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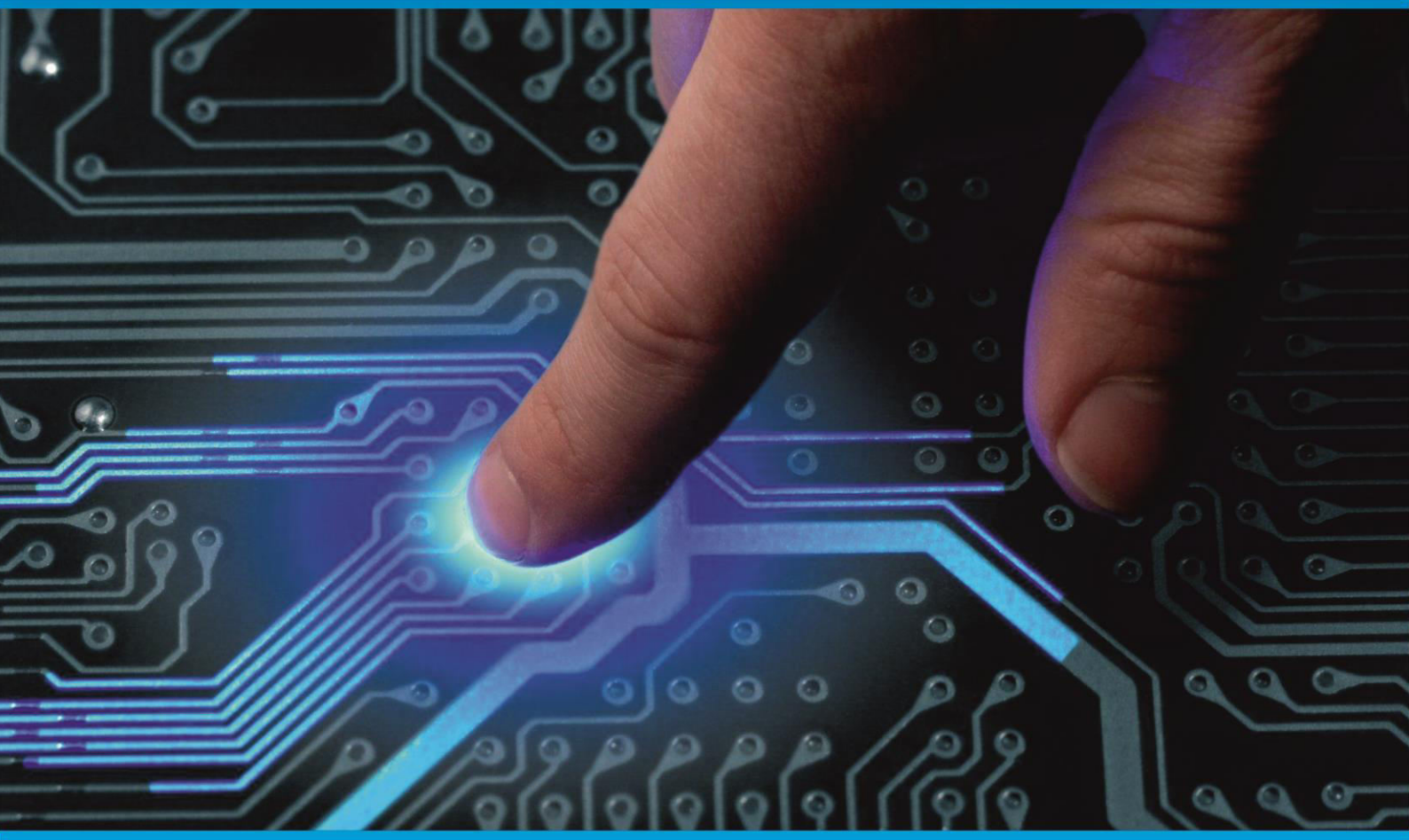

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The Future of Connected Vehicles

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ABSTRACT: The vehicle capable of access to the Internet, communicating with intelligent devices as well as other vehicles and road infrastructure. These vehicles capable of collecting real-time data from multiple sources and processing that data with some algorithms or from previous data collected by a vehicle. It is likely to play a necessary role in the predictable internet of things (IOT). Today's vehicles require people's intervention, which results in increase traffic fatalities. To avoid traffic and jeopardizing people, vehicles have been asking to relieve drivers from the most stressful functions needed for driving, providing them with intriguing and updated entertainment functions. In the meantime, they have to comply with the increasingly strict standards about safety and reliability. It will not only affect on safety but also on achieving long distance in short interval, even in that short interval we can do other things while vehicle doing his job. It will change all vehicle manufacturing industries. It will also affect on infrastructure like, as vehicle communicate with each other, only the efficient space will get occupied. Transportation vehicles will transport material without human intervention, it will save the cost of company of drivers. Unlike human, transportation vehicles will work 24 hours seamlessly.

KEYWORDS: IOT, jeopardize, intriguing, seamlessly, real-time

I. INTRODUCTION

By communicating vehicles with one another it will help in reduce traffic fatalities and also help in improving the safety and security of drivers as well as vehicles. To communicate with each other requires a data transfer rate in Giga bites per second which will not possible with the 4G network. with the advent of 5G, it might be possible to transfer data faster than the current 4G LTE. Which will help in taking the decision in a second. There is another technology that is popular and which might be efficient, is Wi-Fi-based technology. There is a debate going on about which technology is better, the WIFI DSRC(Dedicated Short Range Communication) or the 5G CV2X. But 5G which have higher bandwidth and with its low latency it will possible to use CV2X in upcoming automotive industries. Although the near future will be affected by Cellular Autonomous Vehicles, current challenges continue to postpone the public implementation of this technology. The CAV uses a wi-fi network and sensors to obtain relevant traffic and other vital information while its driving control is regulated by some levels of automation. Level 1 requiring complete human driving interaction and level5 being full autonomous navigation without human interaction. As an astonishing asset to have in driver assistance, level 5 makes use of technology that relieves drivers from navigation responsibilities.

