

Evaluation of a fragrance system to counter sleepiness at the wheel

Objective

Driver fatigue is a major cause of car accidents, and the prevention of fatigue is a major goal in the automotive industry. To reach the goal of zero traffic-accident fatalities, developing innovative solutions to prevent fatigue is a key objective. The aim of this study is to evaluate the feasibility of using a chemosignal-based alerting fragrance (Moodify Red) during a driving task as well as assessing if the fragrance has a measurable effect on driver sleepiness and attention. The Swedish National Road and Transport Research Institute (VTI) is responsible for project management. Partners in the project are Volvo Cars, Moodify, Karolinska Institute (KI) and the Weizmann Institute of Science (WIS).

Expected results

This project has the potential of resolving one of the central unresolved issues relating to driver fatigue, namely the possibility to effectively counteract sleepiness when it appears. Developing a system that alerts a sleepy driver to avoid fatigue related accidents would indeed contribute towards the development of so-called zero vision vehicles. If the Moodify Red fragrance system has the desired effects on fatigued drivers, further research and development will be planned to test and implement the system in the operating environment.

Feasibility

Driving simulator experiments will be performed to determine the efficacy of the alerting fragrance in a relevant context. Twenty sleep-deprived individuals will perform driving tasks in a simulator. Alerting fragrance (Moodify Red) or inactive substance will be administered during the driving tasks in a cross-over double-blind design. The key performance indicators of this project will relate to sleepiness reduction and sustained driver performance. Outcome measures are subjective and objective sleepiness, vigilant attention and driving performance. The project involves measurements of brain activity through electroencephalography (EEG), heart rate and heart rate variability through electrocardiography (ECG), and eye blinks through electrooculography (EOG).

Scope

- Proof-of-concept study in a driving simulator
- Recruitment of study participants
- Data collection
- Data processing and analysis

Profile

- Students with a background and/or interest in biomedical engineering, physiological measurement, or traffic safety
- Experience in signal processing and analysis
- Good knowledge of Matlab

Duration

- 1 semester
- Start January 2021
- Suitable for 1 or 2 students

Contact and application

- Send your application to anna.dahlman@vti.se

The Swedish National Road and Transport Research Institute (VTI), is an independent and internationally prominent research institute in the transport sector. Its principal task is to conduct research and development related to infrastructure, traffic and transport. The institute holds the quality management systems certificate ISO 9001 and the environmental management systems certificate ISO 14001. Some of its test methods are also certified by Swedac. VTI has about 200 employees and is located in Linköping (head office), Stockholm, Gothenburg and Lund.

