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Intelligent Vehicle Communication for Prevention of Road Accident

B.Jaiganesh[1], Abdul Kadi A[2], Abivinayak MS[3], Naveen D[4]

Assistant professor, Dept. of ECE, RMD Engineering College, Gummidipoondi, Tamilnadu, India[1]

B.E Student, Dept. of ECE, RMD Engineering College, Gummidipoondi, Tamilnadu, India[2]

B.E Student, Dept. of ECE, RMD Engineering College, Gummidipoondi,Tamilnadu, India[3]

B.E Student, Dept. of ECE, RMD Engineering College, Gummidipoondi, Tamilnadu, India[4]

ABSTRACT: The vehicle to vehicle communication (V2V) technique has been proposed to meet the road safety. Accidents have become one of the leading causes for death. This led to the motivation to reduce the number of accidents and thus provide safety to the passengers in the vehicle. There is a need of wireless communication for the realization of safe road environment. This system is proposed to provide safety for the passenger, to ensure the prevention of accident on roads and to send the message to the nearest vehicle in case of emergency. A wireless communication like ZigBee technology is used for vehicles to prevent the accidents. The proposed system uses different sensors which improves the vehicle and passenger safety.

KEYWORDS*:* V2V communication, passenger safety, ZigBee technology

I.INTRODUCTION

In this project the wireless data communication is provided by using ZIGBEE concept, this ZIGBEE technology is a high level wireless communication protocol using small and low power based wireless networks. In this system, a new technology is implemented, where the driver can run the vehicle only after submitting the license to the car. Here we are using RFID tag as license once reader reads the tag then the controller will store driver details and then only will allow the driver to run the vehicle. An alcohol sensor is used to check whether the driver has consumed alcohol or not. If the driver has consumed alcohol, then the controller will turn on the light indicating mechanism to alert the nearby vehicle. A new system is implemented when the vehicle hits an object and all the information is shared to a nearby vehicle with all the necessary data about the damage to the vehicle. Accidents will be detected based on the vibration sensor and the controller will transmit data to the nearby vehicle to seek for help in case of an emergency situation. The normal vehicle will be automatically changed as emergency vehicle with the help of IOT. When the driver presses the emergency switch, then the emergency data will automatically be updated to the web server page to which the authority will give a permission to that vehicle to change as emergency vehicle. By using this mechanism, features can be provided to the customers. Hence it aims at not only reducing, but avoiding accidents in whole

II.LITERATURE SURVEY

According to automotive telematics, modern vehicles are expected to be connected through heterogeneous radio access technologies and are able to exchange massive information with their surrounding environment. By significantly expanding the network scale and conducting both real-time and long-term information processing, the traditional Vehicular AdHoc Networks (VANETs) are evolving to the Internet of Vehicles (IoV), which promise efficient and intelligent prospect for future transportation system. On the other hand, vehicles are not only consuming but also generating a huge amount and enormous types of data, which is referred to as Big Data. This method deals with investigating the relationship between IoV and big data in vehicular environment, on how IoV supports the transmission, storage, computing of the big data, and how IoV benefits from big data in terms of IoV characterization, performance evaluation and big data assisted communication protocol design. Then the application of IoV big data in autonomous vehicles is determined.

Dedicated Short Range Communication (DSRC) has been considered as a promising wireless technology for enhancing transportation safety and traffic efficiency. According to this method, both line-of-sight (LoS) and non-line-of-sight (NLoS) durations follow power law distributions, which implies that the probability of having long LoS/NLoS conditions can be relatively high. Second, the packet inter-reception (PIR) time distribution follows an exponential distribution in LoS conditions but a power law in NLoS conditions. Third, the overall PIR time distribution is a mix of

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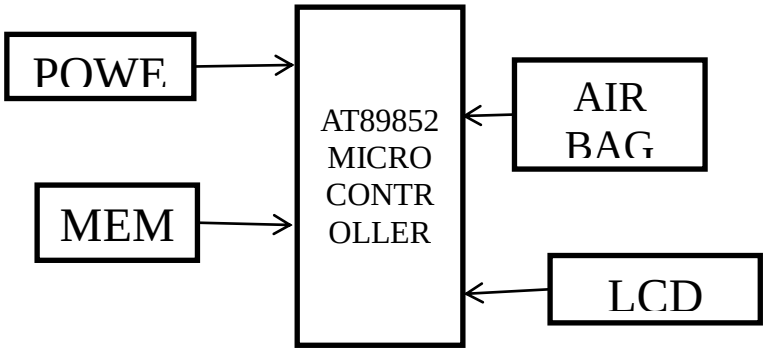
exponential distribution and power law distribution. The presented results provide solid ground to validate models, tune VANET simulators and improve communication strategies.

Embedded systems with advanced sensors, cameras and processors in automated driving vehicles are capable of sensing the environment and conducting automobile operation, paving the way to modern intelligent transportation systems (ITS) with high safety and efficiency. On the other hand, vehicular communication networks (VCNs) connect vehicles, infrastructures, clouds, and all other devices with communication modules, whereby vehicles can obtain local and global information to make intelligent operation decisions. However, their interactions and mutual benefits are still underdeveloped. This can be improved considering that traffic jam can be relieved at intersections with automated driving vehicles coordinated with each other through VCNs.

