Report of the IEEE CSS TC on CACSD

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Here is a summary of the activities of the TC during the second semester of 2010.

\*\*\* Meeting \*\*\*

An informal meeting of the TC-CACSD was organized during the 2010 IEEE-MDC

in Yokohama. The meeting took place on Friday September 1. Action Groups Chairs

were invited.

\*\*\* New webpage of TC-CACSD

A new webpage for TC-CACSD has been published online in August 2010. The new webpage is completely redesigned. Also, a common template for the various Action Group webpages has been prepared and distributed to the AG Chairs, who are updating their respective pages to this format with the aim of obtaining a uniform look and structure of all AG webpages.

The address of the new page is http://staff.polito.it/fabrizio.dabbene/TC-CACSD/

A redirect link to this new homepage has been added at the old address

http://www.laas.fr/cacsd/

(since this latter page still shows up first in a Google search).

\*\*\* 2010 CACSD Symposium \*\*\*

The 2010 CACSD Symposium has been held during the 2010 IEEE Multi-conference on Systems and Control that will take place in Yokohama, Japan on September 8-10, 2010. The conference hosted a track on Systems with Uncertainty, in collaboration with TC-SU.

The Symposium received around 100 submissions, between Invited and Contributed Paper. The acceptance rate of the CACSD Symposium has been 72% (60% for Contributed Papers and 89% for Invited Papers). Plenary speaker for the Symposium will be Prof. M. Vidyasagar.

The sessions were very well attended, with an average of 30 attendees for session.

Most authors were present at the symposium, and a single no-show was registered

Starting from this years, the program committees decided to invite preminent researches to organize tutorial sessions on selected topics of specific interest to the conference audience. Two tutorials were organized for the CACSD Symposium:

Mario Sznaier organized a tutorial session titled "The Role of Systems Theory in Computer Vision" and Athanasios C. Antoulas one on the topic of "Recent Advances in Model Reduction of Large-Scale Systems."

There were two workshops organized for the CACSD Symposium: a full-day workshop organized by Graziano Chesi, chair of the TC-SU and titled "Systems with Uncertainty," ratifying the joint collaboration between the TC-CACSD and TC-SU, and an half-day workshop organized by Marco Lovera and Francesco Casella from Politecnico di Milano on the topic of

"Integrated Modeling and Parameter Estimation: An LFR-Modelica Approach".

\*\*\* 2011 CACSD Symposium \*\*\*

The 2011 IEEE Multi-Conference on Systems and Control, that will be held

in Denver, Colorado, on September 28 - 30, 2011. MSC 2011, will include

for the first time a Joint Symposium on Computer-Aided Control System Design (CACSD) and Systems with Uncertainty (SU). The Program Chair of theJoint CACSD-SU is Graziano Chesi.

\*\*\* Action Groups \*\*\*

- New Action Group on Distributed Optimization and Control -

Giuseppe Calafiore has been invited to start a new Action Group on Distributed Optimization and Control. The main topics of this new Action Group include: distributed optimization, multi-agent systems, decentralized control, and consensus.

The AG has just been opened, and invited members of this new AG still have to confirm their participation. However, the AG chair is making converge into the AG the activities of three research groups from Politecnico di Torino working on large-scale and distributed optimization, under funding from a project from the Italian Ministry of Education and Research, titled ‘Large-scale and distributed systems: optimization, estimation and control, with applications.’

- New name of the LMI AG -

The AG on LMIs, chaired by Yoshio Ebihara and Dimitri Peaucelle, changed its name into "Convex Optimization for System Analysis and Control Design". This reflects a broadening of the AG scope, that will include in its main research topics the recently developed convex relaxation techniques for polynomial and algebraic optimization problems, based on SOS and moment approaches.

- New Chair of AG on Multidisciplinary System Simulation -

Francesco Casella recently took over the Chairing position of the Action Group on Multidisciplinary System Simulation. The intention is to broaden the scope of the AG including topics related to simultaneoous modeling and identification.

- New Chair of AG on PRMC -

Constantino Lagoa recently took over the Chairing position of the Action Group on Probabilistic and Randomized Methods in Control.

