

Three of the members of the technical committee (Eduardo Sontag, M. Khammash, and Pablo Iglesias) will be holding a special "Tutorial Session" on Systems Biology in the upcoming CDC-ECC to be held in Seville, Spain in December 2005. The organizers of the conference proposed a very limited number of such tutorial sessions (5-6).

Each Tutorial Session is a two-hour slot devoted to a specific topic of high interest for the control community. A leading talk of 40 minutes providing a general overview of the area opens up the session (Eduardo Sontag). Two other talks, to be given by M. Khammash and Pablo Iglesias, will follow Sontag's talk and will offer more details. A panel discussion will follow the three presentations. The topics covered in the tutorial presentations are:

- Molecular Systems Biology and control
- Stochastic modeling and analysis of gene regulatory networks
- Direction migration: A prototypical cellular control system

Technical Committee on Computer Aided Control System Design

From: Didier Henrion, Chair
Date: May 04, 2005

In January 2005 Didier Henrion replaced Andras Varga as the chair of the TC. The previous organization of the TC has been maintained, consisting of several Action Groups (AG) responsible of disseminating technical information via dedicated webpages, organizing invited sessions, workshops, tutorials during major conferences and proposing special issues in technical journals.

Action Groups:

The main TC webpage was moved to LAAS-CNRS in Toulouse. It has been slightly modified. The new link is <http://www.laas.fr/cacsd>

The seven existing AG have been maintained and sometimes reorganized:

- Control Numerics and Software, chaired by Vasile Sima (replacing Andras Varga)
- Hybrid Dynamic Systems, chaired by Pieter Mosterman
- Interval Methods for Control, chaired by Josep Vehi
- Multidisciplinary System Simulation, chaired by Herman Mann
- Polynomial Methods for Control System Design, chaired by Zdenek Hurak (replacing Didier Henrion and Michael Sebek)
- Symbolic Methods for Control, co-chaired by Antonis Vardoulakis and Nikos Karampetakis
- Teachware for CACSD, chaired by Christian Schmid

Four new AG were started:

- Behavioral Systems, co-chaired by Ivan Markovsky and Paolo Rapisarda
- Chaos Synchronization and Control, co-chaired by Sergej Celikovskiy, Jamal Daafouz and Gilles Millerieux
- LMI and Convex Optimization, co-chaired by Yoshio Ebihara and Dimitri Peaucelle
- Probabilistic and Randomized Methods in Control, co-chaired by Fabrizio Dabbene and Giuseppe Calafiore

Webpages of these new AG are linked to the main TC webpage.

Conferences:

Several invited sessions were organized:

- 2 sessions on computational methods for CACSD at Med Conf 2005 (Karampetakis and Vardoulakis)
- Positive polynomials and LMI at IFAC 2005 (Garulli and Henrion)
- Chaos control and synchronization at IFAC 2005 (Celikovskiy)
- Polynomial methods at IFAC 2005 (Hromcik and Hurak)
- 3 sessions on dynamical systems and behaviors at IFAC 2005 (Polderman, Trentelman and Willems)
- Positive polynomials and LMI at CDC/ECC 2005 (Henrion and Chesi)
- LMI at CDC/ECC 2005 (Peaucelle and Ebihara)
- Stochastic and randomized algorithms for optimization and control at CDC/ECC 2005 (Dabbene and Piccoli)
- 3 sessions on behavioral systems at CDC/ECC 2005 (Pillai, Rapisarda and Willems)
- Interval Methods for Robust Control and Decision (Ramdami) at CDC/ECC 2005.
- Sima tried to organized an invited session on numerical methods at CDC/ECC 2005, but not enough proposals were received, and the

papers have been submitted individually.

Several TC members are involved in the organization and the IPC of the following conferences and workshops:

- Mediterranean Conf on Control and Automation (MED), Lemessos, Cyprus, June 2005
- Intl Workshop on Multidimensional nD Systems (NDS), Wuppertal, Germany, July 2005
- Intl Conf on Technology and Automation, Thessaloniki, Greece, October 2005
- joint CDC/ECC, Seville, Spain, December 2005
- IFAC Symp on Robust Control Design (ROCOND), Toulouse, France, July 2006
- MTNS Symp, Kyoto, Japan, July 2006
- IEEE CCA/CACSD/ISIC, Munich, Germany, October 2006

A joint meeting of the IEEE TC on CACSD, the IFAC TC on Control Design (chaired by Patrizio Colaneri) and the IFAC TC on Robust Control (chaired by Carsten Scherer) is planned during the IFAC World Congress in Prague in July 2005.

An OpCom meeting of the IEEE CCA/CACSD/ISIC 2006 is planned during the IFAC World Congress in Prague in July 2005, involving several TC members.

The opportunity of organizing a CACSD symposium jointly with the CCA and ISIC conferences in Singapore in 2007 is a point needing further discussion.

Journals, books, software:

Following an invited session organized during the IEEE CDC 2003, a book on positive polynomials and LMI in control was edited by Henrion and Garulli: Positive polynomials in control. Lecture Notes on Control and Information Sciences, Vol. 312, Springer Verlag, Berlin, ISBN 3-540-23948-0, January 2005.

A new book entitled Interval Analysis in Spain: developments, tools and applications (in Spanish) was edited by Josep Vehi and Jorge Bondia and should be released in a few weeks.

Following an invited session organized during the IEEE CDC 2003, a book on probabilistic methods in optimization and control is being edited by Calafiore and Dabbene. The book is in its final stages and will be available from Springer Verlag by the end of 2005.

Following a workshop on LMI in control organized in Toulouse in July 2004, see <http://www.laas.fr/~henrion/lmi04>, a special issue of the European Journal of Control will be edited by Arzelier, Peaucelle, Henrion and Scherer, under the guidance of Editor-in-chief Sergio Bittanti. Submitted papers are currently under review.

A special issue on CACSD of the International Journal of Control is being prepared by Vardulakis and Karampetakis. Editor-in-chief Eric Rogers gave his approval, with deadline for paper submission July 1, 2005.

New software developments:

- COMPLIB 1.0, released in 2004 by Friedemann Leibfritz, is a collection of benchmark state-space linear systems for static-output feedback, H2 or Hinf control, see <http://www.mathematik.uni-trier.de/~leibfritz>
- PENBMI 2.0, released in 2005 by Michal Kocvara and Michael Stingl, the first publicly available code for solving (locally) non-convex bilinear matrix inequality (BMI) problems, see <http://www.penopt.com>
- YALMIP 3.0, released in 2004 by Johan Lofberg, a new version of the Matlab toolbox for rapid prototyping of optimization problems, including an interface to PENBMI 2.0, see <http://control.ee.ethz.ch/~joloef/yalmip.msql>
- SLICOT 5.0, released in 2005, library for control theory computations. Available in few weeks on a new server in Germany. The new release includes improvements of about 20 routines (more BLAS 3 oriented), bug fixes, additional scripts for generating and testing the SLICOT-based Matlab MEX-files, more detailed installation and usage information, better structuring of the collection of files, and a new Web site organization and presentation. Part of the SLICOT software has been incorporated in the Matlab 7 Control System Toolbox (Release 14).

During past workshops (Semidefinite programming and robust optimization, Institute of Mathematics and its Applications, University of Minnesota, Minneapolis, USA, March 2003 - Large scalar nonlinear and semidefinite programming, University of Waterloo, Canada, May 2004) researchers of the mathematical programming community expressed interest in benchmark convex optimization problems coming from control engineering. Contributions are welcome.