



## DRIVERBRAIN – Performance of drivers with cerebral diseases at unexpected incidents

Scientific Responsible  
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The objective of this research is the analysis of the performance of drivers with cerebral diseases at unexpected incidents. The basic cerebral diseases to be considered concern Cerebrovascular, Parkinson, Alzheimer and the Mild Cognitive Impairment at their early stages. The parameters considered include demographic, medical, neurological, neuropsychological, road and traffic parameters. These parameters are examined jointly in terms of driving performance for the first time internationally. A driving simulator experiment is carried out, comprising a medical/neurological and neuropsychological evaluation of the participants, and a set of driving tasks for different scenarios. The participants comprise two distinct groups from the general population: a group of individuals with cerebral diseases, and a group of healthy individuals. Models of driving performance are developed in order to identify and rank the parameters related to impaired driving. Models of road safety are also developed in order to quantify the impacts of impaired driving due to cerebral diseases and other parameters. Driver speed and vehicle position on the road lane are modeled in relation to demographic, medical / neurological, neuropsychological, road and traffic parameters. Moreover, driver reaction time and accident probability are modeled in relation to the above parameters, in the occurrence of unexpected incidents. A synthesis on impaired driving mechanisms is carried out, in which the impaired driving due to cerebral diseases and other related parameters are integrated both qualitatively (i.e. chains of events, impaired driving patterns) and quantitatively (i.e. magnitude and relative importance of effects). The results of the analysis allow for the identification of measures for the improvement of the performance of drivers with cerebral diseases e.g. restrictive measures, training and licensing, information campaigns, medical and neuropsychological monitoring etc.