Bulletin of Electrical Engineering and Informatics
ISSN: 2302-9285
Vol. 6, No. 4, December 2017, pp. 364~366, DOI: 10.11591/eei.v6i4.868

Vehicle-2-Vehicle Communication Based on Wireless Sensor Network

S. Sinthuja*, S.V. Saravanan
Department of Electrical and Electronics Engineering(Marine), AMET University, Chennai, India
*Corresponding author, e-mail: eei@journal.uad.ac.id

Truck Platooning is a car innovation that permits gathering various trucks into a single element where one truck intently takes after the other that outcome in an expanded street limit. This kind of detachment allows to a significant degree tight separations and synchronous driving between the vehicles. Our point is to plan and exhibit a self-ruling truck platooning framework given vehicle-to-vehicle (V2V) correspondence innovation. The structure utilises IEEE 802.15.4 remote convention joined with separation going sensors to enable vehicles inside the company to safely trade data progressively and naturally break and quicken in light of the lead truck. The rapid of remote correspondence permits to a significant degree tight separations and synchronous driving between the platooning vehicles.

***Keywords**: sonar, IR range sensor, MEMS compass, wireless network*

1. Introduction

Truck Platooning presented a remote creative innovation. Presently a day's the greater part of the issue happened in-vehicle unit [1]. Be that as it may, in this paper conquer this problem. The essential advantages of this innovation are recorded beneath. With the accompanying trucks braking quickly, with zero response time, platooning can enhance movement wellbeing [2].

The Smaller crevice between trucks lessens the air resistance, and in this way gives more noteworthy efficiency. This implies bring down fuel utilisation and less CO2 outflows. Efficiently helps movement streams consequently decreasing activity clog and long tailbacks. The slight separation between vehicles implies less space taken up out and about, and subsequently, expanded street limit [4]. Smoother and more unsurprising movement stream [5]. Beyond the motion segment, it offers opportunities to enhance the work market, coordination's and industry

2. Research Method

The system is demonstrated with two robotic vehicles capable of moving in forward, reverse, left, and right directions. In this paper introduced by wireless technology using IEEE 802.15.4 radios.It is a robotic module vehicle.

This establishes a V2V communication system where a 'lead' car (Figure 1) conveys its status/actions to a 'follower' vehicle (Figure 2) for synchronised movements.The lead vehicle is also constantly in communication with a smartphone app over a Bluetooth link. The suppression of the system is explained in the Media Access Delay and Throughput Analysis of Voice Codec with Silence Suppression on Wireless Ad Hoc Network [6].

