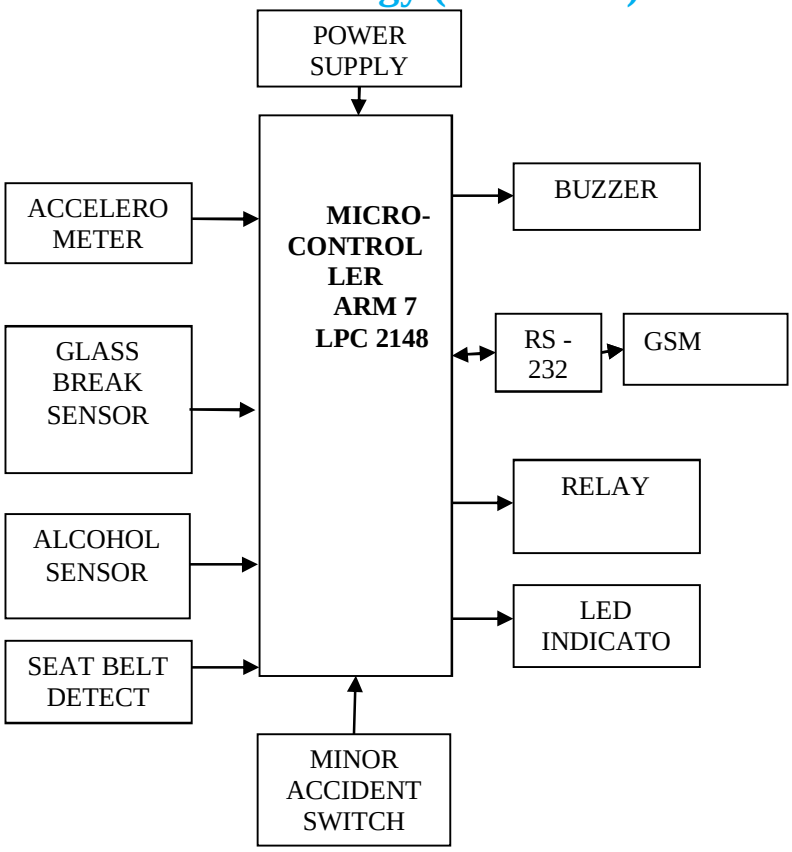
III. RELATED WORK

Many researchers had made the project cognate on contingency alarm system. This technology includes: GPS, GSM, communication and others. But we utilize SIM 908 module which is the coalescence of two contrivances designated GSM andGPS. The Contingency alarm system has two components, first is controlling contrivance which sends the messages and the other ismobile unit which admit the messages. The system processes, interfaces, connections, data transmission and reception of data between the controlling contrivance and mobile unit are working prosperously. These results are compatible with SIM 908 technology. The contingency alarm system is an electronic contrivance, installed in all types of car, robots and line adherent. This system includes piezoelectric sensor which quantifications vibration and detects accidents. It withal includes accelerometer which quantifications static expedition of gravity in tilt-sensing applications, as well as dynamic expedition resulting from kineticism. Furthermore, this system is additionally utilized for detecting the alcoholic drivers with the utilization of alcohol sensor (MQ3). The temperature sensor is additionally a component of contingency alarm system which detects the fire.

IV. BLOCK DIAGRAM AND DESCRIPTION

The block diagram of Contingency Alarm System utilizing GSM, GPS and Accelerometer is shown in the figure 2. It consists of the Power supply section, LPC 2148, SIM 908, Accelerometer, glass break sensor, flex sensor and Alcohol sensor. The GSM board has a substantial SIM card with ample recharge amountto send SMS. The circuit is powered by 3.3dc.

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A. Power supply unit

The puissance supply circuit consists of a transformer connected to a bridge rectifier which is then passed on to the LM7805 regulator through a filter and then forward to theLM317regulator.

B. LPC 2148

This simplicity results in a high ordinates dictation throughput and impressive authentic-time interrupt replication from a diminutive and cost-efficacious processor core. Pipeline techniques are employed so that all components of the processing and recollection systems can operate perpetually. Typically, while one injective authorization is being executed, its successor is being decoded and a third ordinates dictation is being fetched from recollection. The ARM7 processor additionally employs a unique architectural strategy kenned as Thumb, which makes it ideally suited to high-volume applications with recollection restrictions, or applications where code density is an issue. The key conception behind Thumb is that of a super-reduced ordinant dictation set.

C. Accelerometer Sensor

Accelerometers can be used to measurement of vehicle acceleration and They allow for evaluation of overall vehicle performance as well as response. This information can then be used to make adjustments to various vehicle systems as needed.

D. Alcohol sensor

This alcohol sensor is opportune for detecting alcohol concentration on your breath, just like your mundane breathalyzer. It has a high sensitivity and expeditious replication time. Sensor provides an analog resistive output predicated on alcohol concentration. The drive circuit is very easy, all it requires is one resistor. A simple interface could be a 0-3.3V ADC.

E. Glass break sensor

These sensors are commonly used close to glass doors or glass store-front windows to detect if an intruder broke the glass andentered.Glass break detectors customarily utilize a microphone, which monitors any noise or vibrations emanating start the glass. If the vibrations exceed a certain threshold (that is sometimes utilize selectable) they are analyzed by detector circuitry.

