INTELLIGENT TRANSPORTATION SYSTEMS

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Announcements, feature articles, books and meetings reviews, opinions, letters to the editor, professional activities, abstracts of reports, and other material of interest to the ITS community is solicited.

Please submit electronic material for consideration in any of the following formats: LaTeX, plain ASCII, PDF, or Word, and pictures seperately in jpeg format to the Editor at b.vanarem@utwente.nl *as well as to the assistant* d.alink-olthof@utwente.nl *at least 1 month prior to the newsletter's distribution:*

Issue	Due date
March	February 1^{st}
June	May 1^{st}
September	August 1^{st}
December	November 1^{st}

Research Review

by Angelos Amditis

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IEEE ITSS Newsletter is happy to introduce starting from this issue a special section focusing on research activities worldwide.

In this volume of the IEEE ITSS Newsletter the focus is on the European activities on Active and Preventive Safety and Human Machine Interaction, namely the co-funded by the 6th European Research Framework Programme Integrated Projects PReVENT and AIDE..

Activities on Traffic Management, Rescue and Services and Cooperative Systems will follow in successive Volumes of the Newsletter where anyone interested is welcome to contribute.

If you are interested in publishing material to the research section please send a short one page text with focus on the overview of research results and activities world wide.

Please, send you contributions for future newsletters to a.amditis@iccs.gr.

Review of the EU projects PReVENT and AIDE

Introduction
Road safety is a major concern for all of us. Although things have improved in recent years, the number of road fatalities is still unacceptably high in the European Union and all over the world. In 2000, road accidents killed over 40000 people in the European Union and injured more than 1.7 million. Trying to address this huge problem, European Commission, between other things, launched eSafety, which is a joint initiative of the Research Community with the industry and other stakeholders aiming to accelerate the development, deployment and use of Intelligent Integrated Safety Systems, that use information and communication technologies in intelligent solutions, in order to increase road safety and reduce the number of accidents on Europe's roads. For more information you can visit: http://www.escope.info/

Building the Active Safety Systems of the future
PReVENT (EC, 6th FW Integrated Project, IST) envisions the early availability of advanced, next generation preventive and active safety applications and enabling technologies and an accelerated deployment on European roads. PReVENT consists of a number of subprojects in complementary function fields:

- **Safe Speed and Safe Following**
  These functions help drivers keep or choose a speed or inter-vehicle distance, allowing them to safely cope with the road situation they will meet in the following seconds. The approach is mostly autonomous.
- **Lateral Support**
  This field deals with autonomous applications focusing on the lateral areas of a vehicle to help drivers keep their vehicle at the safest position in the lane, as well as warn them if the vehicle is about to run off the road.
- **Intersection Safety**
  This function field covers the investigation of autonomous and cooperative approaches to safety applications dedicated at approaching or passing intersections.
- **Vulnerable Road Users and collision Mitigation**
  Collision mitigation and pre-crash protection systems focus on reduction of injuries and fatalities in case of unavoidable crashes (in particular during the last 2-3 seconds before the impact). Collision mitigation by braking significantly reduces kinetic energy of impact, thereby greatly reducing crash severity.
- **Cross-functional Activities** An additional cross-functional field covering methodologies, common architectures, liability issues, and technology or standardization oriented activities safeguards a common approach.

More information on PReVENT can be found at http://www.prevent-ip.org.

The INSAFES Subproject
Most of the functions described above are being developed and tested within this year- finishing date January 2007 - , therefore I would like to point out a cross-functional activity which integrates different function fields and will continue until the beginning of 2008. This cross-functional activity is one of the PReVENT's subprojects called INSAFES and its general goal is to improve the functionality and reliability of applications developed within PREVENT and to advance from stand-alone safety applications, targeting one specific function each, to an integrated system, covering a vast range of applications. INSAFES focuses on the full coverage of the surrounding of a vehicle, in order to warn the driver, intervene, or mitigate the effects of an accident. INSAFES addresses the proper use and interpretation of all the information available from sensors or functions that are being developed in PReVENT, and the subsequent situation and risk assessment. INSAFES functions include:

- All around collision warning
- Integrated longitudinal support - including collision mitigation, safe speed, and hazard detection increasing the Safety margin
- Optimal Maneuver suggestion
- Lane Keeping support with lane offset adapted to vehicles in adjacent lanes
- Lane change aid with haptic feedback and correction
- Low speed obstacle warning and start-inhibit
- Enhanced curve speed warning

A sub-set of the functions co-exist in the vehicle, thus, coordination is needed in order to support the driver in the optimal sense. This coordination of functions is performed in INSAFES in accordance to the work of the AIDE Integrated Project which focuses in turn on the design and development of adaptive and integrated HMI solution for the future vehicles.