In vehicular ad hoc networks (VANETs), cellular vehicle-to-everything (C-V2X) is an emerging technology for communications between vehicle-to-infrastructure, vehicle-topedestrian, and vehicle-to-network which improves traffic efficiency, road safety, and the availability of infotainment services. Herein, a novel V2V-enabled resource allocation scheme based on C-V2X technology is proposed to improve the reliability and latency of VANETs. Particularly, a hybrid architecture is proposed, where the V2V links are controlled by the cellular eNodeB in the overlay scheme. In this scheme, every vehicle periodically checks its packet lifetime and requests the cellular eNodeB to determine V2V links. The optimum resource allocation problem at the cellular eNodeB is to choose optimum receiver vehicles to determine V2V links and allocate suitable channels to minimize the total latency. This problem is equivalent to the maximum weighted independent set problem (MWIS-AW) with associated weights, which is NP-hard. In order to compute the weights, an analytical approach is developed to model the expected latency and packet delivery ratio. Moreover, a greedy cellular-based V2V link selection algorithm is proposed to solve MWIS-AW problem and develop a theoretical performance lower bound. Simulation results show that the proposed scheme significantly outperforms the existing schemes in terms of latency, throughput, and packet delivery ratio.

III.EXISTING METHOD

The immediate safety mechanism available in vehicles to ensure passenger safety is the air-bag system which inflates the air-bags to protect the passenger from major injuries. However, this too happens only after the accident has occurred. Airbags also sometimes won't work. Furthermore, when some other object hits an airbag, it may even result in death. It is also noted that no actions are performed to control or avoid the pollution caused by the vehicles. Air bags pose a potential risk for passengers who are shorter in height than average heighted people. In addition, air bags do not replace the need for seat belts.



IV.PROPOSED METHOD

In the proposed system, a new technology is implemented in vehicle to vehicle communication. In this system, the driver can run the vehicle only after submitting the license to the car. Here, an RFID tag as license is used. Once the reader reads the tag, the controller will store driver details and then only will allow the driver to run the vehicle. In addition, an alcohol sensor is used to check whether the driver has consumed alcohol or not. If the driver has consumed alcohol, then the controller will turn on the light indicating mechanism to alert the nearby vehicle. Accidents will be detected based on the vibration sensor and the controller will transmit the data to the nearby vehicle to seek for help in case of emergency situation. The normal vehicle will be automatically changed as emergency vehicle with the help of

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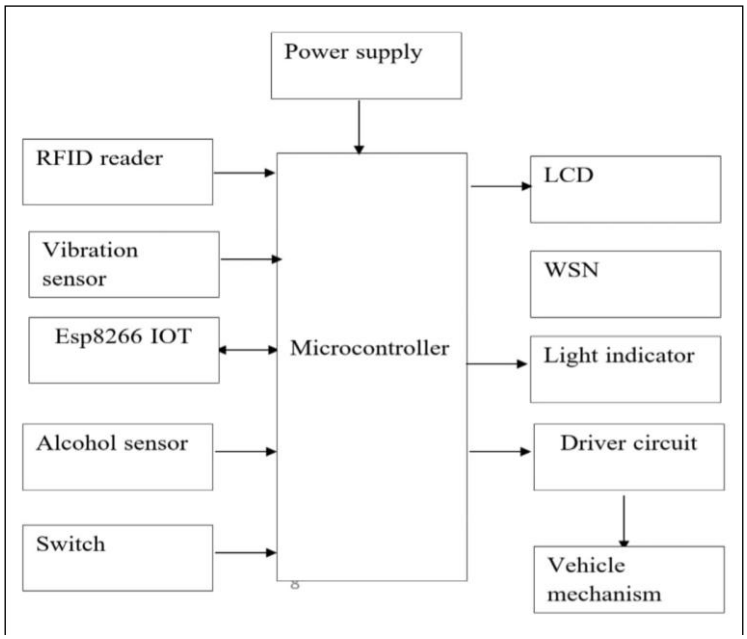
IOT. Furthermore,when the driver presses the emergency switch, then the emergency data will automatically be updated to the web server page to which the authority will give a permission to that vehicle to change as emergency vehicle. By using that we can provide features for the vehicle to the customers. All the details will be displayed in the LCD.



V. RESULT AND DISCUSSION

In the proposed system, a new technology is implemented on vehicle to vehicle communication. By using this more we can provide a wide range of features in the vehicle to the customers. The display of essential details will be displayed in a LCD for easier access and understanding can be implemented in the future.

VI.CONCLUSION

The proposed system aims to improve the vehicle safety and the passenger safety. To keep the drivers aware of the faults, different sensors have been used to reduce the number of accidents along with providing safety to the passengers in thevehicle.Also,it provides safety to the passenger and prevents accident on road. In case of emergency, the proposed system sends the message to the nearest vehicle.The normal vehicle will be automatically changed as emergency vehicle with the help of IOT. When the driver press the emergency switch then the emergency data will automatically updated to the web server page then the authority will give a permission to that vehicle to change as emergency vehicle.

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