

## Department of Electrical and Computer Engineering

**Title:** «Performance of coordinated-distributed prediction of traffic flow in a motorway network»

**Prof. Jan H. van Schuppen (Emeritus)**  
Control Research/Delft University of Technology

**Wednesday, 22<sup>th</sup> January 2014, 17:30 – 18:30**  
**Room KENTP. - A008, Old Campus**  
**University of Cyprus**

### **Abstract:**

At traffic control centers in The Netherlands there is a need to produce online predictions of traffic flow in motorway networks. The predictions are needed to detect future troublesome traffic situations, to evaluate control scenarios, and to compute online control inputs. The coordinated-distributed prediction algorithm for traffic flow in a motorway network has two levels. At the lowest level there are many subnetworks each of which produces predictions of traffic flow based on an assumption of traffic inflows from motorways. At the highest level there is a coordinator of all subnetworks who by an iterative procedure achieves that the traffic outflows of all subnetworks approximately equal the traffic inflows of corresponding other subnetworks. The performance of the prediction program for a road network of moderate size near Amsterdam in a distributed simulation environment is very good with a computation time of approximately 0.03 seconds to predict traffic flow over a 30 minute horizon. Several research issues on coordinated-distributed prediction will be presented as well as planned research on control of traffic flow in road networks.

### **Biography:**

Jan H. van Schuppen is since 1 October 2012 affiliated as researcher with the the company Van Schuppen Control Research in Amsterdam and as professor emeritus with the Department of Mathematics of the Delft University of Technology in Delft, The Netherlands. Formerly he was primarily affiliated with the research institute Centrum voor Wiskunde en Informatica (CWI) in Amsterdam, The Netherlands. Van Schuppen's research interests include control of distributed and of multilevel systems, control of discrete-event systems and of hybrid systems, stochastic control, realization, and system identification. In applied research his interests include engineering problems of control of motorway traffic, and control and system theory for the life sciences. He is Advisory-Editor of the journal Mathematics of Control, Signals, and Systems (MCSS), was Associate Editor-at-Large of the journal IEEE Transactions Automatic Control, and was Department Editor of the journal Discrete Event Dynamic Systems. He was and is the advisor of 18 Ph.D. students, 12 post-docs, and 9 master level students. Finally, he was also the coordinator of the EU-financed C4C Project (CON4COORD, Grant agreement INFSO-ICT-223844).