Received September 5, 2017; Revised November 6, 2017; Accepted November 20, 2017

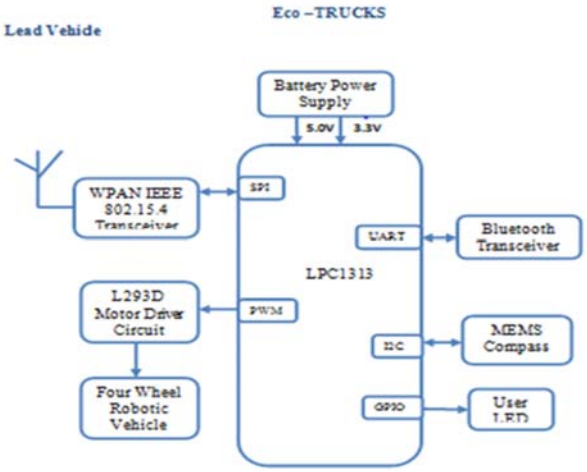

Figure 1. Lead vehicle

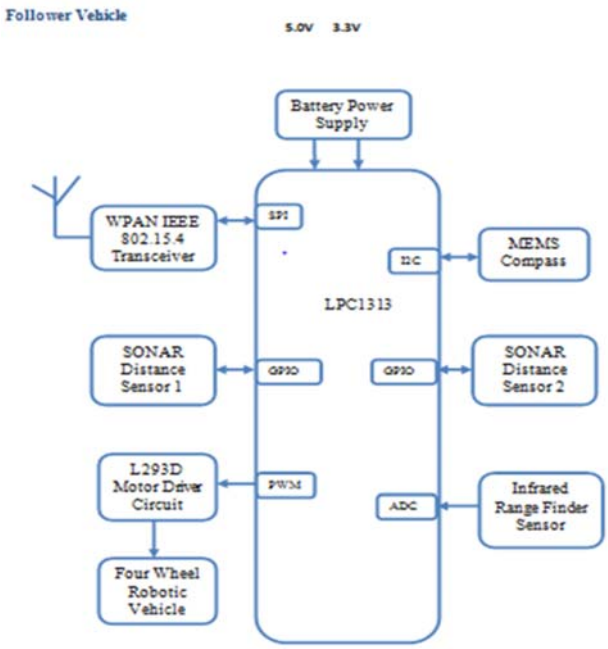

Figure 2. Following vehicle

3. Results and Analysis

Several different movements of the platoon are possible: forward, right turn, left turn, reverse, and braking. The lead vehicle then informs its status to the follower vehicle through IEEE 802.15.4 communication. Hash-based Technique to Identify the Selfish Node in Mobile Ad-hoc Network [7] explains the selfish node identification. The follower vehicle uses a set of distance measuring sensors like SONAR and IR rangers to estimate the accurate distance between itself and the lead vehicle so that it can reliably follow, as shown in Figure 3. Each wheel is controlled using a DC motor. Motor control is achieved using dual h-bridge chips Wireless Fault Detection System for an Industrial Robot Based on Statistical Control Chart is determined in [8].

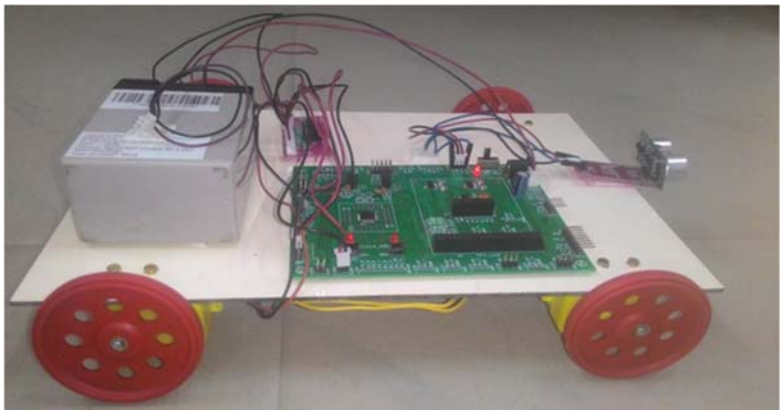

Figure 3. Co-operative autonomous truck

Each vehicle has an onboard MEMS compass sensor, which is a combination of an accelerometer and a magnetometer sensor that helps to estimate the direction of motion and also used to identify a collision situation.

4. Conclusion

Each one of the operations of the vehicle is controlled and done by an LPC1313 microcontroller. LPC1313 is an ARM Cortex-M3 based microcontroller that can run up to 72 MHz. It has 32 kb of blast memory and 8 kb data memory. There is as yet a useful measure of continued with the change required before this advancement can be familiar with the market. There is as yet an unimaginable course of action to be managed the extent that establishment, hazard and affirmation. This wander is a display to shows that truck platooning is possible. This demonstrating should make prepared for vehicle producers to be allowed to finish additionally testing of this development on open avenues with a particular real objective to pick up extensively more experience.

References

[1] B Placzek. Selective Data Collection in Vehicular Networks for Trafficcontrol Applications. 2012.
[2] R Rajamani, et al. Semiautonomous Adaptive Cruise Control Systems. Sep. 2002.
[3] D Swaroop, et al. Direct Adaptive Longitudinal Control of Vehicle Platoons. *IEEE Transactions on Vehicular Technology*. Jan 2001; 50(1): 150-161.
[4] D Swaroop, et al. Comparison Ofspacing and Head Way Control Laws for Automatically Controlled Vehicles. 1994.
[5] NC Basjaruddin, Kuspriyanto, D Saefudin, IK Nugraha. Developing Adaptive Cruise Control Based on Fuzzy Logic Using Hardware Simulation. *International Journal of Electrical and Computer Engineering (IJECE)*. December 2014; 4(6): 944-951.
[6] Shah, RD, Singh SK. Media Access Delay and Throughput Analysis of Voice Codec with Silence *Suppression on Wireless Ad Hoc Network*. Procedia Computer Science. 2016; 79: 940-947.
[7] Vennila G, Arivazhagan, D. Hash Based Technique to Identify the Selfish Node in Mobile Ad-hoc Network. Indian Journal of Science and Technology. 2015; 8(14): 1.
[8] Alaa Abdulhady Jaber, Robert Bicker. Wireless Fault Detection System for an Industrial Robot Based on Statistical Control Chart. *International Journal of Electrical and Computer Engineering (IJECE).* 2017; 7(6): 3421-3435.
[9] Kamel Bouzgou,Benaoumeur Ibari,Laredj Benchikh. Integral Backstepping Approach for Mobile Robot Control. *Telecommunication, Computing, Electronics and Control (TELKOMNIKA)*. Sep 2017; 15(3).