

ALERTING SYSTEM FOR ACCIDENT PREVENTION

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ABSTRACT:

It's an absolute miracle to read a newspaper without a accident news nowadays. In the previous year, there were more than 1.50l deaths due to road accidents were registered in our country and the important thing we have to observe in this is 59.7% of fatalities occurred due to over-speeding. If we have the potential to prevent accidents due to over-speeding, then we can avoid most of the accidents. To make this possible, we have an idea that might help. In our idea, we are going to set up a dashboard warning light that lights up with a beep and when a vehicle above certain speed limit(for ex.100km/hr) approaches your vehicle it also shows the direction of the vehicle by using GPS facilities within a certain radius let's say 100 meters if we set this up in every vehicle every driver can drive without any stress as any upcoming danger by any other vehicle can be prevented as it would be notified to the driver beforehand. It can really be helpful to people who are following the traffic rules and still end up in crucial accidents, people who are just trying to travel without any problem.

Keywords :GPS, AI System, vehicles, buzzers, indicators.

INTRODUCTION:

In 2022, 1,55,622 people will die in traffic accidents. Road incidents involving driver loss of control totaled 19,478 in 2021. An estimated 1.3 million individuals each year pass away in automobile accidents. The majority of the time, irresponsible driving and excessive speeding are to blame for these collisions. Almost 66% of these collisions are the result of speeding.

The innocent drivers who are following proper traffic rules are also victims of accidents mostly due to the other reckless drivers. Accidents occur mostly due to the lack of information about the upcoming danger. If they are made aware of the approaching vehicle before they get close causing accidents.

The drivers can move accordingly to prevent them getting into an accident. we are going to set up a dashboard warning light that lights up with a beep when a vehicle above certain speed limit(for ex.100km/hr) approaches your vehicle it also shows the direction of the vehicle by using GPS facilities within a certain radius let's say 100 meters if we set this up in every vehicle every driver can drive without any stress as any upcoming danger by any other vehicle can be prevented as it would be notified to the driver beforehand. Most of the bikes and cars are smart so it should be easy to implement. it can really be helpful to people who are following the traffic rules and still end up in crucial accidents, people who are just trying to travel without any problem.

LITERATURE SURVEY:

In [08] "Cloud based Accident Detection and Notification System", the goal of the project is to create a reliable accident detection and notification system. Accident Detection System is one of the subsystems (ADS). A notification system is an additional subsystem. ADS is implemented on separate hardware, and it is in charge of accidents, accident severity estimate, and impact direction estimation. The system also includes a Raspberry Pi, which serves as the system's main controller and is Bluetooth-connected to the ADS. A GPS-GSM module, a web application connected to a firebase cloud database, and a notification system are

employed. The built web application retrieves the information about the accident when it is received by the cloud database and presents it to emergency authorities.

In [14] “Blackspot Alert and Accident Prevention System”, in order to address the accidents in dark spots, this study provides the design and concept of a mobile application. The development of a GPS-based mobile application to track the user's present location.

Authors	Paper	Components	Applications
Mrs Y. Lavanya, Dr. L .Bharathi, P.Raja, Y .Rajesh, M Sai Swaroop [1]	“Smart Road Safety And Vehicle Accident Prevention for Mountain Roads”	Buzzer, Arduino Microcontroller, IC, Capacitors	Here they used Arduino microcontroller to interface with IR sensor.
Ashutha, Aravinda, Deeksha, Chitralskshmi [2]	“Sensor Based Accident Prevention System”	RF Module, Arduino Uno Microcontroller, Ultrasonic Sensor	In this paper they have concluded that accident prevention in u-turn and silly roads.
R.Saranya, R.Arun Kumar [3]	“Vehicle Movement Control and Avoidance”	GSM Module, GPS Module, Level Controller	Using Drowsiness, Texting while driving these are the main reason for accidents.
Dr Madhu B K, Nikhil U, K Surabhi[4]	“Vehicle Collision Avoidance System”	Bluetooth Module , Hazard Warning, Motor Driver	In this paper the system takes action automatically without any driver input.
P. Swathi, Muzameel Ahmed[5]	“IOT Based Intelligent System For Vehicle Accident Prevention and Detection”	MQ-3 Sensor, Arduino Microcontroller, Accelerometer, Webcam	This Proposed system is efficient, cost- effective and minimizes the number of accidents.
Mubashir Murshed, MD Sanaullah Chowdhury[6]	“Car accident prevention system”	Servo Motor, Raspberry Pi, LED, Buzzer	This system is made of Raspberry Pi to send E-Mail alerts message.

