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ACCIDENT DETECTION SENSOR

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INTRODUCTION

The accidents and the accident injuries in the world is increasing in our day today life so there must be good and efficfient control for the safety of human life violation of traffic rules drunk driving, careless driving are some causes of road accidents as we know we cannot stop the accidents but we can reduce the accidents by some precautionary measures. Road accidents are the most unwanted thing to happen to a road user, though they happen quite often. The most unfortunate thing is that we don't learn from our mistakes on the road. Most of the road users are quite well aware of the general rules and safety measures while using roads but it is only the laxity on part of road users, which causes accidents and crashes.

Most of the fatal accidents occur due to over speeding. It is a natural psyche of humans to excel. But when we are sharing the road with other users we will always want to take control. Increase in speed multiplies the risk of accident and severity of injury during an accident. A vehicle moving at high speed will have greater impact during the crash and hence will cause more injuries. Some deaths also happen due to the lack of immediate first aid. Another problem is the lack of information about the vehicle position.

The main aim of this project is to construct a smart vehicle system with minimizing the limitations of existing methods and also enhancing the security of vehicles and human beings and also reducing accidental injuries. Smart vehicle system will entail a speed and other parameters of vehicle sensing mechanism which automatically messages to personal contacts with the details of vehicle position when an accident occurs using the gsm/gprs system. The system also contains a fire sensor and an eye blink sensor. A fire sensor, eye blink sensor which senses various parameters of the vehicle is connected to a microcontroller which detects when the abnormal conditions occur or any accidents occur then sends a text message, using gsm technology, to the emergency contacts. The text sent to various authorities contains the details of the vehicle and its position. If any ignition occurs in the vehicle, then the fire sensor sends text to the emergency contacts.

The procedure deals with the automatic accident detection mechanism.

(a) the detection of an accident with the help of sensed information through appropriate sensors where an algorithm has been developed to gather and monitor the required information. Based on the sensed information, it performs the logical computation to detect the accident. Once it is detected, it generates an alert message. This article includes the details of data processing of the accident detection module in a practical manner. Additionally, the contribution is presented through a flow chart of the proposed system to detect an accident correctly and in a timely manner.

The second module is used to identify the location of the accident and medical service nearby. It then notifies the hospital not only about the condition of the person but also about the severity of the event based on the damage. Moreover, it stores useful information about the incident for future use.

the third part deals with the hospital module, which not only sends the ambulance to the incident location on emergency alert, but also gathers the passenger's status like injuries, deaths along with medical proof of alcohol and personal details like name, age, and the

Number of passengers, etc

OBJECTIVES

At present criteria, we cannot detect where the accident has occurred and hence no information related to it, leading to the death of an individual. The research work is going on for tracking the position of the vehicle even in dark clumsy areas where there is no network for receiving the signals. In this project gps is used for tracking the position of the vehicle, gsm is used for sending the message. Hence with this project implementation we can detect the position of the vehicle where the accident has occurred so that we can provide first aid as early as possible. This project presents a vehicle accident detection and alert system with sms to the user defined mobile numbers.

The gps tracking and gsm alert based algorithm is designed and implemented with embedded system domain. The proposed vehicle accident detection system can track geographical information automatically and sends an alert sms regarding accidents. Experimental work has been carried out carefully. The result shows that higher sensitivity and accuracy is indeed achieved using this project. This made the project more user-friendly and reliable. The proposed method is verified to be highly beneficial for the automotive industry.

So, in our project we have used a gsm/gprs modem to locate the exact position of the vehicle. We propose an intelligent vehicle system for accident prevention and making the world a much better and safer place to live. Fire and blink sensors are reliable for detecting accidents and this technique certainly can save lots of lives. Crash detection systems must be equipped with a combination of different sensors. Detecting humans including obstacles will certainly give us a better solution to reduce the death of humans in road crashes.
This system aims to alert the nearby medical center about the accident to provide immediate medical aid. The attached accelerometer in the vehicle senses the tilt of the vehicle and the a heartbeat sensor on the user's body senses the abnormality of the heartbeat to understand the seriousness of the accident.

