Toulouse Complex Network (WP3)
(4-day workshop)

Advanced mathematics for network analysis

Sunday May 1, 2016 – Wednesday May 4, 2016
Hôtel Le Majestic ***
Boulevard Amédée Fontan,
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Organizers: C Bordenave (IMT), S Cafieri (ENAC), E Fieux (IMT), B Georgeot (LPT), B Jouve (FRAMESPA/IMT), N Villa-Vialaneix (INRA MIAT)

http://www.isc-t.fr

Aim and Scope:

The analysis of relational aspects in data provides access to a point of view that is not accessible by usual statistical methods on individuals/variable matrices. When it is justified, the construction of relational data allows us to analyse structural properties, local or global: neighbourhood, density of links, degree and centrality of a node, length of shortest path, … The graph, as a mathematical object, is the natural model for that type of data and graph theory is a source of tools for network analysis. However, graph theory is seldom used in its full power for the analysis of real networks, due to the scope of the theory and the diversity of the results and tools that have been developed. In this workshop, expert researchers will give lectures in order to present recent directions and advanced tools for network analysis, particularly in order to deal with the dynamics, the critical states, the break-up mechanisms or the micro-meso-macro transitions. One session will also be dedicated to short presentations by the participants and another one will be reserved to business use cases. Researchers from companies are welcome to attend.

Registration:

The workshop is open but registration is necessary. To register, please fill in the form available from the website http://www.isc-t.fr.
Each participant, except the invited speakers, will have to pay lodging. Lunches are offered.
Collective transportation form Toulouse to Luchon and back will be provided on April 30 and May 4.
Some supports, particularly for PhD students, are available. To apply, please send an Email to jouve@univ-tlse2.fr in which you detail you research and the motivation for support in a half page, and send it before the 1st of March 2016

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Program:

	morning	afternoon
1/5/2016	**9H00-10H30 : complex networks** Bertrand Jouve (FRAMESPA/IMT, Toulouse) http://blogs.univ-tlse2.fr/jouve/ Eric Fleury (LIP, ENS Lyon) http://perso.ens-lyon.fr/eric.fleury/	**14H00-15H30 : complex networks and economics** Agnieszka Rusinowska (PSE, Paris) http://ces.univ-paris1.fr/membre/Rusinowska/
	11H00-12H30 : random models 1 Charles Bordenave (IMT, Toulouse) (random matrix theory) http://www.math.univ-toulouse.fr/~bordenave/	**16H00-17H30 : models of communication networks** Florian Simatos (ISAE, Toulouse) (renormalisation on graphs) http://personnel.isae.fr/florian-simatos/
2/5/2016	**9H00-10H30 : network decomposition 1** Ararat Harutyunyan (IMT, Toulouse) (spectral analysis, coloring) http://people.maths.ox.ac.uk/harutyunyan/	**14H00-15H30 : complex networks and biology** Etienne Birmelé (MAP5, Paris) *(to be confirmed)* http://www.math-info.univ-paris5.fr/~ebirmele/
	11H00-12H30 : random models 2 Bertrand Georgeot (LPT, Toulouse) (google matrix: theory and applications) http://www.lpt.ups-tlse.fr/spip.php?article28	**16H00-18H00 : applications: business use cases session**
3/5/2016	**9H00-10H30 : network decomposition 2** Sonia Cafieri (ENAC, Toulouse) (optimisation of clustering) http://www.recherche.enac.fr/~cafieri/	**14H00-15H30 : graph mining 2** Nathalie Villa-Vialaneix (INRA, Toulouse) http://www.nathalievilla.org/
	11H00-12H30 : graph mining 1 Pierre Borgnat (Lab Phys, ENS Lyon) (signal processing on graphs) http://perso.ens-lyon.fr/pierre.borgnat/	**16H00-18H00 : short talks** by the participants
4/5/2016	**9H00-10H30 : hereditary properties 1** Etienne Fieux (IMT, Toulouse) (k-dismantlability)	
	11H00-12H30 : hereditary properties 2 Patrice Ossona (CAMS, Paris) (sparsity) http://cams.ehess.fr/pom/ Jaroslav Nesetril (ITCS, Prague) http://kam.mff.cuni.cz/~nesetril/en/	