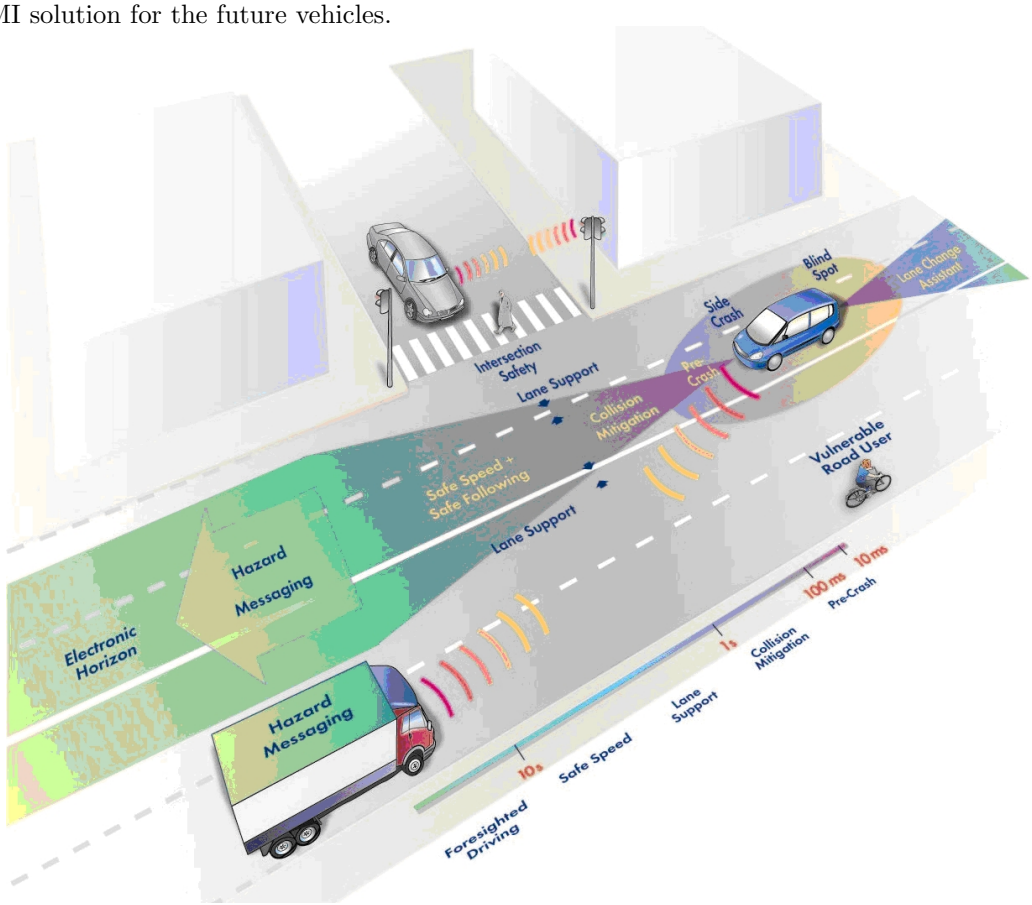

Figure 1: PreVENT applications

The AIDE Integrated Project: Building the future automotive HMI solutions

The general objective of the AIDE IP (EC, 6th FW Integrated Project, IST) is to generate the knowledge and develop the methodologies and human machine interface technologies required for safe and efficient integration of multiple driver assistance and information functions into the driving environment. Specifically, the goal of the IP is to design, develop and validate a generic Adaptive Integrated Driver-vehicle InterfacE (AIDE) that...

- maximizes the efficiency of individual and combined advanced driver assistance systems by means of innovative, integrated and adaptive, human-machine interface concepts that prevent negative behavioral effects (e.g. under-load, over-reliance and safety margin compensation) and maximizes positive effects (e.g. enhanced situational awareness), thereby enhancing the safety benefits of these systems. AIDE should demonstrate significantly enhanced safety benefits compared to existing solutions.
- reduces the level of workload and distraction related to the interaction with individual and combined in-vehicle information and nomad devices, thereby reducing the number of road accidents. AIDE should demonstrate a significant reduction in the imposed workload and distraction compared to existing solutions.
- enables the potential benefits of new in-vehicle technologies and nomad devices in terms of mobility and comfort, without compromising safety. AIDE should demonstrate that the benefits of new in-vehicle technologies could be enjoyed without increased accidents risk

