

*Brain Products Projects***FaSor (Fahrer als Sensor) - The driver as sensor***by Alexander Svojanovsky, Brain Products General Manager*

For the last 3 years, the FaSor project has been focusing on the interaction between driver, car and environment. Modern cars are equipped with various sensor technologies designed to increase both driver and traffic safety. Microsleep is one of the largest causes of accidents and of enough concern for the BMBF (Federal Ministry of Education and Research) to finance a project in which the driver contributed to the study of whether it is possible to detect levels of vigilance while driving. To help achieve this, Daimler rebuilt one of its flagship vehicles, the S-type Mercedes, which, of course, was filled with Brain Products equipment such as a 128-channel BrainAmp system. Alongside images from a variety of cameras (front, back, driver), other relevant data such as steering wheel movements, speed and distance measurements were recorded synchronously with EEG data during the course of numerous 8-hour driving sessions. The driver, wearing our EEG cap, acted as the additional sensor.

All the data from each session was analyzed on a statistical and scientific basis. The following sessions were then adapted in the light of the obtained data.

Our contribution consisted of developing techniques which make it possible to record reliable EEG data during real driving sessions in a car. Besides eliminating unexpected problems (seat heating) which interfere with the EEG, head movements (e.g. looking over one's shoulder) were the critical artifacts which had to be dealt with while also ensuring that the equipment was comfortable to wear.

All of the experience gained contributed to the development of a new actiCAP electrode cap which can be used to record top-quality data in real-life environments. It also prompted us to set up our own eXtreme EEG project to gain more experience of real-life recordings and provide a database containing videos, data and reports for scientists. Dry electrodes are also being studied as a parallel development.

We would like to thank all our partners for their enthusiasm and motivation and, in particular, Daimler and VDI/VDE-IT whose uncomplicated project administration was greatly appreciated.



Dr. Michael Schrauf, Daimler: Luggage trunk full of recording equipment



Online analysis and monitoring of driver's vigilance, BrainVision RecView modules programmed by Daimler