METHODOLOGY/COMPONENT:

We are proposing a system that uses artificial intelligence to detect vehicles that are moving at a high speed and are within a certain distance from your own vehicle. To achieve this,our plan to incorporate a speed and distance detector into our system.

The speed detector in our system will be designed to efficiently detect the speed of vehicles on the road. However, it's important to note that the unit of speed is typically meters per second or kilometres per hour, not meters per second squared. Therefore, detecting vehicles that are moving at a speed of 100 meters per second or more is quite unlikely, as the fastest land vehicle (car) can only reach a maximum speed of around 450 kilometres per hour, which is approximately 125 meters per second.

The distance detector in our system will continuously monitor the distance between our vehicle and other vehicles on the road. It's important to consider the accuracy and precision of the distance measurement, as various factors such as the angle of detection, weather conditions, and obstacles on the road can affect the measurement. Therefore, it's crucial to have a reliable and robust sensor system that can accurately measure the distance between vehicles.

Our proposed AI system will detect vehicles that are moving at 100 meters per second or more and are within a distance of 300 meters from your own vehicle. If such a vehicle is detected, the AI will immediately alert the driver with lights and sounds. However, it's important to ensure that the alert system is not distracting or confusing for the driver. The alert should be designed in a way that it effectively communicates the potential danger without causing any undue stress or panic to the driver.

Overall, to ensure the safety, efficiency, and user-friendliness of our AI system, we are make it sure that the AI we have in our system has the proper set up and execution properties.

For the research work we are using different components those are listed below:

1. Proximity sensor.
2. Red and green light.
3. Indicator.

1. PROXIMITY SENSOR:

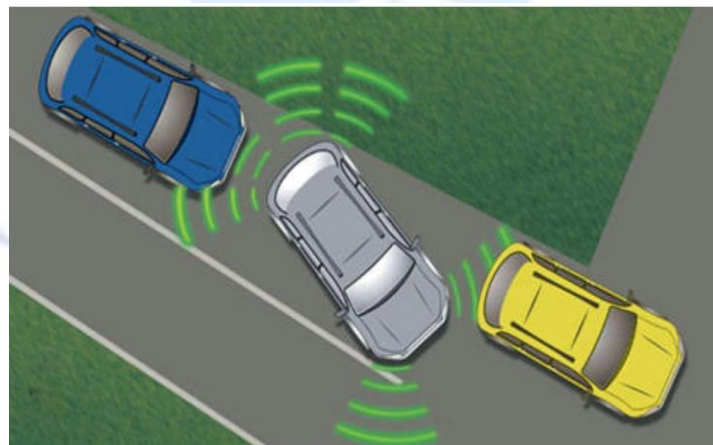


FIG 1: Proximity Sensor

A Proximity sensor is a type of device that can detect the presence of objects without requiring any physical contact. It works by emitting an electromagnetic beam or field and can be used in various applications such as speed alerting systems and in ghat sections. When a vehicle comes close to the sensor, it triggers a response such as activating a white LED light. Essentially, the proximity sensor uses non-contact technology to detect objects in its vicinity and can be a useful tool in a range of scenarios.