The work in the AIDE IP is organized in four sub-projects (SPs), which are major blocks of work in the IP. Each SP is further divided into work packages (WPs) which, in turn, consist of a number of tasks. Each of the sub-projects 1-3 deals with one of the main aspects described in the "Objective"- section, i.e. behavioral research, methodological- and technological development respectively, where SP3 is the largest in terms of resources allocated. The fourth sub-project gathers a number of horizontal and common activities, including the Consortium Management and dissemination and deployment activities. The AIDE sub-projects are:

- Sub-project 1: Behavioral Effects and Driver-Vehicle-Environment Modeling
- Sub-project 2: Evaluation and Assessment Methodology
- Sub-project 3: Design and Development of an Adaptive Integrated Driver-vehicle Interface
- Sub-project 4: Horizontal Activities

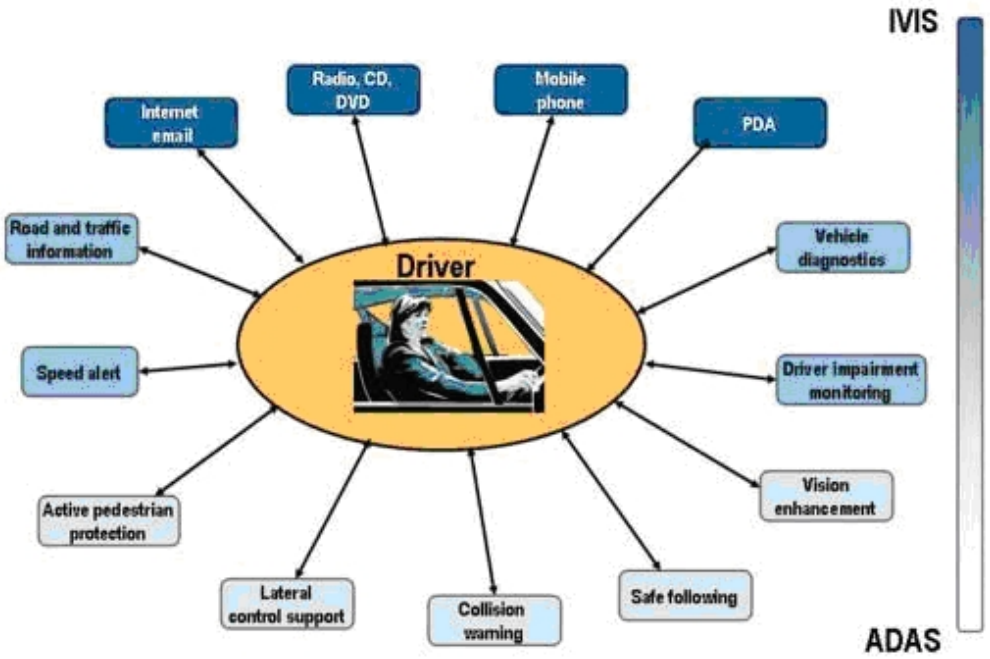

Figure 2: AIDE proposes a unified HMI solution for integrating ADAS and IVIS

In order to reach these objectives, three sub-goals have been defined:

- Development of a model for prediction of behavioral effects of driver assistance and information systems. This model will be the basis for the design of the adaptive integrated driver-vehicle interface.
- Development of a generic, industrially applicable, methodology for the evaluation of road vehicle human-machine interfaces with respect to safety. This methodology will be used for verifying the quantified goals stated above.
- Design, development and evaluation of three prototype vehicles, one city car, one luxury car and one heavy truck, with the adaptive integrated driver-vehicle interface implemented.

AIDE project started in March 2004 and its duration is four years. More information can be found at http://www.aide-eu.org.

Conclusions

A lot of effort is spent for the development of new Active Safety systems and interaction strategies that are expected to address part of the problems that lead to the unacceptable high number of traffic accidents and casualties. The concept that prevailed in EC research the last years was to involve all relevant stakeholders in large Integrated projects able to gather the needed resources and consensus in order to address important research issues. Examples of this policy are also AIDE and PReVENT that were presented in this bulletin. As these projects have just passed their mid life it is very interesting and important to see their results demonstrated in a wider audience.

That is why in September 2007, a common Safety Application Road show will be organized by PReVENT, involving all project participants to exhibit the project results and create awareness as an important milestone for the preparation of the European market. AIDE will be also present at this event.

References and links

http://www.prevent-ip.org
http://www.aide-eu.org
http://www.cordis.lu