

WWVC 2013

Abstract:

Universal Medium Range Radar and IEEE 802.11p Modem Solution for Integrated Traffic Safety

Vehicles in the future are anticipated to have the ability to communicate and exchange useful information in order to avoid collisions. However, for this cooperation to be possible all vehicles will have to be equipped with compatible wireless IEEE 802.11p modules that implement intelligent transport systems operating in the 5 GHz frequency band standard (ITS-G5 or WAVE). During the implementation phase of the system there will be many older vehicles without such equipment that can cause hazard as information about them will not be available to vehicles equipped with IEEE 802.11p modules.

In this talk we present a system, to be used as a road side unit (RSU), developed explicitly for vehicle-to-infrastructure (V2I) communication that can solve the aforementioned traffic safety problems. The system consists of a universal medium range radar (UMRR) and an IEEE 802.11p modem integrated together to detect vehicles, with or without communication capabilities, and forward their position and speed vectors to vehicles, with IEEE 802.11p modules installed, for collision avoidance.

Tests have been performed by using our system in parallel with vehicles in which IEEE 802.11p modules are installed and comparing the content in the Cooperative Awareness Messages obtained from both systems. Accuracy tests have also been performed in order to verify the accuracy of the system in the time and spatial domains.

Bio:

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Fredrik Tufvesson received his Ph.D. in 2000 from Lund University in Sweden. After almost two years at a startup company, he is now associate professor at the department of Electrical and Information Technology, Lund University. His main research interests are channel measurements and modelling for wireless communication, including channels for both MIMO and UWB systems. Beside this, he also works on distributed antenna systems and radio based positioning.

Fredrik is currently associate editor for IEEE Transactions on Wireless Communications and has authored and co-authored around 30 journal papers and 90 conference papers.