



Call for Papers for Open Invited Track on
Eco-Driving: Energy Efficient Driving by Optimizing Vehicle Speed

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Improving energy efficiency of vehicles is an important topic of research for the automotive industry. For traditional and hybrid vehicles, a better energy efficiency leads to lower fuel cost and lower emissions. Similarly, improving efficiency of electric vehicles leads to an extension of the vehicle's driving range, thereby mitigating range anxiety.

A significant amount of research in the control systems community has been on optimizing the energy efficiency of the vehicle's powertrain and auxiliaries by improving the vehicle's energy management system. In most of the work on vehicle energy management, the vehicle speed is assumed to be given (i.e., it is known, or it is estimated/predicted). Since most of the power generated by the powertrain is used for propelling the vehicle, optimizing the vehicle speed over a certain trajectory can lead to a considerable reduction in energy consumption. The potential energy reduction has contributed to the emergence of the so-called eco-driving concept, which aims to increase the energy efficiency of a vehicle by means of a convenient selection of driving strategies. Eco-driving can be implemented as an Eco-Driving Assistance System (EDAS), in which the driver receives suggestions to adjust the driving style, as an adaptive cruise control system (ACC), or as a part of a fully autonomous vehicle controller.

This invited track intends to bring together researchers in academia and industries working on the emerging topic of eco-driving. Submissions based on original research are cordially invited. The topics of interest include but are not limited to:

- Off-line optimization methods for eco-driving, e.g., focusing on handling discrete/binary decisions, or addressing the curse of dimensionality of dynamic programming
- On-line optimization methods for eco-driving, e.g., based on Model-Predictive Control schemes
- Methods to predict the motion of leading vehicles and the surrounding traffic
- Eco-driving combined with energy management to further improve efficiency of the vehicle
- Optimizing the energy usage of fleets of vehicles: cooperative eco-driving, including platooning
- Machine learning and artificial intelligence methods applied to eco-driving
- Control-oriented modelling for eco-driving
- Testing and simulation tools for eco-driving, e.g., the use of microscopic traffic simulators.

Submission Information

This open invited track welcomes both regular papers (6-8 pages) and extended abstracts (short papers of 2-4 pages, to appear in the congress preprints but not in IFAC PapersOnLine). The code for submission is **s3gh3**. The conference program committee will decide the placement of the accepted contributions into the open invited track or the regular program. Further information about submission is available at www.ifac2020.org.

Manuscript submission: 31 October 2019