Research and Innovation Center of Excellence

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Room 010, Social Facilities Building 7,
University of Cyprus

KIOS Distinguished Lecture Series

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Multi-level control of large-scale traffic networks

LECTURE ABSTRACT

In this presentation we will give an overview of the work done at the Delft Center for Systems and Control in the field of traffic management and control. The main focus is on how model-based predictive control (MPC) can be used to obtain a balanced trade-off between reduction of total time spent, emissions, and fuel consumption in large-scale road traffic networks. We address several methods to deal with the computational complexity issues arising in model-based control of large-scale road traffic networks, such as choosing appropriate traffic flow models, using parametized control, distributed or multi-level control, and the right optimization approach. We consider in particular on multi-level, multi-agent traffic control with coordination within and across all control levels. We explain how model predictive control can be used at several levels of the control hierarchy. The proposed multi-level architecture provides a scalable approach for control of large-scale traffic networks where at different levels of the hierarchy different temporal and spatial scales are taken into account.

BRIEF BIO

Bart De Schutter received the PhD degree in Applied Sciences in 1996, at K.U.Leuven, Belgium. After obtaining his PhD degree, he was a postdoctoral researcher at the SISTA-ESAT group of K.U.Leuven, Belgium. In 1998 he moved to the Control Lab of Delft University of Technology as an assistant professor. In 2000 he became associate professor. Currently, he is a full professor and head of department at the Delft Center for Systems and Control of Delft University of Technology in Delft, The Netherlands.

Bart De Schutter is associate editor of IEEE Transactions on Automatic Control and senior editor of the IEEE Transactions on Intelligent Transportation Systems. His current research interests include control of discrete-event and hybrid systems, multi-agent systems, control of large-scale transportation networks with applications in freeway and urban traffic control, intelligent vehicle systems, smart grids, and water networks.

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