2. RED AND GREEN LIGHT:

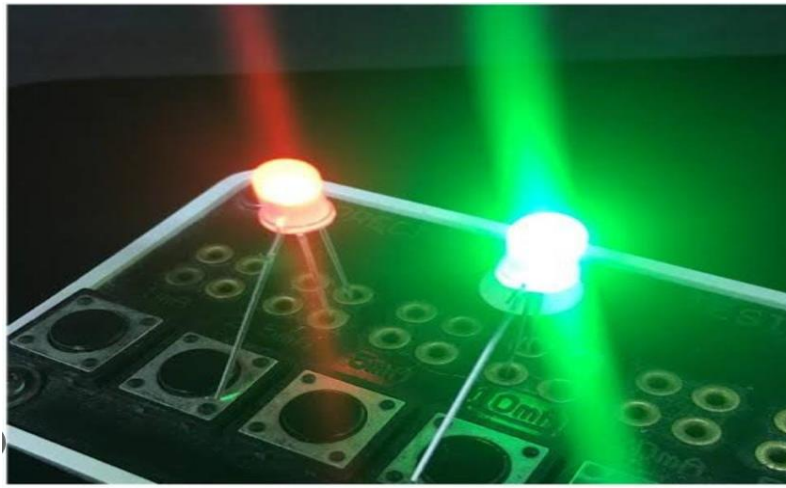


FIG 2:Red and green light

Alert lights, also known as warning lights, are an important safety feature in vehicles. They are used to indicate potential hazards or emergencies to other drivers and pedestrians on the road. There are different types of alert lights, including headlights, tail lights, brake lights, turn signals, and emergency lights. Headlights are used to illuminate the road ahead, while tail lights and brake lights indicate when a vehicle is slowing down or stopping. Turn signals indicate when a vehicle is changing direction, while emergency lights are used in emergency situations, such as when a vehicle is pulled over on the side of the road or when emergency responders are on the scene. Alert lights are essential for promoting safe driving and preventing accidents on the road.

3. INDICATOR:

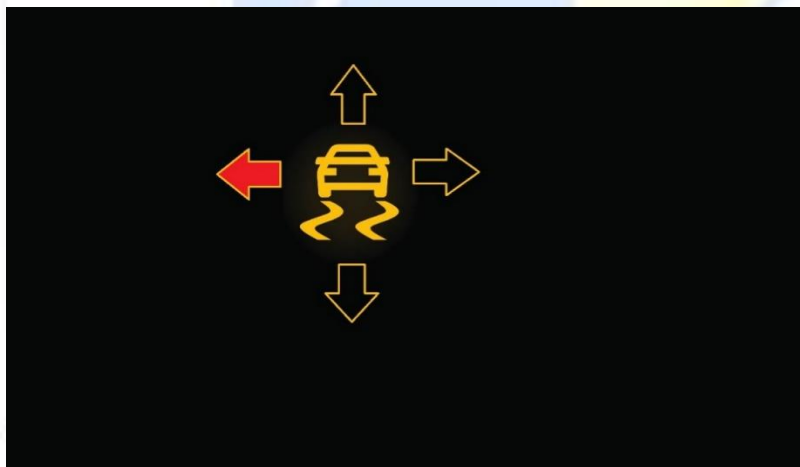


FIG 3:Indicator

Indicators are essential devices used to communicate the direction of a vehicle's intended movement to other drivers on the road. Typically located on the front and rear of a car or other vehicle, indicators are designed to flash on and off to indicate the driver's intent to turn or change lanes. These devices are typically operated through a lever or button located on the steering wheel or dashboard of the vehicle. Depending on the vehicle's design, indicators can be manually or automatically activated when the driver signals their intention to turn or change lanes. By using indicators, drivers can significantly improve the safety of their own vehicle and other drivers around them, making it easier for everyone to anticipate and respond to traffic changes.

FUTURE ENCHANCEMENT:

“Integration of Artificial Intelligence in vehicle for preventing Accident system: Potential Benefits and Challenges”

JUSTIFICATION:

An AI is used to prevent the accident by alerting the driver . Our own vehicle has the AI which has all the necessary programs and alerting system needs . If a vehicle moves towards from us in any direction in the speed of 100km/h or more than that , our AI would notify there is a vehicle in the particular direction with the particular speed . It helps the driver to prevent the accident

The idea of using AI to prevent accidents by alerting the driver is justified by the fact that accidents are a major cause of injuries and deaths on roads worldwide. In many cases, accidents are caused by human error, such as distracted driving or failure to notice other vehicles on the road. AI technology can help mitigate these risks by providing drivers with real-time information about potential hazards on the road.

