AI Powered Driver Fatigue and Drowsiness Detection System

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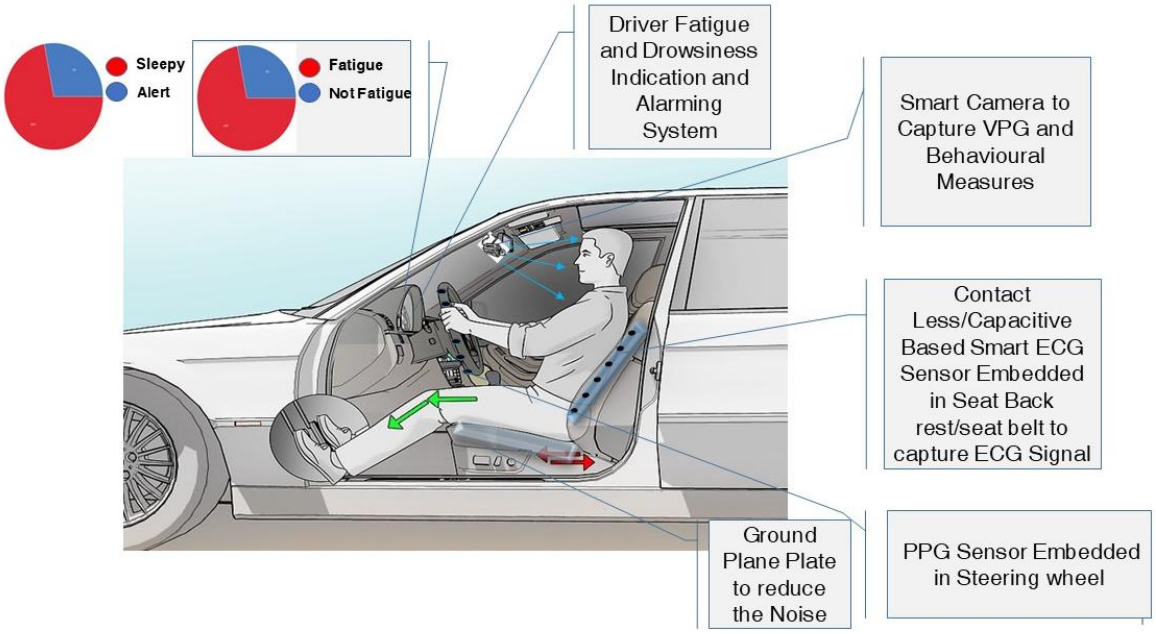
Fatigue and drowsiness are problems with severe consequences for drivers. Fatigue, drowsiness and lack of alertness contribute significantly to road accidents in India. Current attempts to implement fatigue/drowsiness detection for automobile drivers employ techniques such as blink frequency detection, posture/movement analysis, lane changes etc. However, the reliability of these methods is not very high due to varying lighting conditions and inherent person-to-person variation. Further, different road traffic, driving conditions makes these methods less accurate in the Indian scenario. Hence, **it is vital to develop accurate systems optimized to the Indian scenario to monitor fatigue and drowsiness levels**.

CSIR-CEERI is developing an AI powered Driver fatigue and drowsiness system by using ECG/PPG sensors attached at various locations (seat/backrest/steering wheel etc.) to continuously monitor physiological parameters non-intrusively. Customized hardware and electronic systems for obtaining accurate ECG/PPG signals non-invasively is being developed. These sensors are being combined with smart camera systems (Visible/IR) for acquiring both behavioral measures (distraction, head movements, eye lid closure, yawning etc.) and physiological measures (using video plethysmography). The data captured from these systems will be utilized to develop customized AI interfaces for the real-time monitoring & detection of driver fatigue and drowsiness.



Salient Features

- Multimodal collection of physiological signals to provide for redundancy in measurement & decision making
- Advanced signal/image processing algorithms combined with machine learning techniques optimized for Indian drivers to detect drowsiness & fatigue
- Resource constrained hardware & software development to ensure low cost of the system
- Easy, seam-less & scalable integration of system with existing automobile structure
- Validation of accuracy of systems by rigorous testing in lab environment and in real world conditions
- Predictive AI-based analytics for early warning systems to improve driver safety

Applications

- Fleet monitoring and management
- Call taxis (Ola/Uber)
- Public transport

CEERI is looking for industrial partners who can collaborate in the deployment of the technology, field-testing, customer insights and commercialization.

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