

LTD2 vehicle driving System

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Abstract: In this paper we provide vehicle driving system based on LTD2 (Listen, Topology Distance-two- protocol and Distributed System) provides anti-collision system for vehicle driving. Which always listen the position of other vehicle by V2V and maintain the minimum distance between the vehicles. V2V exchange information like VID (vehicle ID), Status (Normal, Emergency and VIP) and Category (Public, Private and Personal). LTD² also calculates the distance between the vehicles. This system follows Distance-two-protocol during overtaking and also follows mesh topology with minimum distance. Distributed system allows route clearance for emergency and VIP vehicles by passing their decision to other vehicles which are in and around the emergency vehicle.

Keywords: LTD²,V2V,D2P,Topology

I. INTRODUCTION

India is a signatory to Brasilia Declaration and is committed to decrease the road accidents and fatalities by 50% by 2020. During the period from 2014 to 2015, the accidents rate is increased by 2.5% and the death rate are 4.6%. also, the injuries rate is increased by 1.4%

Most of the persons died in the accidents are in between 15-34 years old. This research focuses on the LTD² based vehicle driving for avoiding accidents. The LTD² (Listen, Topology Distance-two- protocol and Distributed System) avoids the accident and provides anti-collision system for vehicle driving. Which always listen the position of other vehicle by V2V and maintain the minimum distance between the vehicles. V2V exchange information like VID (vehicle ID), Status (Normal, Emergency and VIP) and Category (Public, Private and Personal). LTD² also calculates the distance between the vehicles by using the ultrasonic sensors. This system follows Distance-two-Protocol during overtaking and also maintain mesh topology. Distributed system allows route clearance for emergency and VIP vehicles by passing their decision to other vehicles which are in and around the emergency vehicle. Using this Vehicle-to-vehicle (V2V) communication automobiles can "talk" to each other. V2V form a wireless ad hoc network on the roads.

II. LITERATURE SURVEY/RELATED WORK

Yifu Liu et al [1] uses V2V for Vehicle position and context Detection with pre-crash detection and warning. Also share the longitude, speed and heading, as well as important vehicle data such as brake events, throttle position, turn signal status, etc.

Isamu Takai et al [2] investigated on Optical V2V based System Using LED Transmitter and Camera, also with CMOS image sensor.

Lorenzo Rubio et al [3] worked on the path loss propagation for the opposite direction vehicle in V2V Communication. The investigation is done in different environments with narrowband channel measurements at 700 MHz and 5.9 GHz.

B. Bhabani et al [4] investigated on Efficient bandwidth utilization during message dissemination among authentic vehicles in VANET.

A. Mondal et al [5] reduced the rate of transmission of messages to control channel congestion dynamically.

III. METHODOLOGY AND EXPERIMENTAL DESIGN

In this paper we try to find the right driving system by using LTD² vehicle driving system.

A. V2V Communication driving system development

V2V Communication system is used to avoid the crashes that consists of sensors on vehicles and dedicated short-range radio communication (DSRC) and with the help of few devices which enable the exchange of data between vehicles. This system supports upto 300 meters range.

The communication between vehicles and exchange information like VID (vehicle ID), Status (Normal, Emergency and VIP) and Category (Public, Private and Personal), Code for calculate distance between the vehicles by taking the distance values from the sensors.

