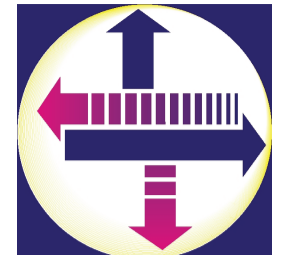


HALF DAY SEMINAR ON: MODELING AND CONTROLLING TRAFFIC CONGESTION AND PROPAGATION IN LARGE-SCALE URBAN MULTI - MODAL NETWORKS



HELLENIC INSTITUTE
OF TRANSPORT
CERTH / HIT

Prof. Nikolas Geroliminis / Urban Transport Systems Laboratory, EPFL

Instead of the micro-modeling approach of traffic congestion, the network macroscopic fundamental diagram (MFD) aims to simplify the complex micro-modeling task of the urban network where the collective traffic flow dynamics of sub-networks capture the main characteristics of traffic congestion, such as the evolution of space-mean flows and densities in different regions of the city. The MFD can be utilized to introduce elegant control strategies to improve mobility and decrease delays in large urban networks, that local ones are unable to succeed. We develop methodologies to model and understand the collective behavior for different types of urban systems, with emphasis in conflicts for the same road space. Regularity conditions for well-defined MFDs are discussed. We also develop optimization tools and investigate what type of real-time active traffic management schemes (congestion pricing, vehicle restriction, large scale traffic signal control, dynamic bus lanes) can improve mobility measures in a city for cities of different structures. We build a hierarchical feedback control network of multiple levels. The validation of the modeling methodologies and the traffic management schemes are conducted in various and complex city structures scenarios using large data sets from field experiments and advanced micro-simulations.

October 16 2013

16:00-19:00

**HELLENIC INSTITUTE
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Lecture 1: Urban network modeling for vehicular traffic

Lecture 2: Urban network control for vehicular traffic

Lecture 3: Modeling and control for multimodal systems



Short Bio:



Nikolas Geroliminis is an Assistant Professor at EPFL and the director of the Urban Transport Systems Laboratory (LUTS). He has a diploma in Civil Engineering from the National Technical University of Athens (NTUA) and a MSc and Ph.D. in civil engineering from University of California, Berkeley. Before joining EPFL he was an Assistant Professor on the faculty of the Department of Civil Engineering at the University of Minnesota. He is a member of the Transportation Research Board's Traffic Flow Theory Committee. He also serves in the editorial board of Transportation Research, part B and C, Journal of ITS and other journals. His research interests focus primarily on urban transportation systems, traffic flow theory and control, public transportation and logistics. He is a recent recipient of the ERC Starting Grant "METAFERW: Modeling and controlling traffic congestion and propagation in large-scale urban multimodal networks"