This proposed IOT based accident detection system helps to reduce the loss of life due to accidents and also reduces the time taken by the ambulance to reach the hospital.
The sensor helps in increasing the time for the treatment of an injured patient. It instantly notifies the nearest medical centre for help which fastens the process. This enables the ambulance to reach the site of the accident in a short period of time. The patient is able to receive treatment quickly and increases the chance of survival. This will also help the health care professionals by giving them extra time to assess the condition of the patient and treat them accordingly. In the absence of this device, the lives of people who could've been saved easily were degraded or lost. This increases the probability of people being saved after meeting with an accident. The main purpose of this device is to reduce the number of deaths caused due to road accidents. This device will not be able to reduce the number of accidents but it will definitely save lives. This device will be able to make the entire process efficient. The health care professionals have the advantage of extra time and excess information about the accident which makes it helpful for them.

REVIEW OF LITERATURE

According to the World Health Organization (WHO) report, nearly 1.35 million people died in road accidents, making road traffic injuries the eight leading cause of death glob- ally. The number of fatalities associated with road acci- dents is extremely high, thus, measures must be taken to im- prove road safety. Most injuries incurred by accidents are not serious, and the victim’s life can be saved if rescued timely. However, it takes additional delay to manually notify the emergency teams due to poor communication mechanisms, thus, victims are left unattended for a long time, resulting in an increased death rate.
The consequences of road accidents are not just constrained to the loss of human lives yet, also incorporate the destruction of property, traffic blockages, and immense economic loss. Thus automatic accident detection systems are the need of time, which can speed up the rescue operations and limit the causalities after the mishap and numerous lives can be saved. This paper features existing mechanisms to detect accidents, its working, and limitations. Furthermore, accident prevention methodologies, accident contributing factors are highlighted as well. This study critically reviews existing literature on accident detection and prevention techniques, with the objective that smart systems can be developed with improved accuracy and better

strategies to control accident causing factors while watching out for the existing challenges in the current systems.

Nowadays, many of the vehicle accidents occur due to over speed, drowsy driving and drunk drivers. According to statistics, for every four minutes, a person dies because of road accidents and also thousands of accidents are recorded in India, which is more in number compared to all other accidents. But their lives could have been saved in the presence of emergency indicators. So, we are going to implement our ideas, regarding the life saving measures and precautionary measures to prevent the accident.

Everyday many lives are lost due to accidents on roads. Normally death happens due to the injury suffered by the passenger in the road accident but most of the time it also has been seen that the information of the accident reaches the emergency department very late, consequently the injured person could not sustain. So, there must be an automatic system in every car which not only detects a road accident efficiently but also informs the emergency department very instantly. The advent of technology has also increased the traffic hazards and the road accidents take place frequently which causes huge loss of life and property because of the poor emergency facilities. Our project will provide an optimum solution to this drawback. The high demand of automobiles has also increased the traffic hazards and the road accidents. Life of the people is under high risk. This is because of the lack of best emergency facilities available in our country. At present criteria, we cannot detect where the accident has occurred and hence no information related to it, leading to the death of an individual.

METHODOLOGY

There are many families in the microcontroller but here the ATMEGA 8A is used because it provides the high output with low input. The operating voltage of the ATMEGA is 2.2-5.5 volts where the consuming input is low compared to other.It is performing with advanced RISC architecture with non-volatile memory segments.It allows 130 instructions which is normally high compared to other and it comprises of 16 bit address with 8 bit data. The data retention of the ATMEGA 8A is 20 years at 850 C and 100 years at 250C. The peripheral features includes two 8-bit Timer/Counters with Separate pre scalar, one Compare Mode One 16-bit Timer/Counter with Separate Pre scalar, Compare Mode, and Capture Mode. One of the special features of controller is Power-on Reset and Programmable Brown-out Detection with Internally Calibrated RC Oscillator.It can be varied with five sleep modes like Idle, ADC Noise Reduction, Power-save, Power-down, and Standby.

Gsm Module

GSM/GPRS Modem-RS232 is built with Dual Band GSM/GPRS engine- SIM900A, works on frequencies 900/ 1800 MHz The Modem is coming with RS232 interface, which allows you connect PC as well as

microcontroller with RS232 Chip(MAX22). The baud rate is configurable from 9600-115200 through AT command.

