PROJECT

AWAKE

System for effective Assessment of driver vigilance and Warning According to traffic risk Estimation

Funding: European (5th RTD Framework Programme)
Duration: Sep 2001 - Sep 2004
Status: Complete with results

Background & policy context:

Driver fatigue warning systems intend to warn the driver when the driver's alertness is below a level that is no longer consistent with safe operation of the vehicle. The device should temporarily enhance driver alertness to avoid a crash situation, but it is not intended to be used by the driver as a means to stay awake over long periods of driving, although it might be used as such. Driver alertness monitors attempt to detect periods of driver impairment due to drowsiness or other lapses of alertness. The impaired state might be brought on by drowsiness, fatigue, sleep deprivation, or even medication, drug abuse, alcohol, naturally occurring stressors, and environmental factors. Research indicates that drivers are able to recognize their drowsy condition but are not good at recognizing the point of sleep onset. These devices provide the driver with an aid for recognizing this condition.

Driver fatigue warning systems may significantly contribute to traffic safety. The successful implementation, however, is not only influenced by the state of technology but also by a variety of social and institutional conditions.

Objectives:

The aim of the AWAKE project is not only to demonstrate the technological feasibility of driver vigilance monitoring systems but also to explore the non-technical issues that may influence the success of implementing these systems in real life traffic.

Methodology:

AWAKE intends to develop an unobtrusive, reliable system, which will monitor the driver and the environment and will detect in real time hypo-vigilance, based on multiple parameters.

Parent Programmes:
FP5-IST KA1 - Systems and services for the citizens
Institute type: Public institution
Institute name: European Comission, DG Information Society
Funding type: Public (EU)

Partners:
Belgium:
AIT/FIA, BIVV/CARA

France:
ACTIA; CNRS-CEPA; CNRS-LAAS, SIEMENS

Germany:
Daimler-Chrysler; IAT

Greece:
ICCS; National Center for Research and Technology Hellas (CERTH)
Key Results:

- AWAKE has developed the state-of-the-art basis where further major research is already initiated.
- AWAKE devoted a great effort on developing an integrated combined driver fatigue monitoring system.
- AWAKE developed integrated professional and marketable HMI elements.
- AWAKE is the bridge from driving simulator environments to real road environments using three different demonstrator prototypes, enhancing the market potentials of such systems.
- Enhancing Road Safety and contribute by a significant percentage to reduction of fatigue related road accidents

Technical Implications

- HMI Development & Guidelines: AIDE IP has used the state-of-the-art of the AWAKE DWS in order to further develop effective warning strategies and elements in order to increase traffic safety Europe-wide. In addition the ‘Design Guidelines Handbook’ developed in AWAKE, will contribute to the standardisation objectives of AIDE.
- Hypovigilance Detection & Prediction: SENSATION IP has used the knowledge gained from AWAKE in order to develop 17 micro and 2 nanosensors in order to better detect human physiological state. SENSATION also puts a big effort in order to develop sufficient data to reach a ‘golden standard’ for using as reference for hypovigilance prediction and detection algorithms, a big gap identified within AWAKE. SENSATION extends the hypovigilance detection algorithms also to industrial operators’ fatigue monitoring including however also driver fatigue.
- HMI & Driver Behaviour Modelling: HUMANIST NoE will use AWAKE results in order to achieve knowledge transfer and sharing in the areas of HMI and driver behaviour modelling, where AWAKE has achieved a breakthrough. AWAKE will highly contribute in HUMANIST aim to develop a driver cognition model in the case of hypovigilant (fatigued) driver.
- Sensors & Algorithms: PREVENT IP/ADMON SP will use AWAKE knowledge in order to proceed to advanced sensor technology development and new sensor fusion approach to monitor the vehicle and its environment, as well as assess driver fatigue and hypovigilance through innovative and reliable algorithms.

Policy implications

Recommendations to authorities:

- Increase knowledge in the safety effects of driver fatigue warning systems
- Promote and support the setting up of safety-standards for driver fatigue warning systems and implement theme in adequate legal frameworks
- Use instruments to stimulate market demand for driver fatigue warning systems
- Explore possibilities to incorporate into traffic safety policies issuing driver licences
- Explore possibilities to incorporate driver fatigue warning systems into traffic safety policies/ working time regulations for professional drivers
- Explore possibilities to incorporate driver fatigue warning systems into traffic safety policies/ mandatory vehicle equipment
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