The use of an AI system in a vehicle to detect the speed and direction of other vehicles on the road is a practical approach to accident prevention. The AI system can monitor the surrounding environment using sensors, cameras, and other technology, and then analyze the data to identify potential risks. When a vehicle is detected traveling at a speed of 100km/h or higher, the AI can alert the driver to the potential danger, giving them time to react and avoid a collision.

Overall, the use of AI to prevent accidents is a promising approach to improving road safety. By providing drivers with real-time information about potential hazards, AI systems can help reduce the number of accidents caused by human error and improve overall road safety for all drivers and passengers.

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RESULT AND DISCUSSION:

The Alerting System showing Red LED is glowing when a vehicle is approaching from the other side and the Green LED glows when vehicle is not passing from the other side. Simultaneously it works when a vehicle is approaching from the other side. It only requires the location feature so it is easy to implement in real life as it does not require any additional physical parts. The previous methods always include a physical component which made it difficult to implement in real life. The only problem that is not tackled in our model is the requirement of GPS and a good internet connection. A bad connection can delay the information which can defeat the purpose of the system itself. The Collision Detection and Warning system alerts the driver when there is chance of collision and it gives visual and audio warning to driver through this driver can avoid the collision and can take necessary actions.

CONCLUSION:

An alerting system for accident prevention can be a valuable tool to enhance safety in transportation. By utilizing GPS the system can detect fast moving vehicles and alert before an accident occurs. However, the effectiveness of the alerting system heavily relies on its accuracy and reliability, which requires proper maintenance and calibration. Additionally, the system should be designed to minimize false alarms, as too many false alarms can lead to complacency and reduce the system's effectiveness. Overall, an alerting system for accident prevention has the potential to significantly reduce the occurrence of accidents and injuries, making traveling safer for everyone.

Funding: “This research received no external funding”

Conflicts of Interest: “The authors declare no conflict of interest.”

REFERENCES:

- [1] Mrs. Y. Lavanya, M. Monika Rani, M. Sai Swaroop, P. Raja, Y. Rajesh, Dr. L. Bharathi “Smart Road Safety and Vehicle Accident Prevention System for Mountain Roads” JAC: A Journal of Composition Theory published in August 2021 volume XIV, Issue VIII ISSN:0731-6755.
- [2] Aravinda Chaithralakshmi, Deeksha, Ashuthos “Sensor Based Accident Prevention System” International journal of innovative research in electrical, electronic and instrumentation and control engineering Vol 4, Issue 6, June 2016.
- [3] R. Srayana, R. Arun Kumar “Vehicle Movement control and Accident Avoidance in hilly track” International Conference on Electronics and Communication Systems (ICECS) published in sept 8 2014.
- [4] Dr. Madhu b K, Karthk Koti, K Surabhi, Nikhil U, Yashwanth M “Vehicle Collision Avoidance System” International Research Journal of Engineering and Technology {IRJET} Vol 7, Issue 06 June 2020 e-ISSN: 2395-0056.
- [5] Publisher: IEEE International Conference on Intelligent Computing and Control Systems (ICICCS) INSPEC Accession Number: 17487357, DOI:10.111109/ICCONS.2017.8250761 Published on 2017.
- [6] Mubashir Murshed and MD Sanaullah Chowdhury “IOT Based Car Accident Prevention And Detection System with Smart Brake Control” Procs. Of International Conference on Applications and Techniques in Information Science (iCATIS2019) 19 January 2019.
- [7] World Health Organization, “Save LIVES- A road Safety Technical package,” 2017.
- [8] M. Sumithra and Dr. S. Malathi, “A Novel Distributed Matching Global and Local Fuzzy Clustering (DMGLFC) FOR 3D Brain Image Segmentation for Tumor Detection”, IETE Journal of Research, doi.org/10.1080/03772063.2022.2027284, 2021.

