Activity Report for the CSS TC on Networks and Communication Systems (TC-NetComs)

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There has been an increasing volume of research on networks within the CSS community. This research is not confined to work on traditional communication networks, but also extends to a broader set of networks including other technological networks such as transportation and energy networks, social, economic, and financial networks, and biological networks.

During CDC 2011 in Orlando, there have been many sessions focusing on networks. These include multiple sessions on dynamics over complex networks, communication networks, game theory (as applied to networked systems), cooperative control, agents and autonomous systems, transportation networks, consensus algorithms, cooperative control and distributed optimization, sensor networks, electrical power systems and energy systems.

Our TC, chaired then by Yannis Paschalidis, hosted a lunch meeting inviting all Working Group Chairs and several key members of the CSS community with significant research activities in the networks area. The meeting was well attended and several topics were discussed, including future activities and publications within the CSS community that could serve as a good venue for networks related research.

We next outline some additional activities to which TC members are involved and in many cases responsible for organizing. More information and links to some of these events are at the TC website, http://ionia.bu.edu/CSS-TC/activities.html

On behalf of the TC, Paschalidis gave a presentation to the BoG during the CDC 2011 BoG meeting. In this presentation he highlighted recent TC activities and discussed the evolution of research areas in networks that are attracting interest from CSS researchers. He brought up the need for more visible coverage of these emerging areas by CSS publications.

A TAC special issue on "Social and Economic Networks" is being discussed among some of the TC members. A special issue proposal on this topic will be submitted soon.

Jadbabaie, Ozdaglar, and Tatikonda are on the TPC of the 3rd IFAC Workshop

on Distributed Estimation and Control in Networked Systems (NecSys'12), September 14-15, 2012, Santa Barbara, California.
(see http://necsys2012.engr.ucsb.edu/)

Tatikonda is an invited speaker at the LCCC focus period on Information and Control in Networks, in the workshop held on Oct 17-19, 2012, organized by the Linnaeus excellence center LCCC (www.lccc.lth.se) at Lund University, Sweden. The workshop is the culmination of a five week focus period (Oct 1 - Nov 2) devoted to Information and Control in Networks.

Marbach was the TPC co-chair of the workshop "Wireless Networks: Communication, Cooperation and Competition" that was held at the WiOpt conference 2011 in Princeton.

The workshop focused on cooperation and resource management in large-scale wireless networks, including both mobile and static networks. Approaches to cooperation and resource management across the protocol layers were considered, ranging from physical layer to application layer issues.

Marbach is a co-organizer of BIRS Banff workshop on "Asymptotics of Large-Scale Interacting Networks" to be held from February 24 to March 1, 2013, in Banff, Canada.

The focus of the workshop is interacting networks where agents infer and act on local viewpoints, with global consequences. Of particular interest are scenarios where either the number of agents, or the size of the inference problem, is large and the system behavior can be characterized by an asymptotic analysis. Interacting networks with these properties arise in several contexts such as biological networks, financial and economic networks, social networks, and energy and communication networks. The aim of the workshop is to bring together leading researchers in this area to discuss recent results and open problems and to explore new mathematical techniques and models to study these problems. In addition, the workshop will give some outstanding junior researchers an opportunity to present their own research and become engaged in this field.

Marbach was/is on the TPC for Infocom 2011,2012,2013, for ACM MobiHoc 2012, and ACM Conext 2012.

Jadbabaie and Ozdaglar are recipients of a 2012 Multidisciplinary University Research Initiative (MURI) Award for their project "Evolution of Cultural Norms and Dynamics of Socio-Political Change". The project will include collaborations with researchers at Cornell, MIT, Stanford and Georgia Tech. It will draw on network science, game theory, economics and political science to design an analytical framework for analysis and prediction of various socio-political phenomena including political change, social norms, cultural dynamics, and societal transformations.

Jadbabaie's work with Victor Preciado on "Moment-based analysis of spreading processes from network structural information" was featured in L'Atelier (a French weekly magazine)
http://www.atelier.net/trends/articles/letude-dun-fragment-de-reseau-renseig ne-etendue

Jadbabaie is the co-director of the "Singh Program on Market & Social Systems Engineering", which is a new undergraduate program at UPenn that focuses on the study of networked interactions, including the interplay of technology, algorithms, economics, and sociology. (see http://www.mkse.upenn.edu/)

Ozdaglar is a plenary speaker at the International Conference on Game Theory, Stony Brook University, New York, NY, July 2012.

Ozdaglar is an invited speaker at the 3rd IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys'12), September 2012.

Ozdaglar is a keynote speaker in the 6th International ICST Conference on Performance Evaluation Methodologies and Tools (ValueTools 12), Corsica, October 2012.

Ozdaglar was the organizer of 3 sessions on "Dynamics in Complex Networks" in CDC 2011.

Ozdaglar is a co-organizer of the Interdisciplinary Workshop on Information and Decision in Social Networks II, together with Sandy Pentland, Devavrat Shah, and John Tsitsiklis, November 12-13, 2012.

Recent technological and mathematical developments have opened the possibility to considerably improve our understanding of how information flows and decisions are made in large social networks. In this workshop, we bring together researchers from different communities working on information propagation and decision making in social networks to investigate both rigorous models that highlight capabilities and limitations of such networks as well as empirical and simulations studies of how people exchange information, influence each other, make decisions and develop social interactions.

Ozdaglar was a co-organizer of the Interdisciplinary Workshop on Information and Decision in Social Networks, together with Vincent Blondel, Munther Dahleh, and John Tsitsiklis, May 31-June 1, 2011.

Ozdaglar was a co-organizer of the ACM Workshop on the Economics of Networks, Systems, and Computation (NetEcon 11), together with John Douceur, June 6, 2011.

Ozdaglar is the area co-editor (together with David Gamarnik) of a new area "Games, Decisions and Networks" within the journal Operations Research. Jadbabaie and Paschalidis are associate editors for this area.

Paschalidis served in the TPCs of WiOpt 2012, MED 2012, NecSys 2012, and CDC 2012.

Paschalidis was a co-organizer of the Symposium "Systems Science: Shaping Society's Future" held at Boston University on May 10, 2012. The Symposium featured a number of CSS field metalists and drew an audience of more than 120 people from academia, government, and industry. Details are at http://www.bu.edu/systems/cise-10th-anniversary-symposium/.

Several invited sessions in Networks have been proposed for CDC 2012.