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
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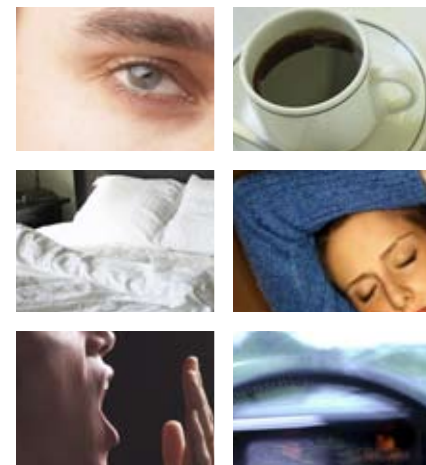
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Every year fatigue in traffic causes hundreds of thousands of accidents all over the world. Swedish authorities have now joined up with industry to develop a system that will reduce the number of fatigue related accidents in traffic.

www.ivss.se/drowsi



DROWSI - PREVENTS FATIGUE IN TRAFFIC

Fatigue is one of our most serious traffic safety problems. The Swedish government has resolved to focus on this problem and to find solutions. A large step will now be taken through the project DROWSI which is the greatest endeavour so far in Sweden to tackle this problem. The project extends over 3 years and is performed within the framework of the national research and development programme IVSS (Intelligent Vehicle Safety Systems). Production of a good solution requires experience, research and technical knowledge, something that cooperation between authorities, research institutes, universities and industry can offer. To reach the best results in this project, it has been decided that VOLVO and Autoliv are to cooperate with the Swedish Road Administration, VTI, IPM, and Chalmers University of Technology.

The project aims to develop technical aids which can detect fatigue and prevent the driver falling asleep at the wheel.

In order to achieve the best results in the project, an investigation will be made of human behaviour and the human factors that occur in conjunction with fatigue in traffic, together with research into the signs that indicate fatigue. In parallel with this, an investigation will be made in order to discover the options for detecting the signs of fatigue with technology, and prototypes will be produced for tests and demonstrations.

The primary objective of DROWSI is to perform multidisciplinary research and development of concepts and technologies for real time prediction of fatigue and for countermeasures. The fatigue problem will also be tackled on several levels through medical research into vehicle related fatigue and investigations of costs/benefit aspects, safety benefits, the roles of various interest groups and deployment issues. The concrete results will be system solutions for passenger cars and lorries. A secondary objective is to create a sound basis for further Swedish research and development in the field of fatigue.

In order to develop a structure and achieve results quickly, the project has been divided into work packages where the involved parties have different responsibilities.

<p>Work Package 1 Basic research</p> <p>Leader: IPM</p>	<p>Basic research that offers a knowledge base and broader understanding of fatigue in traffic. In turn, this will provide support for applied work on the other parts of the project.</p>	
<p>Work Package 2 Development of warning strategies</p> <p>Leader: VTI</p>	<p>Prevention of fatigue related incidents/accidents demands the development of effective warning strategies. The starting point is to make use of a number of modalities such as sound, light and vibrations with the aim of making the driver aware of his condition and inducing him/her to take action.</p>	
<p>Work Package 3 Development of algorithms</p> <p>Leader: CTH</p>	<p>The final result in this work package is a fully developed algorithm that can precisely and reliably predict drowsiness in drivers.</p>	
<p>Work Package 4 Development of prototype</p> <p>Leader: Autoliv</p>	<p>Comprises development of appropriate prototype environments for testing the predictions and the countermeasures that have been developed in previous work packages.</p>	
<p>Work Package 5 Experimental tests</p> <p>Leader: VCC</p>	<p>Concerns a number of experimental tests performed in the field. During these experiments a study will be made of various aspects such as technical reliability, efficacy and behavioural effects.</p>	
<p>Work Package 6 Deployment issues</p> <p>Leader: VV</p>	<p>Finally, but with activities taking place during the entire project, an examination will be made of issues related to ethics and legal aspects, safety gains, market analysis and information campaigns.</p>	

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COMBINED EXPERIENCE, RESEARCH AND EXPERTISE



IPM, Swedish Institute of Psychosocial Medicine, has long experience of research into sleep, sleepiness and stress. This comprises a number of studies which have coupled sleepiness/lack of sleep with safety, described which factors regulate sleepiness and sleep (circadian/homeostatic), defined what characterises disturbed sleep and sleepiness physiologically and behaviourally, and developed mathematical models to predict the development of sleepiness/performance impairment.



Safety is a core value for **Volvo** and the company is working continually in the field of vehicle safety to strengthen its position as a leading player in the world. Volvo brings essential knowledge of the interaction between vehicle and driver to the project and the company has a sound experience of developing and testing active safety and driver support systems. The issue of fatigued drivers has been recognised as a serious problem for a long time and Volvo has many years of research experience in the area of driver fatigue.



Volvo cars are the safest and most exciting vehicles for today's modern families all over the world. At Volvo, we are proud of our product. We are proud of the values that Volvo cars represent – quality, safety and consideration for the environment.

Within the framework of DROWSI, we will perform tests with tired drivers. These tests will be made on a test track in a real car. Our ambition is that the circumstances of the test should be as realistic as possible, while at the same time the test should be safe for the driver.



Autoliv develops and manufactures vehicle safety products for all major automotive manufacturers in the world, and has extensive knowledge and experience concerning commercialisation of vehicle safety systems. Autoliv has been responsible for almost all major innovations in the vehicle safety industry during the past 20 years. Autoliv also has previous experience from developing and evaluating sensors for the detection of fatigue in drivers. Commercialisation of the results from DROWSI will therefore be a logical and natural extension of the work of Autoliv.



The Swedish Road Administration creates opportunities for efficient, safe and environmentally sound transport, focusing on people. Success in this field requires knowledge, commitment and receptiveness to ideas. We regard traffic safety as a key issue for the good journey, and in this endeavour both the road, the vehicle and human attributes must be considered.

We consider that the DROWSI project has great potential to improve human attributes relating to driving, both in a private and professional capacity. Fatigue in traffic is a serious traffic safety problem which is responsible for a large proportion of our most serious accidents. This is why we support the DROWSI project with knowledge, commitment and funds in order to find new solutions to the prevention of fatigue in traffic.



VTI is an independent and internationally prominent research institute in the transport sector. Our work covers all modes and our core competence is in the fields of safety, economy, environment, traffic and transport analysis, public transport, behaviour and the human-vehicle-transport system interaction, as well as in road design, operation and maintenance.

VTI is a world leader in several areas, for instance in simulator technology. For a number of years, VTI has worked to increase knowledge and to find countermeasures to fatigue in traffic and has, for instance, been engaged in EU-projects such as SAVE, AWAKE and SENSATION.



Chalmers University of Technology has a long tradition in vehicle safety, which may be seen in innovations such as backward facing seats for children and crash dummies which are used by Volvo, Saab and other vehicle developers.

The Department of Applied Mechanics at Chalmers carries out research in the field of adaptive algorithms with applications in vehicle dynamics and robotics. The greatest contribution Chalmers will make to DROWSI will be the development of reliable and effective algorithms for detecting fatigue.