The GSM/GPRS Modem is having internal TCP/IP stack to enable you to connect with internet via GPRS. It is suitable for SMS, Voice as well as DATA transfer application in M2M interface

The onboard Regulated Power supply allows you to connect wide range unregulated power supply . Using this modem, you can make audio calls, SMS, Read SMS, attend the incoming calls and internet etc. through simple AT command.

Power Supply

Transformer: A transformer is an electro-magnetic static device, which transfers electrical energy from one circuit to another, either at the same voltage or at different voltage but at the same frequency.

Rectifier: The function of the rectifier is to convert AC to DC current or voltage. Usually in the rectifier circuit full wave bridge rectifier is used.

Filter: The Filter is used to remove the pulsated AC. A filter circuit uses capacitor and inductor. The function of the capacitor is to block the DC voltage and bypass the AC voltage. The function of the inductor is to block the AC voltage and bypass the DC voltage.

Voltage Regulator: Voltage regulator constitutes an indispensable part of the power supply section of any electronic systems. The main advantage of the regulator ICs is that it regulates or maintains the output constant, in spite of the variation in the input supply.
The high demand of automobiles has also increased the traffic hazards and the road accidents. Life of the people is under high risk. This is because of the lack of best emergency facilities available in our country. An automatic alarm device for vehicle accidents is introduced in this project. This design is a system which can detect accidents in significantly less time and sends the basic information to the first aid centre within a few seconds covering geographical coordinates, the time and angle in which a vehicle accident had occurred. This alert message is sent to the rescue team in a short time, which will help in saving the valuable lives. A switch is also provided in order to terminate the sending of a message in rare cases where there is no casualty, this can save the precious time of the medical rescue team. When the accident occurs the alert message is sent automatically to the rescue team and to the police station. The message is sent through the gsm module and the location of the accident is detected with the help of the gps module.
This application provides the optimum solution to poor emergency facilities provided to the road accidents in the most feasible way.

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ANALYSIS AND FINDINGS

There are plenty of driving and safety tips out there to help prevent accidents, but as long as human judgment is behind the wheel, there will always be accidents on the road. This is where tech comes in.

New technology is helping to make up for human error via sensors, automatic braking, smartphone connectivity, and more. Here is some of the latest tech we're hoping to see more of in the next few years. Many of these are not only safer but also more convenient for you, the driver.

Adaptive cruise control

Instead of keeping your car at the same speed, adaptive cruise control can adjust speed based on the car in front of you. The radar system maintains a certain distance between you and the car in front of you. No more setting and resetting your speed whenever traffic slows. Acc has been around for a while but has previously only been available in luxury vehicles, like the lexus ls430, which was first to use it. Now, acc is becoming increasingly available in new vehicles.

Anti-collision warning systems

These monitors can detect when a collision is about to happen, allowing the driver to correct the car and avoid an accident. Some even brake for you.

Head-up displays

this display keeps the info you need within your line of sight while driving. Many are customizable so you can put the information that's most important to you on the display, and take off the things that aren't important. This isn't new tech – head-up displays have been long used in fighter jets. But they are now an affordable safety addition to your vehicle.

Steering avoidance systems

Like anti-collision monitors, this system will detect debris on the road and steer to avoid it. This can also keep your car centered in the lane. Braking anti-collision systems are incredibly valuable, but braking won't always prevent an accident. This takes that protection to the next step.

Pre-safe sound

This is currently only available in newer mercedes models, but could save your life. The cabin produces a sound at a frequency that prepares your ears for the loud sound of a collision. This doesn't help with the initial crash, but once the crash is over, you may still be in harm's way. The noise of the crash can hurt your inner ear and be disorienting, but with pre safe sound, you'll have more control and be able to react to get yourself (and your family) safely out of the way.

App vehicle control

Available on some brands, smart-phone integration allows you to control different aspects of your vehicle. Some allow for remote start, parking and monitoring of the vehicle. Perhaps most useful is the ability to check if you locked your car, and locate it, from afar. Tesla's version even monitors the charge of your battery.

Uptis airless tires

Gm and michelin have created a tire that can't go flat. The tires have a series of rubber internal spokes that give the tires their shape instead of air. The companies expect these tires to have a longer life expectancy, to absorb shock better, and eliminate the danger of a flat or blowout on the road.