- New Chair of AG on Hybrid Dynamical Systems -

Pieter Mosterman stepped down from the Chairing position of the Action Group on Hybrid Dynamic Systems. I invited Xue Liu to take over the chairing responsabilities, who accepted. Xue invited Prof. Sayan Mitra from Univ. of Illinois at Urbana-Champaign to co-chair the AG. Prof. Mitra is an expert in HDS, his join will be very helpful in enriching the AG activities.

\*\*\* Publications \*\*\*

The research activity of the AG on Distributed Optimization and Control has just started, but the AG chair's own research group already developed some specific approaches for distributed estimation, that lead to various publications, as listed below:

G.C. Calafiore, L. Carlone, and M. Wei, “Network localization from range measurements: algorithms and numerical experiments”, in Proceedings of the 2010 IEEE Conference on Cybernetics and Intelligent Systems (CIS), pages 225-230, 2010. ISBN 978-1-4244-6499-9

G.C. Calafiore, L. Carlone, and M. Wei, “Position estimation from relative distance measurements in multi-agents formations”, in Proceedings of the 2010 18th Mediterranean Conference on Control & Automation (MED), pages 148-153, 2010. ISBN 978-1-4244-8091-3

G.C. Calafiore, L. Carlone, and M. Wei, “A distributed gradient method for localization of formations using relative range measurements”, in Proceedings of the 2010 IEEE Multi-Conference on Systems and Control (MSC), 2010.

G.C. Calafiore, L. Carlone, and M. Wei, “A distributed Gauss-Newton approach for range-based localization of multi agent formations”, in Proceedings of the 2010 IEEE Multi-Conference on Systems and Control (MSC), 2010.

G.C. Calafiore, L. Carlone, and M. Wei, “Distributed optimization techniques for range localization in networked systems”, in Proceedings of the 49th IEEE Conference on Decision and Control (CDC), 2010.

G.C. Calafiore, L. Carlone, and M. Wei, “Sensor Fusion for Position Estimation in Networked Systems”, In Sensor Fusion, Sciyo, 2010. ISBN 978-953-7619-X-X.

\*\*\* Next meeting \*\*\*

I am planning a joint meeting of the TC-CACSD and TC-SU during the IEEE CDC.

\*\*\* Conference activities \*\*\*

- Invited session on "LMI relaxation techniques for system identification" for 2011 IEEE-CDC/ECC -

Diego Regruto from Politecnico di Torino is organizing an invited session on the topic of LMI relaxation techniques for system identification as part of the 2011 IEEE-CDC/ECC in Orlando, Florida. This activity is being pursued in collaboration with the TC on that is chaired by Daniel E. Rivera. The invited session notice and call for participation is posted http://staff.polito.it/fabrizio.dabbene/TC-CACSD/files/LMI\_relaxation\_session\_notice\_DR.pdf

Nacim Ramdani, chair of the AG on Interval Methods, has been co-organizing an annual international workshop on interval methods since three years. The 2010 edition was held in june at Nantes, France, http://www.lina.univ-nantes.fr/swim2010/

2009 in Lausanne, CH, and 2008 in Montpellier France. It usually gathers more than 25 talks. Talks are selected on abstract. Slides are posted online. No fees no proceedings.

Xue Liu, chair of the AG on Hybrid Dynamic Systems, served as the Workshop and tutorial chair of the IEEE/ACM CPS Week 2011 http://cpsweek2011.cs.illinois.edu/ CPSWeek has 5 top venues, including HSCC, ICCPS, IPSN, RTAS, LCTECS. These venues are closley related to the research with the AG. Will hold around 15 workshops/tutorial in the CPSWEEK in 2011 at Chicago.

The AG activities will be advertised in the event.

Xue Liu, chair of the AG on Hybrid Dynamic Systems, served as guest editor for: Elsevier Computer Communications Special Issue on Convergence of Mobility, Networking, and Computing in Cyber-Physical System, and as programm committee member for more than 5 other major IEEE conferences, including Infocom 2011, RTAS 2011, ICDCS 2011 etc.