Editorial

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Biographical notes: Yuping He received his PhD in Mechanical Engineering from the University of Waterloo, Canada, in 2002. From 1995 to 1998, he was with Beijing Institute of Technology as an Associate Professor. In 2006, he joined the University of Ontario Institute of Technology (UOIT), where he is now an Associate Professor in Automotive Engineering. His research interests are mainly in vehicle system dynamics, design optimisation, and active safety systems. He won a research excellent award at UOIT in 2010. He is an Editorial Board Member for four international journals. He is a Member of SAE, ASME and CSME.

Modern road vehicle design and development bears the following distinguished features:

- human factor and ergonomic consideration
- occupant and road safety enhancement
- multidisciplinary design exploitation.

The interactions of driver-vehicle-road have been explored in defining and evaluating various performance measures of closed-loop vehicle dynamic systems. Extensive attention has been paid to understand the human driving behaviour. However, developing effective and feasible driver models for closed-loop vehicle dynamics system analysis is still a challenging task.

In order to increase occupant and road safety, various active control systems, such as active/semi-active suspensions, active steering, vehicle stability control, and active roll control, have been proposed, developed and applied to road vehicles. Although these individual active safety systems may achieve their own objectives and to execute relevant functions to improve specific performance measures, no single system can keep a road vehicle agile and stable under wide operating conditions. To ensure safe operations under various manoeuvres including emergency scenarios, individual active control systems may be coordinated in an integrated manner. Commercial vehicles and, in particular, articulated heavy vehicles (AHVs) have unique physical and performance characteristics compared to single-unit ones. AHVs have multiple vehicle unit structures, high centres of gravity, and large sizes, which result in poor manoeuvrability at low speeds. On the other hand, AHVs exhibit unstable motion modes at high speeds, including jack-knifing, trailer swing, and rollover. The poor directional performance of commercial vehicles raises concerns about traffic safety and damage to road infrastructure. To reduce the hazards

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associated with road vehicles, multidisciplinary investigations, such as human driver attributes, active safety systems, and coordination or integration of individual active control systems, will lead to promising solutions.

This special issue is intended to present new and original research on road vehicle safety and performance. This issue includes five papers focused on

- A hierarchical integrated chassis control strategy based on wheel force feedback
- Cargo securement methods and vehicle braking performance
- Analysis of the impact of a detached heavy trailer against a concrete median barrier
- Multi-input multi-output intelligent modelling techniques and application to human driver
- Coordinated control of active steering and active roll control systems for enhanced vehicle lateral dynamics.

I believe that these papers will offer valuable references for readers in the field of vehicle safety and performance analyses. I would like to thank the authors for their contributions and the reviewers for their invaluable time and efforts.