

# Driving Through a Bend: Detection of Unsafe Driving Patterns and Prevention of Heavy Good Vehicle Rollovers

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**Abstract**—Road Traffic Crashes are simply ordinary within the present world. However, heavy goods vehicles (HGV) rollover has become a significant problem worldwide. Depending on the data collected, the sources used, and several key factors contribute to HGV overturning. Accidents overturn due to longer reaction time, shriveled driving performance, lack of driving experience, and driver carelessness. In further consideration, over-steering to turning over, not steering enough to stay in lane, over speed, high located center of gravity, weather condition, road condition, and the road's curves are the most contributing reasons to the overturning of a long vehicle. Thus, this paper proposes machine learning processes to overcome these problems and reduce the HGV rollovers. The proposed system includes a vehicle-equipped system and a ground-based operational surveillance camera. The Vehicle-equipped system can determine the safe speed at which the vehicle should travel according to the type of vehicle and curvature of the road and can detect road cracks and notify the driver by sending the notification to the vehicle dashboard screen. The ground-based driver support system can detect safe speed for HGVs and determine various other traffic parameters which can affect the HGV rollover accidents.

**Keywords**— *Artificial intelligence, Object detection, Machine learning, Road cracks detection, Vehicle-equipped system, Ground-based driver support system*