Support System for Preventing a Decline of Train Driver's Alertness Levels

Ayako SUZUKI Kei HOSHINO Masahiro HONDA Takeshi HARA

We developed a system to estimate train drivers' alertness levels from facial images and issue alerts. A laboratory experiment with general participants showed an accuracy of 80.1% for the eye region and 87.0% for the mouth region. Testing on operational trains confirmed accurate image capture and real-time alertness estimation under various lighting conditions. Using data from 13 operators, the model trained on 10 operators achieved 85.7% accuracy for the eye region and 71.9% for the mouth region when evaluated on the remaining 3. The alert sound received a high effectiveness rating of 5.3 out of 6, and device usability was rated 4.4 out of 5, demonstrating strong positive evaluations.