INFORMATION SOCIETY TECHNOLOGIES (IST) PROGRAMME

AIDE
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DVE monitoring modules design and development – first release

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Activity No.	**A3.3.1-3.3.5**	Activity Title	**DVE monitoring modules design and development**
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Executive Summary

The objective of the AIDE project is to design, develop and validate an innovative Adaptive Integrated Driver-vehicle InterfacE (AIDE) which aims to maximise the efficiency, and the safety benefits of advanced driver assistance systems, to minimise the level of workload and distraction imposed by in-vehicle information systems and nomad devices

To reach these objectives, a high level of perception is needed so as the system is able to estimate the state of the driver the vehicle and the environment (DVE). DVE state should have knowledge of:

- *Input control information* (e.g. steering wheel angle, pedal position, buttons. . .)
- *Driver information (*e.g. head-/eye movement, eyelid activity . . .)
- *Environnent and trafic information (*Obstacles, road, …), etc.
- *Vehicle dynamic state s (*velocity, acceleration, yaw rate . . .)

According to the functional requirements and scenarios for the adaptive HMI defined in work package 3.1 as well as the architectural specification from work package 3.2, the objective of this work is to develop a set of DVE modules that perceive the driver, the vehicle and the environment. Each module addresses a different dimension of the DVE state. The dimensions include primary (driving) task demand, secondary task demand, driver's state of degradation (e.g. fatigue or hypovigilance), driver characteristics and environment/traffic conditions. In turn, the DVE modules use a common DVE sensor set including active and passive sensor systems that perceive the surroundings or the cockpit activities (radars, laser scanners, mono or stereo vision, etc.), typical messages available in the bus (odometer, yaw rate sensor, etc.) and a positioning system (accompanied with a map data base).

Five (5) modules are considered describing the Driver availability and ability to drive the vehicle, namely:

- The Traffic and Environment Risk Assessment Module (TERA) which estimates in real time the total level of risk related to traffic and environmental parameters.
- The Driver Characteristic module (DC) which includes the definition and estimation of the driver typical profiles.
- The Driver Availability Estimator (DAE) focusing on the analysis of the primary task activities, while the Cockpit Activity Assessment (CAA) module is considering the availability effects of a secondary task.
- The Driver State Degradation (DSD) module which is monitoring the driver's fatigue and hypo-vigilance.

The development of the DVE modules is an on-going process; first prototypes are available and modules are tested in partners' labs and test vehicles. The final prototypes will be released in August 2006 according to the plans and taking into account results from SP1 (driver models) and SP2 (workload, risks, etc.). The prototypes will be integrated to the AIDE demonstrators and tested with all AIDE components.