

Accident Prevention: A Review

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Abstract: By knowing psychological ailment of drivers, fatal road accidents can be readily prevented. Due to the drowsiness of car drivers, most road coincidences occur thru driving. This document offers head motion that alerts the topic in the dark state. This system is grounded on subject's psychological state is helpful in warning drivers during the original sleep cycle drowsiness stage by tracking head motions. The subject's physiological sleep state assessment may be resolute using an accelerometer to monitor head motion. If he/she falls asleep, he/she will be wakened by an alarm. Sensors enabled by an Internet of Things are used to communicate all information gathered by sensors over a smart grid network for rapid response team to take action under emergency circumstances. Recently, there have rapidly increasing injuries. Each hour there are about 17 injuries. Bike accidents are one biggest component of all incidents, since there are not as many safety criteria in four-wheelers as in two-wheelers. The explanations may be that it doesn't have a cask, that it has drowsiness, that it has alcohol drunk, that two cars get nearer without the two passengers, that the traffic signals split, that there is no valid or no driving licenses that the driver is reckless, that the acceleration button requested, and so on.

Keywords: GPS, LCD display, PIC microcontroller, alcohol sensor, MEMS sensor, Limit switch.

INTRODUCTION

About 1.35 million people die annually as a significance of road accidents as illustrated in Figure 1. It is highly predicted that this paper is based on the adaptive driving safety aid method of Driver's psychosomatic condition to decrease traffic accidents. Drowsiness is known as a key risk factor contributing to more serious road hazards. When a driver falls into a drowsy state, it can happen in the fluctuating heartbeat and eye movement.



Figure 1: Road Accidents

When driver goes into a drowsy state, the heart beat and the eye movement fluctuate. Heart rhythm measured by electrocardiogram (ECG). Heart ratio variance (HRV) was then determined by the ECG

waveform maximum entropy. A CCD camera with an infrasound ray was used to film the look orientation and the eyelid closure. This study believed that simultaneous measurements of both HRV & blink period can be beneficial to notice lethargy in real-time. The challenge is to decrease quantity of injuries.

For which, action is better before an accident happens as displayed in Figure 2. It's not in our possession often, though. And many wounded lose their lives because they have not previously told. The best solution would be an integrated smart machine. In the event of an accident, the current solution assists travelers. The injured person must activate the machine manually to ask for help. But if he/she was under severe or extreme non-vital circumstances it would not have possible. In order to prevent automated alerting accidents, there is none system to control vehicle speed. This approach is an advanced IoT-based system. This platform does not need any contact between users when driving or in the accident.



Figure 2: Result of Ignorance on Road

This automatically gives the driver a real-time warning of the vehicle's speed. This detects and records all injuries. This may be employed for vehicle accident avoidance. This paper's key contributions include:

- Designing a new intelligent Android-based solution that will reduce traffic accidents.

- To provide the population with the appropriate warning to the death rate.
- After reaching a critical position, to use a speed control mechanism to slow down the speed.
- Implementation of a driver awareness alert system.
- Observation of vehicle gap to barriers.

RELATED WORKS

The portion overlooks similar existing systems and looks at their advantages. Most devices are used to track injuries only. There is no device to both effectively prevent and track injuries. A device that detects a vehicle accident by using vibratory sensing has been developed and will transmit a warning dispatch to police room to evacuate the vehicle employing GSM & GPS modem. No accident management system exists in this system. [1]

An IoT Solution to Detect, Report and Navigate Vehicles has introduced a rescue mechanism through the rescue process by reporting the accident site with further details. A device for detecting alcohol and avoiding accidents in cars used an instrument for detecting alcohol gasses and send messages to relatives locally. This method is valuable not for the overall identification and avoidance of injuries but particular uses. [2]

This article presents a device with the capability of detecting incidents based on a speed controlled system and transmitting the warning to police stations. The monitoring systems employ GPS, &GPRS &GSM technology. Vehicle speed is tracked by GPS and compared. There is no warnings to prevent accidents in this framework. Internet review of the vehicle-based safety warning and tracking system. Studies & implementation.[3]

PURPOSED SYSTEM

This paper suggests a new system to prevent collisions b/w lorries if necessary. The program also notifies authority when an accident occurs. This tracks the car to collect information about the distance between two vehicles. For quantity distance, the ultrasonic sensors are used as illustrated in Figure 3. Each second this calculation is modified. In addition, it is shown via an interface to the driver. Grounded on convinced

conditions, such as secure, slow down and violation, the device sends a warning to the driver. [4]

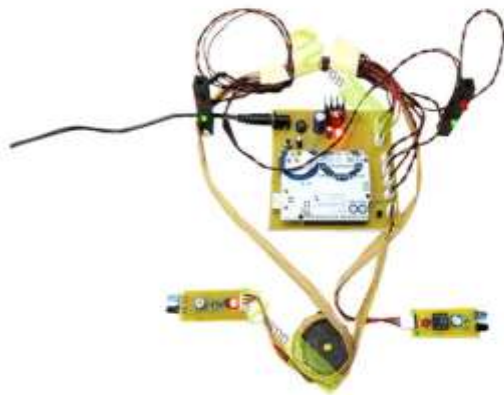


Figure 3: Purposed System in this Paper

The warning is activated in the auto when two vehicles come near. Caution is shown on the yellow led warning. The machine continuously displays the distance from the controller between two vehicles. Alarms warn the driver and distance measurement estimates threat of collision. The system stops the brakes on the car or adjusts its equipment to measure down by a servo engine when the gap between two vehicles is large and the driver does not respond. If a coincidence arises, device would hypothetically send a warning e-mail to release authority with information of car. [5]