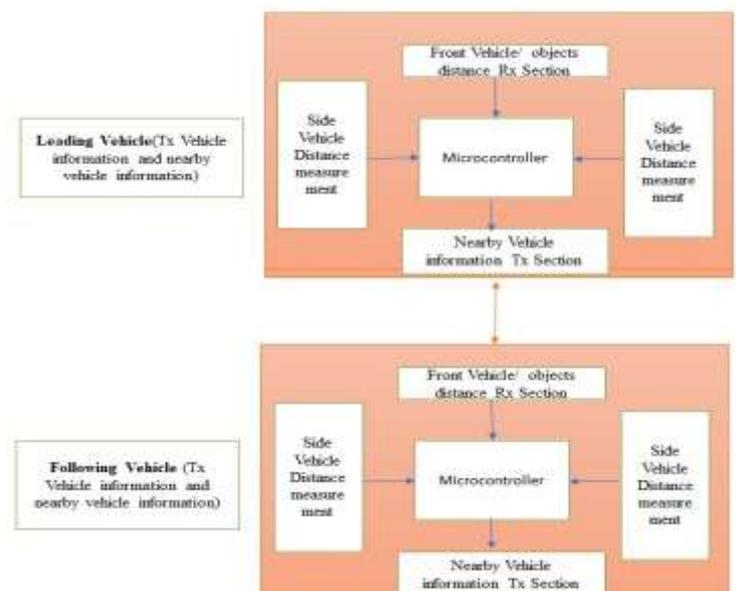


Fig1: V2V Communication

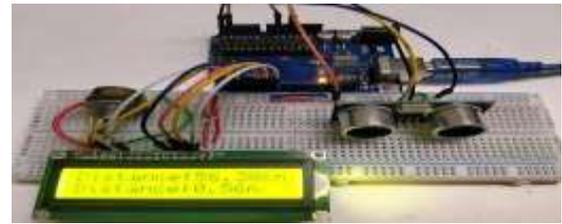


Fig3: LTD² vehicle driving System prototype

B. D2P protocol, Topology and Distributed system development

The Distance-two-protocol continuously calculate the distance from side vehicles and check it is greater than or equal to two feet's during vehicle overtaking and follows a mesh topology between vehicles with minimum distance. Also implemented Distributed system which allows route clearance for emergency and VIP vehicles by passing their decision to other vehicles which are in and around the emergency vehicle by passing the nearby vehicles information to the front vehicles.

C. Complete LTD² Vehicle driving System

The LTD2 vehicle driving System developed by integrating the individual modules and test the system.

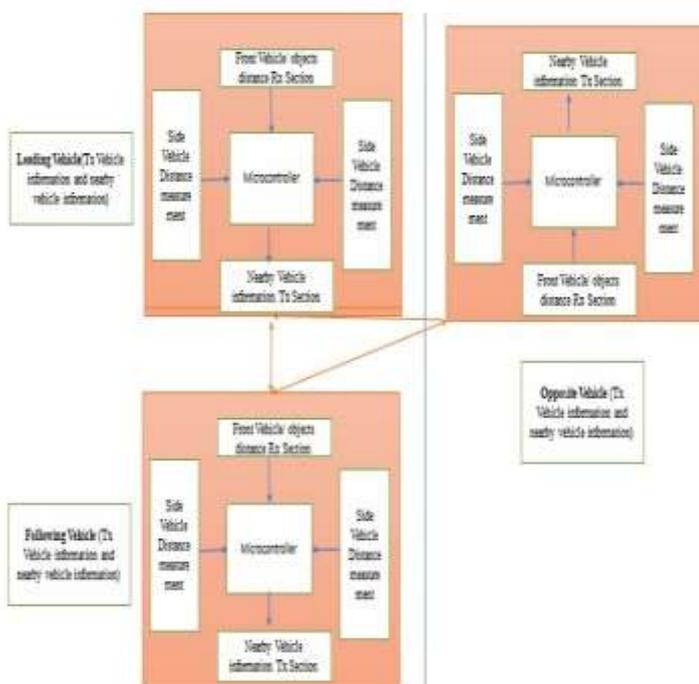


Fig2: LTD2 vehicle driving System

IV. TESTED RESULTS

The prototype system tested has 8 ultrasonic sensors mounted on four sides to the vehicle for measuring the distance from objects and vehicles, exchange of data between vehicles, including factors like Vid, speed, direction, and braking status, vehicle category.

LTD² vehicle driving System Algorithm follows bellow steps

Step1: Continuously measure the distance, vehicle information from nearby objects and vehicle.

Step2: If distance is less than the threshold distance the automatically adjust the speed.

Step3: If vehicle category is VIP or Emergency then automatically gives the route by taking the vehicle left position.

Step4: Passed that details to the front vehicles so that vehicle can alert and gives the route clearance to the VIP/Emergency vehicles.

Step5: During overtaking which checks the distance from side vehicle with the help of distance two protocol.

Step6: Which follows Mesh topology between vehicles.

V. CONCLUSION

In this work we have proposed the LTD² (Listen, Topology Distance-two-protocol and Distributed System) provides anti-collision system for vehicle driving. Distributed system allows route clearance for emergency and VIP vehicles by passing their decision to other vehicles which are in and around the emergency vehicle.

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