Vehicle-to-vehicle communications

V2v communication will allow vehicles to detect the behavior of other cars on the road. It will be able to detect when cars have slowed down ahead, when there's a car you cannot visibly see, and detect an oncoming vehicle if you're trying to pass on a two-lane highway. The benefits of v2v are numerous, and add another layer of safety to blind spot detection and anti-collision monitoring. The problem is that v2v is complicated. It will have to be government regulated, and there is some dispute over whether the communications should be via cellular-based 5g or dedicated short-range radio communication (dsrc). While this might make us wait longer than we hoped, v2v will be a major game changer when it gets off the ground.

Automatic car accident detectors use a combination of sensors, machine learning algorithms, and artificial intelligence to analyze data from a vehicle's surroundings and detect when an accident occurs. Some of the most common types of sensors used in these systems include accelerometers, gyroscopes, and cameras.

The data collected by these sensors is processed by machine learning algorithms that are trained to identify patterns and anomalies that may indicate an accident has occurred. For example, sudden changes in speed, direction, or vibration can all be signs of a collision. Additionally, these algorithms may analyze data from multiple sensors to determine the severity and location of the accident.

Once an accident has been detected, the system can take a number of actions. These may include alerting emergency services, notifying the vehicle owner, and activating safety features such as airbags and seatbelt tensioners. In some cases, the system may also be able to provide real-time updates on the status of the vehicle and the condition of its occupants.

Overall, automatic car accident detectors have the potential to significantly improve road safety and reduce the number of injuries and fatalities resulting from car accidents. However, it's important to note that these systems are not foolproof and may not detect all accidents. Additionally, false positives are possible, which could lead to unnecessary alerts and interventions. Therefore, further research and development is needed to refine these systems and make them more accurate and reliable.

Automotive collision avoidance systems prevent imminent crashes by receiving inputs from the environment and adapting accordingly. They take control and perform functions that are difficult for drivers in complex situations. They use sensors and cameras to collect data and process it through controller units. These units send signals to drivers to alert them about concerns that increase the risk of collision and injury, both regarding their driving and other's driving.

Various initiatives by governments of different countries to improve the safety systems onboard a car are being considered major growth factors.

The collision avoidance sensors market size, market characteristics, and market growth of the industry are detailed in this study, which is divided into types, applications, and consumption areas. The research also describes the major firms and introduces players in the industry from the standpoint of the industry chain and marketing chain.

Europe accounted for the largest share of the collision avoidance systems market in 2014, followed by north america and asia-pacific. However, the market is expected to grow at the highest rate, followed by asia-pacific between 2015 and 2020. The collision avoidance system market in asia-pacific regions is expected to be driven by the increasingly stringent regulations regarding installation of collision avoidance systems. Automotive and construction & mining sectors are expected to drive the market for collision avoidance systems during the forecast period.

CONCLUSION

In modern cities, the volume of vehicles has increased dramatically in recent years. This increased traffic has resulted in an increase in the number of accidents. While there exist a number of accident detection systems being brought to market, still a significant number of fatalities arise. At least part of this problem is due to the lack of a timely response to serious accidents, caused by inadequate automatic accident detection and inefficient notification and routing of emergency response. The lack of availability of effective systems, for affordability and retrofitting capability issues, only exacerbates the problem. To address these issues, we propose an iot-based system for accident detection. We have shown that using a variety of different sensors can help in detecting a road accident more accurately. The proposed system immediately detects the location of an accident and calculates the nearest hospital and sends an emergency request for assistance to the required hospital department. We have demonstrated that our proposed approach reduces the number of false alarms seen in earlier work. Our system requires internet connectivity to function. The limitations of our study include that we have conducted the primary evaluation of the system in a simulated environment. In the near future, we will enhance the system by introducing mobile edge computing to reduce latency and enhance security and privacy. Indeed, the system requires a full security and privacy analysis, and we intend to address this in future work.

There are plenty of driving and safety tips out there to help prevent accidents, but as long as human judgment is behind the wheel, there will always be accidents on the road. This is where tech comes in.

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Related experimental work and experts' suggestions have been considered in the troubleshooting part and we can say that the proposed system would work well in various situations. The detection part can detect the accident and collisions accurately with the help of three sensors used and the software application can send the notification to rescue service rapidly using GSM and GPS modules. Thus, the developed system can be of tremendous help in critical situations of accidents. Using this kind of systems in vehicles, we can reduce the death rate due to road accidents.

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