

Reduction of the Number of Traffic Accidents by Function of Driver's Anger Detection

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Abstract : When a driver happens to be involved in some traffic congestion or after traffic incidents, the driver may fall in a state of anger. State of anger may encounter decisive risk resulting in severer traffic accidents. Preventive safety function using driver's psychosomatic state with regard to anger may be one of solutions which would avoid that kind of risks. Identifying driver's anger state is important to create countermeasures to prevent the risk of traffic accidents. As a first step, this research figured out root cause of traffic incidents by means of using Internet survey. From statistical analysis of the survey, dominant psychosomatic states immediately before traffic incidents were haste, distraction, drowsiness and anger. Then, we replicated anger state of a driver while driving, and then, replicated it by means of using driving simulator on bench test basis. Six types of facial expressions including anger were introduced as alternative characteristics. Kohonen neural network was adopted to classify anger state. Then, we created a methodology to detect anger state of a driver in high accuracy. We presented a driving support safety function. The function adapts driver's anger state in cooperation with an autonomous driving unit to reduce the number of traffic accidents. Consequently, we evaluated reduction rate of driver's anger in the traffic accident. To validate the estimation results, we referred the reduction rate of Advanced Safety Vehicle (ASV) as well as Intelligent Transportation Systems (ITS).

Keywords : Kohonen neural network, driver's anger state, reduction of traffic accidents, driver's state adaptive driving support safety

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