PROJECT

WATCH-OVER

Vehicle-to-Vulnerable Road User Cooperative Communication and Sensing Technologies to Improve Transport Safety

Funding: European (6th RTD Framework Programme)
Duration: Jan 2006 - Dec 2008
Status: Complete with results
Total project cost: €5,909,472
EU contribution: €3,315,000

Background & policy context:

Over the last 30 years, the overall volume of road traffic has tripled (European Commission, 2003). Even though the number of road deaths has fallen by half during these years, it is still at an unacceptably high number. New on-board information and communication technologies offer considerable potential for reducing the number of traffic accident victims. The WATCH-OVER project aims at avoiding road accidents that involve vulnerable road users (VRUs), namely pedestrians, bicyclists and motorcyclists, by developing an integrated cooperative system for accident prevention. This topic was in line with the ambitious target of the EC, to reduce the total number of road fatalities by 50% by 2010.

Objectives:

The WATCH-OVER project aimed at avoiding road accidents that involve VRUs, namely pedestrians, bicyclists and motorcyclists, by developing an integrated cooperative system for accident prevention.

The core of the system, based on sensor and communication technologies, is the interaction of an on-board module and a user module, in order to cover a wide traffic scenario, including blind spots. Current sensor technologies cannot 'see' behind obstacles and have a limited view of lateral and longitudinal areas. The main difficulty in detecting VRUs is therefore the limited 'visibility' of car drivers and of in-vehicle sensor based systems.

WATCH-OVER aimed at improving these soft spots, by combining the most promising communication technologies with the most promising sensor technologies. Besides focussing on the exploitation of these advanced communication and sensing technologies, the main focus of the project was the design and development of the human machine interface (HMI) for both the driver and the vulnerable road user. Therefore, different solutions for the HMI have to be found: One would be an in-vehicle device, whereas the others would be based upon wearable devices for pedestrians, bicyclists and motorcyclists.

Methodology:

To succeed in developing an efficient cooperative system for accident prevention, the work in the WATCH-OVER project was divided into seven different work packages (WPs). In these work packages the tasks for the involved partners in the project were defined as follows:

WP1 Project management and exploitation

WP1 dealt with the management of all financial, administrative, technical and non-technical aspects of the project. Key activities of this work package were the exploitation of project results, the association to other related R&D projects and the standardisation bodies.

WP2 User requirements and scenarios

The goal of WP2 was to identify the needs and requirements of the target users as well as to analyse the most relevant scenarios of application.
WP3 Overall system specification

In WP3 the functional architecture specifications of the WATCH-OVER system were defined. Furthermore, all communication and sensor technologies as well as the warning and intervention strategy were specified.

WP4 Communication and Sensing Technologies

WP4 dealt with the major technological aspects of the project. It analysed and adapted the selected communication and sensing technologies and worked on data fusion.

WP5 System development

In WP5 the different subsystems were developed as well as the on-board and wearable devices and related software applications. Particular attention was paid to the HMI design for the driver and for the VRU.

WP6 Cooperative system test and validation

In WP6 the WATCH-OVER application was integrated in the demonstrators for testing. The demonstrators were: the vehicles, cars and motorbike and the wearable module. Also technical and user acceptance tests were performed.

WP7 Deployment strategies and dissemination

WP7 dealt with the strategies related to the deployment of the WATCH-OVER system. In particular, the main activities were a thorough market analysis as well as a cost/benefit analysis, the evaluation of the impact on road safety and the dissemination of the project activities.

Parent Programmes:
FP6-IST - Information Society Technologies - Priority Thematic Area 2 (PTA2)

Institute type: Public institution
Institute name: European Commission
Funding type: Public (EU)

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Key Results:

The project ended successfully in December 2008. The WATCH-OVER project was successfully completed, all tasks were finalised and approved at the Project Plenary Meeting. The Final Review was held on December 16th, where the WATCH-OVER project results were introduced in form of different demonstrators and live demonstrations of the developed system. The WATCH-OVER project results were
greatly approved by the European Commission and the project reviewers.

The results presentation was mainly focus on the technical activities of WP 5 ‘System Development’ and WP 6 ‘Cooperative System Test and Validation’ in order to conclude the technical system development. Another focal point was the work package 4 ‘Communication and Sensing Technologies’.

The system core was the cooperation of an in-vehicle unit with a user module based on communication and sensor technologies. The in-vehicle module will locate vulnerable road users that are in potentially hazardous locations and will then give a warning signal to the driver. On the other hand the wearable user module will draw attention of the vulnerable road users to dangerous traffic situations. The interaction of the different modules rests on the exploitation of innovative wireless short range communication technologies and promising sensor technologies. With this cooperation the actual coverage of existing systems will be extended and the WATCH-OVER platform will in addition be open to the integration of localisation technologies.

WATCH-OVER presented two demonstrators cars on the 2008 IEEE Intelligent Vehicles Symposium (IV’08) in Eindhoven, the Netherlands.

Daimler presented the latest system for real-time vision-based pedestrian detection from a moving vehicle. The demonstration was conducted with real pedestrians on the test rack and also in real urban traffic. The University of Chemnitz provided a live demonstration of a pedestrian recognition system using a near infrared camera.

Documents:
- Project Presentation

STRIA Roadmaps: Cooperative, connected and automated transport
Transport mode: Road transport
Transport sectors: Passenger transport, Freight transport
Transport policies: Digitalisation, Safety/Security
Geo-spatial type: Other