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F. MAX 232

The MAX232 is a dual driver/receiver that contains a capacitive voltage generator to supply TIA and EIA-232-F voltage levels from a single 5-V supply. Each receiver change TIA and EIA-232-F inputs to 5-V TTL and CMOS levels. These receivers have a normal threshold of 1.3 V, a normal hysteresis of 0.5 V, and can accept ±30-V inputs. Each driver converts TTL and CMOS input levels to TIA and EIA-232-F levels.

G. RELAY

It is ON/OFF Switch which uses as 12V supply it is electrically operated switch and A relay is an electrically operated switch .A simple electromagnetic relay consists of coil of wire wrapped around soft iron core and iron yoke which provide less reluctance path for magnetic flux

1) Advantages

a) Easy to operate.
b) Sophisticated security.
c) Simple and Reliable Design.
d) Isolates both GSM and GPS signal

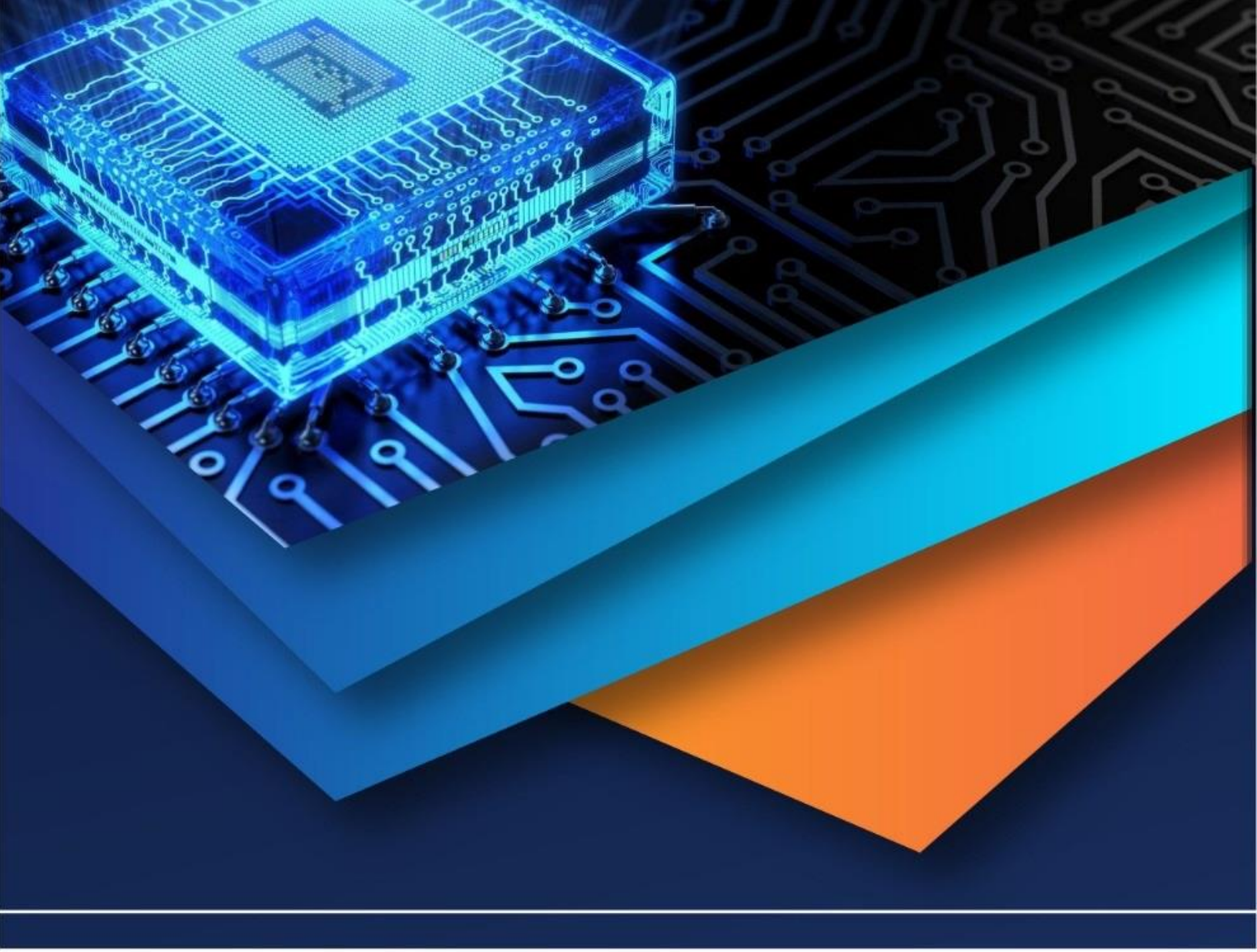
V. CONCLUSION

This system can abbreviate the alarm time greatly and locate the contingency spot accurately, realizing the automation of contingency detection and information transmission. Consequently, it will preserve the rescuers form wasting their time in search. The experiments of model car's collision and rollover proved that this system can automatically detect corresponding contingency and sent cognate information. Such functions can be achieved by buttons representing "mendacious alarm", "help" and "safety", respectively.

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