

Multi-actuators vehicle collision avoidance system - Experimental validation

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ABSTRACT

The Insurance Institute for Highway Safety (IIHS) of the United States of America in their reports has mentioned that a significant amount of the road mishaps would be preventable if more automated active safety applications are adopted into the vehicle. This includes the incorporation of collision avoidance system. The autonomous intervention by the active steering and braking systems in the hazardous scenario can aid the driver in mitigating the collisions. In this work, a real-time platform of a multi-actuators vehicle collision avoidance system is developed. It is a continuous research scheme to develop a fully autonomous vehicle in Malaysia. The vehicle is a modular platform which can be utilized for different research purposes and is denominated as Intelligent Drive Project (iDrive). The vehicle collision avoidance proposed design is validated in a controlled environment, where the coupled longitudinal and lateral motion control system is expected to provide desired braking and steering actuation in the occurrence of a frontal static obstacle. Results indicate the ability of the platform to yield multi-actuators collision avoidance navigation in the hazardous scenario, thus avoiding the obstacle. The findings of this work are beneficial for the development of a more complex and nonlinear real-time collision avoidance work in the future.

KEYWORDS:

Actuators; Braking; Collision avoidance; Hazards; Highway engineering