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A Novel Design and Implementation of V2V Communication for Smart Cities

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Abstract: Vehicle to Vehicle communication is one of the roaring technologies in the automotive technology. One of the new protocols called DSRC developed by SAE is smarter in the automotive filed. DANLAW has developed an application which is for the safety purpose to the driver by giving the cautions about the accidents and critical conditions. A tool called Mx-Suite is developed by the DANLAW which helps in generating the different simulations regarding the traffic conditions and other details of the vehicles.
Keywords: SAE, Mx-Suite, DSRC, DANLAW

I. INTRODUCTION

V2V is expanded as Vehicle to Vehicle communication which is a wireless communication. The main intension of the V2V communication is to avoid the accidents by giving continuous caution to the driver. There are several ways of communicating between the vehicles. The HIL bench set up is developed using which the different applications for safety purpose is developed. This helps in proving the alert signal to the driver.

A special tool called teraterm is used for initializing and running the application. By making use of HIL set up the costly or expensive devices can be guarded. It also helps in testing the device as early as possible and it brings the product to market in time.

Figure 1: Input Side of After Safety Market Device

Figure 2: Output Side of After Safety Market Device
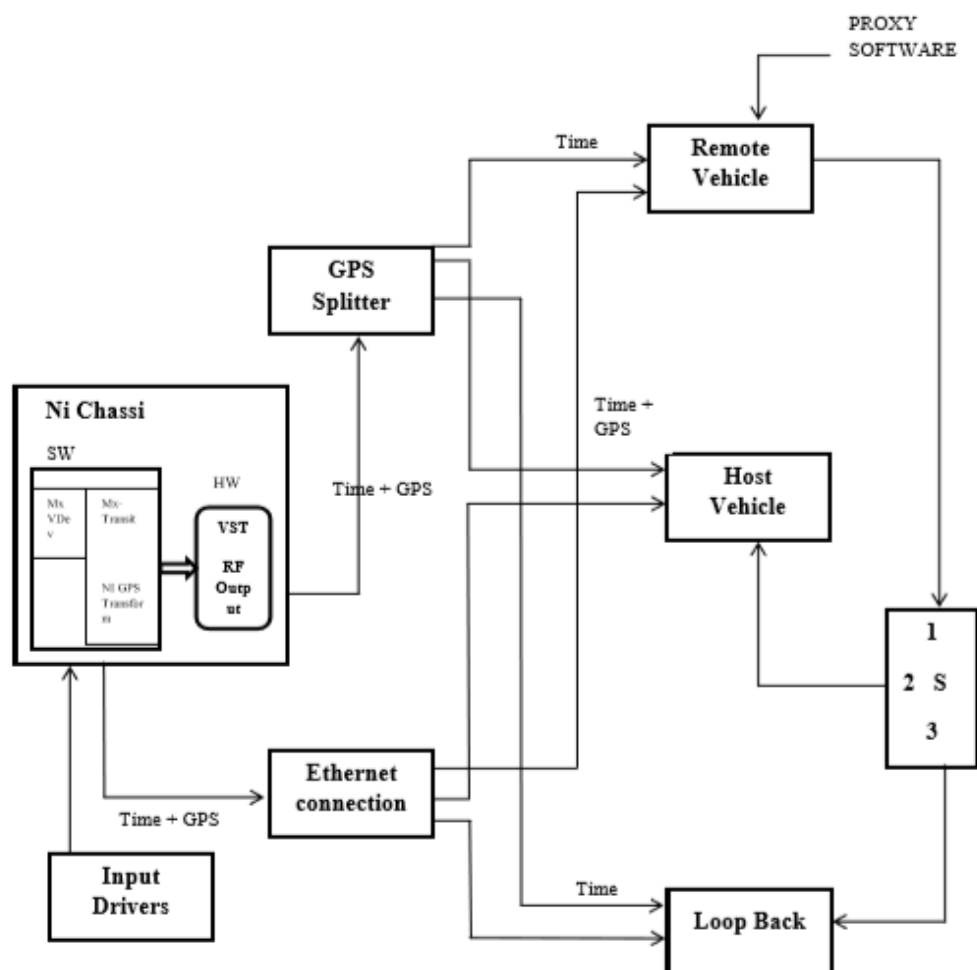
Figure 3: DANLAW HIL bench setup

II. METHODOLOGY

Figure 4: Block diagram of the proposed system

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Here inside Mx-Suite there is a sub tool called Mx-Transit which is used to make the wiring harness between software and hardware. It is also called as Mx-Drive simulator.

Vehicle gives the details about everything regarding the speed, longitude and latitude, start time, stop time and the travelling distance, heading, elevation, acceleration properties, gradient profiles.

With the help of simulators, the information about the host vehicle and remote vehicle are obtained. The help of all the information from the host vehicle and remote vehicle the control or the caution to the driver is provided. The safety is higher in the proposed system.

A. Results
1) Forward Collision Warning Result:

B. Simulated Result
1) *CASE1:* Before Host Vehicle is Approaching Remote Vehicle

Figure 5: HV is Approaching RV

2) *Case 2:* After Host Vehicle and Remote Vehicle crosses

Figure 6: Host Vehicle and Remote Vehicle crosses

C. Intersection Movement Assist Result

1) Simulated Result

a)   *CASE 1:* Before Host Vehicle is approaching Remote Vehicle

Figure 7: Host Vehicle is Approaching Remote Vehicle

2) CASE 2: After Host Vehicle and Remote Vehicle crosses

Figure 8: Host Vehicle and Remote Vehicle crosses

III. CONCLUSIONS

Road accidents are increasing day by day. The vehicle to vehicle communication is more helpful when it comes to avoid the accidents.

The accidents on national highways, state highways and even on the flyovers are avoided. The caution given to the driver helps in avoiding the dangerous situation. The traffic can be avoided, and the safety is provided at its best.

IV. ACKNOWLEDGMENT

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