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(57) Abstract :
Extracting the vehicle trajectory from video monitoring is vital for identifying dangerous driving behavior and ensuring the safety of highway traffic. Using a vehicle's trajectory data consistently to detect dangerous driving is currently impossible. This endeavor seeks to create a detection system that can use data collected from road scenes to identify potentially risky driving behavior. The core components of this algorithm are the identification of potentially hazardous drivers, the extraction of relevant driving behaviors, and the creation of a recognition model for unsafe driving. This idea begins by calculating the vehicle's risk index in connection to five distinct unsafe driving behaviors: forceful lane changes, rapid acceleration/deceleration, excessive lateral movement, and unsafe following. After applying numerous methods to perform anomaly detection on the drivers' risk indicators, such as K-means clustering, local factor anomaly algorithm, isolation forest, OneClassSVM, and CNN, we recommend the most effective method for identifying dangerous drivers. The characteristics of the driver's behavior are then calculated using the Fourier transform of the vehicles' velocities and accelerations. This research takes into account the imbalanced nature of the analyzed dataset, which contains just a small percentage of problematic drivers, and explores numerous unbalanced classification approaches to enhance the performance of recognizing unsafe driving behavior. Results show that unsafe driving behavior may be detected using the OneClassSVM detection method. The improved Xgboost algorithm does well with the highly imbalanced data of risky drivers.

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