

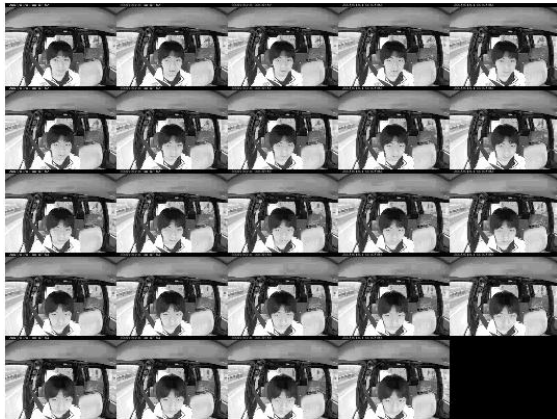


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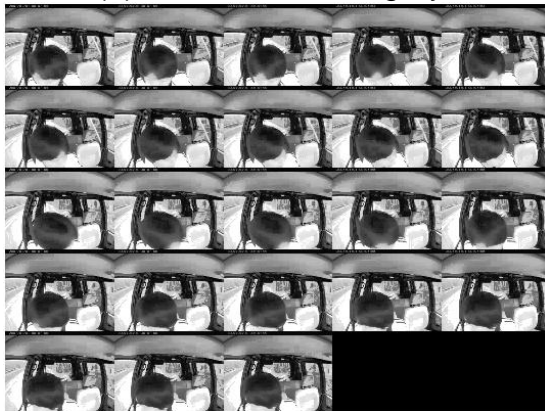
Safety Driving Assistance System using Driving Behavior

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Driver's Head Posture Categorization



(a) Frontal face category



(b) Deep head bending category

Head posture classification example..

Content:

This study aims to construct a driver assistance system that is able to detect such driver deviations. The system detects deviation using time-series head motion information. We analyze driver's head posture during safety verification and propose a method for classifying head posture using two types of unsupervised neural networks: Self-Organizing Maps (SOMs) and fuzzy Adaptive Resonance Theory (ART). The proposed method has a feature based on the hybridization of two unsupervised neural networks with a seamless mapping procedure. The proposed method can generate the optimal number of cluster-generated labels for the target problem. We experimentally assess the effectiveness of the proposed method by adjusting the fuzzy ART network vigilance parameters. In addition, we indicate that driver's head posture during safety verification can be categorized according to their individual properties.

Keywords: intelligent transport system, driving behavior analysis, machine learning

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