



## **SUMMER SCHOOL ON**

# **“INTELLIGENT TRANSPORT SYSTEMS: DESIGN AND SAFETY”**

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## **CONTENT OF LECTURES AND CV OF SPEAKERS AND AFFILIATIONS**

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### **Design guidelines for human machine interaction for in-vehicle systems**

Design Principles are intended to help engineers develop HMI elements for a wide range of product users. It is intended that those products will be safe and easy to use; they will not cause accidents or distract people from driving and that information can be obtained quickly and without error. These products should be at least as usable and useful as existing in-vehicle information systems in the market. Finally, they should require no learning. A typical driver, without instruction and without referring to a manual, should be able to use them correctly the first time. The guidelines that are to be presented in this talk, are deriving from the relevant work conducted within the AWAKE FP5 Project, based on the European Statement of Principles on HMI (C1999/4786) and extended literature survey, which were reviewed during the validation phases of the project. AWAKE developed a driver monitoring system that detects in real-time driver hypovigilance and provides effective warning through innovative HMI elements (visual warning on rear-view mirror, seat-belt vibration, rumble strips sound emulation) aiming to prevent traffic accidents attributed to driver fatigue. In addition a simulation of the AWAKE HMI module will be presented as a support scenario for the reviewed topics.

### **Road safety from a future perspective: innovative aspects of cooperative systems**

During the last decade, the European Commission has given major emphasis to the enhancement of road safety and has subsidised numerous research projects for securing infrastructure safety and in-vehicle safety. Through these projects, various systems (traffic information, traffic management, navigation, passive safety/driver monitoring, preventive safety/intervention systems) have been developed and many of them have been commercialised or have shown promising marketing potential. However, the current status of the telematic in-vehicle and infrastructure-based applications have resulted to complex and/or redundant information to the driver due to the incompatibility of the different systems and the lack of automatic communication between them in order the driver to receive merged and filtered information through the HMI elements installed in his/her vehicle. . The combination of new technologies with existing infrastructure may lead to much more cost-efficient solutions. Thus, after the development of all these systems the future aspect of road safety is visible through the introduction of cooperative systems where vehicles and infrastructure systems will communicate automatically and provide the necessary warnings to the driver. This talk aims to preview the potential effects of the cooperative HMI systems to the driver workload, as well as the impact to the road safety after their implementation.

Stella Nikolaou is a software programmer and she is involved in the research team of the Hellenic Institute of Transport dealing with driver behaviour monitoring and human factors impact on road safety. She has been involved in various national and European research projects, whereas her main research focus includes the monitoring of the driver behaviour for the enhancement of road safety through the use of Advanced Driver Assistance Systems (ADAS), studies of human sleep for safety enhancement in industrial applications and the reduction of accidents attributed to operator's lack of alertness, and the development of high-end user interfaces for several industrial applications. She led the validation tests of the FP5 Project 'AWAKE', which developed a driver monitoring system for driver fatigue detection in real-time. She is the Task Force 'F'



Leader in the FP6 European Network of Excellence 'HUMANIST' related to the theoretical and practical drivers' training on ADAS use, and Leader of Subproject '4' of 'SENSATION' FP6 Integrated Project, dealing with the development of multi-sensorial systems for the reduction of industrial accidents that are attributed to operators' lack of alertness.

The Hellenic Institute of Transport (HIT) is the newly created National Institute for the promotion of Transport Research and Transport Policy support, the first of its kind in Greece. It focuses on applied research in all fields of Transport, with the aim to provide inputs for, among other fields, policy formulation, documentation of major trends and impacts in the field of Transport, formulation of operational rules and procedures, improvement of the operation and management in the various Transport modes, etc. HIT also promotes international relations and co-operation between Greek and foreign research bodies, in the field of Transport, and acts as advisor to Government bodies on issues of Transport policy formulation. HIT is organized into the following 5 sectors: Specialized research and analyses. Special emphasis is given to new technologies applications. Documentation and Databases. Dedicated to data collection, and the development, support, and maintenance of databases in the field of Transport in Greece. Dissemination of research results, research evaluation, and training programmes. Standards and standardization activities. Quality control, and safety promotion. Promotes and applies quality control procedures in the field of Transport in Greece, and also investigates and promotes road safety. HIT forms part of the Centre for Research and Technology Hellas (CERTH).