Analysis and Control of Large Scale Complex Networks

ERC **Scale-FreeBack**, Workshop, 10-11 Sept 2018, Grenoble France

Scientific Committee: Carlos Canudas-de-Wit (CNRS), 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)

Registration: here

The workshop, organized within the context of the ERC-AdG Scale-FreeBack project (scale-freeback.eu), aims to investigate problems of modelling, estimation and control of large-scale dynamical systems. 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 & Model Aggregation

09h00 - 09h30: **Carlos Canudas-de-Wit** ERC Scale-FreeBack Goals & Objectives,

09h30 - 10h00: **Nicolas Martin,** Carlos Canudas De Wit, Paolo Frasca**.** ERC Scale-FreeBack:" Large-scale network reduction towards scale-free structure"

10h00 - 10h30: Coffee Break

10h30 - 11h30: **Jacquelien Scherpen** (Groningen Uni.) "Structure preserving order reduction of networked linear systems"

11h30 - 12h30: **Ming Cao** (Groningen University) "Modeling and control of evolutionary network dynamics"

12h30 - 14h00: Lunch Break

Topic 2: Estimation & Observation

14h00 - 15h00: **Didier Georges** (Gipsa-Lab Grenoble INP), "Optimal sensor location for large-scale dynamical systems"

15h00 - 16h00: **Francesco Viti** (Luxembourg University), "Assessing partial observability in sensor location problems at large-scale networks"

16h00 - 16h30: Coffee Break

16h30 - 17h00: **Muhammad Niazi,** Carlos Canudas De Wit, Alain Kibangou. ERC Scale-FreeBack: "Average State Estimation of Multiple clusters in Large-Scale Network Systems".

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

Topic 3: Control Design

09h30 - 10h30: **Anders Rantzer** (Lund University), "When are optimal controllers scalable?"

10h30 - 11h00: Coffee Break

11h00 - 12h00: **Rodolphe Sepulchre** (Cambridge University), "Ultrasensitivity and robust control across scales"

12h00 - 12h30: **Giacomo Casadei**, Carlos Canudas De Wit, Sandro Zampieri. ERC Scale-FreeBack: "Scale Free Controllability of Large-Scale Networks: an Output Controllability Approach".

12h30 - 14h30: Lunch Break and demonstration/posters on Traffic Lab, modelling and Estimation. **Vadim Bertrand, Nicolas Martin, Stephane Mollier**

14h30 - 15h30: Claudio De Persis (Groningen University). "Semi-decentralized integral control for computing Nash equilibria in aggregative games or on optimal control of flow networks with constraints."

15h30 - 16h30: Murat Arcak (Berkeley University). "Network partitioning and aggregation for hierarchical control"

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