II. TECHNOLOGY

A. *Vehicle-to-Everything:*

Vehicle-to-everything (V2X) may be a technology that permits vehicles to speak with moving parts of the traffic system around them. Also referred to as connected-vehicle to-everything communication, it's several components. One component of this technology is named vehicle-to-vehicle (V2V) which allows vehicles to speak with each other. Another component is vehicle to infrastructure (V2I) which allows vehicles to speak with external systems like street lights, buildings, and even cyclists or pedestrians. As this technology becomes more sophisticated within the future, what it's capable will also get expand.

B. *Vehicle-to-Pedestrian:*

Making on the knowledge gained from earlier V2P research, the team developed a versatile assessment plan to investigate the safety effectiveness of market-ready V2P technologies and document their strengths and limitations. The plan includes selecting a V2P system with eligibility criteria for testing, the test cases under which the system

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should be evaluated, and the performance criteria for evaluating those systems. Selected systems are required to perform in at least one of the chosen test cases, provide a measurable communication output to the pedestrian, cyclist, and/or driver, function within the environment provided (either at the Pedestrian Technology workplace or off-site), and have proper installation validated by the research team. Four test cases representing the bulk of scenarios in which pedestrian-vehicle collision fatalities occur are outlined in the assessment plan:

- Straight: A vehicle is traveling straight, on a straight road, and a pedestrian/cyclist makes a perpendicular crossing.
- Parallel: A vehicle is traveling straight, on a straight road, and a pedestrian/cyclist is traveling straight along the roadway.
- Left Turn: A vehicle attempts a left turn at an intersection while a pedestrian/cyclist attempts a straight path roadway crossing.
- Right Turn: A vehicle attempts a right turn at an intersection while a pedestrian/cyclist attempts a straight path roadway crossing.

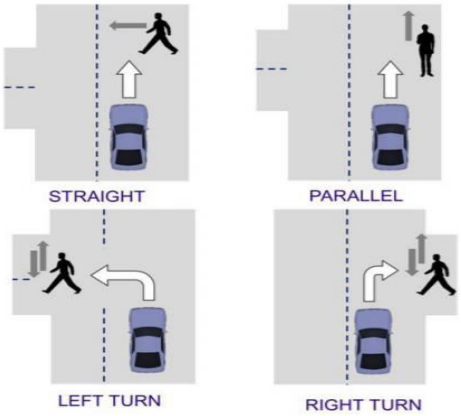

Fig.1. Pedestrian Detection

C. *Vehicle-to-Vehicle:*

The radio system for the V2V Communication springs from the quality V2X communication. As soon as two or more vehicles are in radio communication range, they connect automatically and establish an ad hoc network. because the range of one link is restricted to a couple of hundred meters, every vehicle is additionally router and allows sending messages over multiple hop to farther vehicles. The routing algorithm is based on the position of the vehicles and is during a position to handle fast changes of the unplanned topology. For example, there's oil on the express highway and therefore a vehicle got slip thanks to it, this movement is caught by the system and emergency warnings are send to other vehicles about the danger, it even controls the speed of the vehicle to avoid accident. With vehicle-to-vehicle communication not only the transportation speed will increase but it'll also trying to mitigate the road accidents. With vehicle-to-vehicle communication you'll also improve the efficiency of fuel by selecting the economic lane where all vehicles will travel with speed which is useful for environment.

D. *Vehicle-to-Infrastructure:*

Vehicle-to-infrastructure (V2I or v2i) could even be a communication model that permits vehicles to share information with the components that support a country's transportation. Such components include overhead RFID readers and cameras, traffic lights, lane markers, streetlights, signage, and parking meters. V2I communication is usually wireless and bi-directional: data from infrastructure components are often delivered to the vehicle over a billboard hoc network and thus the opposite way around. almost like vehicle-to-vehicle(V2V) communication, V2I uses dedicated short-range communication (DSRC) frequencies to transfer data. Vehicle-to-Infrastructure communication also will help in securing your vehicles from theft. For example, after vehicle dropping you

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somewhere it'll search for the closest parking lot to travel there without human intervention. Same ways it'll also get summon by using mobile device so as that you simply do not waste a while to visit the parking lot.

III. CONCLUSION

This paper shows that how intelligent vehicle technologies can improve operational performance on road links and intersections leading to increased mobility and improved operations. Many simulations have been run showing that CVs and AVs can improve roadway capacity, stabilize traffic during congestion periods, and reduce delays at signalized intersections. However, more research is required on AVs to work out the trade-off between capacity improvement and occupant comfort, and so as to completely comprehend mobility data needs and requirements. CV technology will provide increased capacity of existing transportation networks, in addition to increased roadside safety for motorists through the development of an overall Intelligent Transportation System (ITS) preliminary trials, and implementation of those communication technologies amongst vehicles and infrastructure has proven to supply greater benefits which will only improve as time progresses. These concepts will help to enhance roadside safety through communicating with other vehicles and also relaying this information through the roadway network allowing a chance for communication between a centralized traffic management system and motorists. The future of this technology will help to revolutionize the automotive world, traffic engineering design, and management practices in the near future.

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