

Yawning Computing Using Bayesian Networks

Authors : Serge Tshibangu, Turgay Celik, Zenzo Ncube

Abstract : Road crashes kill nearly over a million people every year, and leave millions more injured or permanently disabled. Various annual reports reveal that the percentage of fatal crashes due to fatigue/driver falling asleep comes directly after the percentage of fatal crashes due to intoxicated drivers. This percentage is higher than the combined percentage of fatal crashes due to illegal/Un-Safe U-turn and illegal/Un-Safe reversing. Although a relatively small percentage of police reports on road accidents highlights drowsiness and fatigue, the importance of these factors is greater than we might think, hidden by the undercounting of their events. Some scenarios show that these factors are significant in accidents with killed and injured people. Thus the need for an automatic drivers fatigue detection system in order to considerably reduce the number of accidents owing to fatigue. This research approaches the drivers fatigue detection problem in an innovative way by combining cues collected from both temporal analysis of drivers' faces and environment. Monotony in driving environment is inter-related with visual symptoms of fatigue on drivers' faces to achieve fatigue detection. Optical and infrared (IR) sensors are used to analyse the monotony in driving environment and to detect the visual symptoms of fatigue on human face. Internal cues from drivers faces and external cues from environment are combined together using machine learning algorithms to automatically detect fatigue.

Keywords : intelligent transportation systems, bayesian networks, yawning computing, machine learning algorithms

Conference Title : ICECSE 2015 : International Conference on Electrical and Computer Systems Engineering

Conference Location : Montreal, Canada

Conference Dates : May 11-12, 2015