[9] B.Buvanswari and T.Kalpalatha Reddy, "A Review of EEG Based Human Facial Expression Recognition Systems in Cognitive Sciences" International Conference on Energy, Communication, Data analytics and Soft Computing (ICECDS), CFP17M55-PRJ:978-1-5386-1886-8", August 2017.

[10] M. Sumithra and Dr. S. Malathi, "Modified Global Flower Pollination Algorithm-based image fusion for medical diagnosis using computed tomography and magnetic resonance imaging", International Journal of Imaging Systems and Technology, Vol. 31, Issue No.1, pp. 223-235, 2021.

[11] K. Sridharan, and Dr. M. Chitra "SBPE: A paradigm Approach for proficient Information Retrieval, Jokull Journal", Vol 63, No. 7; Jul 2013.

[12] M. Sumithra and Dr. S. Malathi, "3D DenseNet Model with Back Propagation for Brain Tumor Segmentation", International Journal Of Current Research and Review, Vol. 13, Issue 12, 2021.

[13] B.Buvaneswari and Dr.T. Kalpalatha Reddy, "EEG signal classification using soft computing techniques for brain disease diagnosis", Journal of International Pharmaceutical Research, ISSN : 1674-0440, Vol.46, No.1, Pp.525-528, 2019.

[14] K. Sridharan, and Dr. M. Chitra "Web Based Agent And Assertion Passive Grading For Information Retrieval", ARPN Journal of Engineering and Applied Sciences, VOL. 10, NO. 16, September 2015 pp:7043-7048.

[15] M. Sumithra and Dr. S. Malathi, "Segmentation Of Different Modalities Using Fuzzy K-Means And Wavelet ROI", International Journal Of Scientific & Technology Research, Vol. 8, Issue 11, pp. 996-1002, November 2019.

[16] M. Sumithra and S. Malathi, "A Survey of Brain Tumor Segmentation Methods with Different Image Modalities", International Journal of Computer Science Trends and Technology (IJCSST) – Vol. 5 Issue 2, Mar – Apr 2017.

[17] B.Buvaneswari and Dr.T. Kalpalatha Reddy, "High Performance Hybrid Cognitive Framework for Bio-Facial Signal Fusion Processing for the Disease Diagnosis", Measurement, ISSN: 0263-2241, Vol. 140, Pp.89-99, 2019.

[18] M. Sumithra and Dr. S. Malathi, "A Brief Survey on Multi Modalities Fusion", Lecture Notes on Data Engineering and Communications Technologies, Springer, 35, pp. 1031-1041, 2020.

[19] M. Sumithra and S. Malathi, "A survey on Medical Image Segmentation Methods with Different Modalities", International Journal of Engineering Research and Technology (IJERT) – Vol. 6 Issue 2, Mar 2018.

[20] B.Buvaneswari and Dr.T. Kalpalatha Reddy, "ELSA- A Novel Technique to Predict Parkinson's Disease in Bio-Facial", International Journal of Advanced Trends in Computer Science and Engineering, ISSN 2278-3091, Vol.8, No.1, Pp. 12-17, 2019.

[21] K. Sridharan, and Dr. M. Chitra, Proficient Information Retrieval Using Trust Based Search On Expert And Knowledge Users Query Formulation System, Australian Journal of Basic and Applied Sciences, 9(23) July 2015, Pages: 755-765.

[22] B.Buvaneswari and Dr.T. Kalpalatha Reddy, "ACPT- An Intelligent Methodology for Disease Diagnosis", Journal of Advanced Research in Dynamical and Control Systems, ISSN : 0974-5572, Vol.11, No.4, Pp.2187-2194, 2019.

[23] Sumithra, M., Shruthi, S., Ram, S., Swathi, S., Deepika, T., "MRI image classification of brain tumor using deep neural network and deployment using web framework", Advances in Parallel Computing, 2021, 38, pp. 614–617.

[24] K. Sridharan, and Dr. M. Chitra "RSSE: A Paradigm for Proficient Information Retrieval using Semantic Web", Life Science Journal 2013;10(7s), pp: 418-425