Summary of SIP-adus project (FY2015)

Name of the project	Development of Vehicle-to-pedestrian Communication Technology
Responsible Organization	Panasonic Corporation /Panasonic System Networks R&D Lab. Co., Ltd./NTT DOCOMO,INC./ KDDI Research Institute
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Object of the Project

For the reduction of pedestrian accident, we realize a Vehicle-to-pedestrian system which is capable to alert drivers and pedestrians in the appropriate circumstances. We develop pedestrian-related Information collection & delivery system as well as underlying technology, required for a pedestrian's terminal, such as vehicle-to-pedestrian protocols, high-precision positioning, danger identification and pedestrian information verify their technical validity through experiments on public roads.

Project Summary

①Development of high-precision positioning technology
We are developing technologies to stabilize positioning accuracy in stages, taking into account the various scenes in which pedestrians might use it. For the accuracy degradation in high-rise buildings areas, positioning accuracy was improved by excluding the multi-paths, identified on the basis of satellite orbits and received electric field strength, from the positioning calculation. In addition, we have developed danger identification applications that can predict collisions between vehicles and pedestrians and warn them for the fatal accident cases.
②Development of a communications protocol for the vehicle-to-pedestrian communications system
Investigation of radio interference in 700MHz band cellular is essential for the popularity of pedestrian's terminal. We measured radio interference, in this measurement pedestrian's terminal is used as a interference-causing side while the 700MHz band cellular, consist of base station simulator and terminal simulator, is used as interference-receiving side. From the measurement results we find a signal level diagram where the 700MHz band cellular throughput is not degraded, which require attenuation between filter and antenna also ascertain the feasibility of filter and 700MHz band communication antenna. In addition, as a battery saving function, we realized control to activate and stop the 700MHz band communications of the pedestrian's terminal through Bluetooth from a smartphone.
③Development of an approach detection system along with a study to apply the system at intersections to estimate positioning.
We developed an approach detection system that swiftly captures the degree of proximity between motorized wheelchairs and pedestrians (and cyclists) and notifies both parties of looming danger. The system combines GPS positioning and BLE signal strength to estimate location. We considered applying this technology at intersections to estimate pedestrian location.
④Development of pedestrian-related information collection & delivery system and privacy protection system
We developed a web-based system to quantify pedestrians around crosswalk and to identify hot spots for sudden braking, by analyzing video data in cloud which are automatically uploaded from on-board smartphone cameras. In addition, we developed a privacy protection core system designed to be user-centric and user-friendly so that the public can make reliably manage their privacy.

Future plan

①Development of high-precision positioning technology
Expand field where the location precision can be maintained, expand likely situations for danger assessment
②Development of a communications protocol for the vehicle-to-pedestrian communications system
Examine more compact antenna
③We will develop a system and environment for the application at intersections to determine a target intersection size.
④Development of data exchange format for vehicle data and pedestrian-related information and data transfer protocol for privacy protection