

Modelling Reduction Tools for Large Scale Complex Networks



ERC Scale-FreeBack, Workshop, 21-22 Sept 2017, Grenoble France



Scientific Committee: Carlos Canudas-de-Wit (CNRS), Sandro Zampieri (Univ. Padova, Italy), Benjamin Seibold (Univ. Temple, USA), Paolo Frasca (CNRS), Maria Laura Delle Monache (INRIA), Giacomo Casadei (CNRS)

Local organization: Leon Lydie (CNRS), Myriam Etienne (INRIA)

Location: A small castle near to Grenoble, Château la Commanderie (<http://www.commanderie.fr/?lang=en>)

The workshop, organized within the context of the ERC-AdG Scale-FreeBack project (scale-freeback.eu), aims to investigate problems of modelling, model reduction, aggregation for large-scale dynamical systems and their application to traffic networks. Large-scale systems embed intrinsic issues in terms of computational complexity, which make their analysis and the definition of control architecture difficult.

Topic 1: Modelling of Large Scale Complex Networks (50 min. open talks): General properties of large-scale networks and different perspectives: phase transition, scale free dynamic networks, graphs and network analysis.

Agenda of the presentations:

09h00 - 10h00: Mauricio Barahona (Imperial College) “Dynamical coarse-graining and graph partitions in networked systems”

10h00 - 10h30: Coffee Break

10h30 - 11h30: Marc Barthélemy (CEA Paris) “Characterization of spatial networks”

11h30 - 12h30: ERC Scale-FreeBack: **Sandro Zampieri** (University of Padova) “Controlling complex networks and by partitioning”

12h30 - 14h00: Lunch Break

Topic 2: Model Aggregation/Reduction for Large Scale Networks (50 min. open talks): Model reduction and aggregation, control theory and their application to large-scale networks.

Agenda of the presentations:

14h00 - 15h00: Arjan van der Schaft (University of Groningen) “Reduction of network models of physical systems”

15h00 - 16h00: Jun-ichi Imura (Tokyo Institute of Technology) “Clustered Model Reduction of Large-scale Networks and its Application to Control”

16h00 - 16h30: Coffee Break

16h30 - 17h30: ERC Scale-FreeBack (Grenoble): **Nicolas Martin** “On scale-free-mindful graph aggregation”

19h30 - 22h00: Social Dinner at the Workshop Venue

Topic 3: Modelling of Large Scale Spatial/Temporal Traffic Networks (25 min. open talks): Modelling tools for large-scale traffic networks and techniques to simplify their dynamic representation and their analysis.

Agenda of the presentations:

09h30 - 10h00: Ludovic Leclercq (IFSTTAR) “Dynamic modelling of large-scale urban networks: a MFD approach”

10h00 - 10h30: Luis Miguel Romero Pérez (University of Sevilla) “Traffic Flow in Dense Urban Areas by Continuum Modelling”

10h30 - 11h00: Coffee Break

11h00 - 11h30: ERC Scale-FreeBack: **Benjamin Seibold** (Temple University) “2d Traffic Flow Modeling via Kinetic Models”

11h30 - 12h00: ERC Scale-FreeBack: **Stéphane Mollier** “2D Macroscopic model for traffic flow”

12h30 - 14h00: Lunch Break and Farewell



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