COMPONENTS USED

Raspberry Pi:

Raspberry-pi is device of small size, often used effectively in many science and non-scientific fields. Tinker, designers and electronics enthusiasts for projects that involved more than one simple microcontroller (such as Arduino devices), will easily embrace it. It has incorporated WI-FI that makes IOT easier.

Ultrasonic Feeler:

Ultrasonic feelers use ultrasonic waves to measure the distance. The head releases an ultrasonic upsurge & gets the wave from object that is reflected back. Ultrasound sensors compute distance b/w wave

emission and the wave reception. In this design is used the HCSR04 Ultrasonic Sensor.

Servo Motor:

Servo motorized is a rotating actuator or engine that allows accurate control in angular position, acceleration and speed. This uses a conventional engine which performs dissimilar sorts of operations compared to a regular engine. For the device prototype, the Servo Motor SG90 is used. Nevertheless, researcher have to use more powerful servo motors to handle the function of our vehicles. The design is similar. Thus, without change it can easily be used. [6]

METHODOLOGY

This project includes measuring the motion of the head using the accelerometer positioned on the front of vehicle. It measures the drivers ' angle of tilt in both vertical forward/backward way & direction left/right [4]. The logic circuit will be provided this output to show alarm & the status will be displayed on the LCD [3]. The system with working principle is demonstrated in Figure 4.

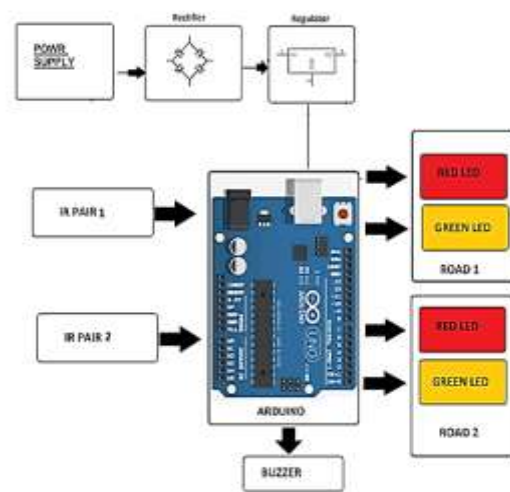


Figure 4: Block Diagram of Accident prevention system

CONCLUSION

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Most portable devices are designed to provide unlimited access to internet facilities to store and synchronize information with other remote devices. Therefore, for real-time apps to make cars safe, automatic, responsive and smart, there is essential for quicker data acquisition and fast decision making of embedded computing system. The interfacing of easy sensors to different micro-controller systems allows for easy regulation of the embedded system at advanced levels of automation and the mediation of sensor information over nifty grid allows for big amounts of data acquisition to make precise choices about emergency circumstances. In this paper, the scientist has done our job, a smart IoT-based system that may assist reduce amount of accidents. Unsurprisingly, our approach provides many benefits over traditional systems. The system is reliable in its efficiency and maintenance. In extra arguments, system is available and operates all day long. The explanation for its robustness is that an IoT system is continuously informed and alert. Authors' idea for prospect is to improve the system so it suits all types of vehicles and models. The system can easily be added to GPS unit that enhances the email alarm system.

REFERENCES

- [1] A. Singhal, Sarishma, and R. Tomar, "Intelligent accident management system using IoT and cloud computing," 2017, doi: 10.1109/NGCT.2016.7877395.
- [2] A. Thakur, R. Malekian, and D. C. Bogatinoska, "Internet of Things Based Solutions for Road Safety and Traffic Management in Intelligent Transportation Systems," 2017, doi: 10.1007/978-3-319-67597-8_5.
- [3] E. Nasr, E. Kfoury, and D. Khoury, "An IoT approach to vehicle accident detection, reporting, and navigation," 2016, doi: 10.1109/IMCET.2016.7777457.
- [4] H. Hamdane, T. Serre, C. Masson, and R. Anderson, "Issues and challenges for pedestrian active safety systems based on real world accidents," *Accid. Anal. Prev.*, 2015, doi: 10.1016/j.aap.2015.05.014.
- [5] S. Yasmin, N. Eluru, A. R. Pinjari, and R. Tay, "Examining driver injury severity in two vehicle crashes - A copula based approach," *Accid. Anal. Prev.*, 2014, doi: 10.1016/j.aap.2014.01.018.
- [6] J. S. Jermakian, "Crash avoidance potential of four passenger vehicle technologies," *Accid. Anal. Prev.*, 2011, doi: 10.1016/j.aap.2010.10.020.