The goal of this thesis was to process data from the project “Wakeful car, sleeping driver,” which were acquired during the period of 2000-2002. Furthermore, to obtain attributes from the data which would be appropriate for determination whether the driver is awake or tired. Moreover to evaluate the relevance of the attributes and to use them for automatic fatigue and alertness classification in drivers. The theoretical part describes fatigue as a physiological phenomenon and discusses the current state of research of the issue. The practical part then describes the experiment in which the data was obtained. This is followed by the description of the methodology of this study where signals of elektrooculography and the hall probe, which represented the steering wheel angle, were pre-processed in Matlab. Subsequently, the attributes were calculated from the individual signals and exported to MS Excel, where they were processed into the form of graphs and statistically evaluated. After the removal of irrelevant attributes automatic classification methods were used for discrimination between alertness and fatigue.