The Technical Committee on System Identification and Adaptive Control (TCSIAC) is pleased to report on activities undertaken during the past six months (December 2011 – May 2012).

TC meetings and membership update

1. The committee met on December 12, 2011 during the 50th IEEE-CDC in Orlando, with 24 members in attendance. This is the largest attendance we have recorded at one of our meetings since the inception of the TC in 2006. Our next meeting is scheduled for Wednesday, June 27 from 2:30 – 3:30 p.m. as part of the upcoming 2012 American Control Conference (room to be announced).

2. Current TC membership stands at 82. We continue to actively encourage new members, and make all of our meetings open to promote recruitment and participation.

On-Going Activities, Activities in Progress

1. Edited volume on LPV system identification, World Scientific Publishing.

An edited volume on LPV system identification entitled “Linear Parameter-Varying System Identification: New Developments and Trends” was published in December 2011 World Scientific Publishing. The editorial team was comprised of Paulo Lopes dos Santos, Carlo Novara, Teresa Paula Perdicoúlis, José Ramos and Daniel Rivera. Twelve of the thirteen chapters in the volume include at least one author who is a member of the TC; the foreword clearly states that the TC-SIAC served as a major driving force for the publication. Additional information on the volume can be found on:

http://www.worldscibooks.com/mathematics/8186.html


On-going efforts in establishing a venue for benchmark papers have led to a Special Issue of Control Engineering Practice focused on a Weiner-Hammerstein identification benchmark problem first presented at the SYSID 2009 meeting. The second stage of review has been recently completed for 14 submissions were received for this issue; nine papers are expected to form part of the final issue. The expected publication date is not
yet decided but may be later this year or early 2013.

3. *Special Issue of IEEE-TAC on relaxation methods in identification and estimation; joint activity with TC-CACSD (chaired by Fabrizio Dabbene).*

The TC-SIAC, in collaboration with the TC on Computational Aspects of Control System Design (TC-CACSD) submitted a proposal for a Special Issue of the *IEEE Transactions on Automatic Control* on “Relaxation Methods in Identification and Estimation Problems” which was approved by the TAC Editorial Board in its meeting during the 2011 IEEE-CDC in Orlando. Proposers are Diego Regruto and Daniel Rivera (TC-SIAC), along with Fabrizio Dabbene (TC-CACSD). A description of the Special Issue can be found in:

http://nd.edu/~ieeetac/special.html - 14

The TAC PaperPlaza site is currently accepting submissions for this issue, with a final deadline of October 1, 2012.

4. *TC-sponsored invited sessions at the 50th IEEE-CDC (Orlando), the 2012 American Control Conference (Montreal), the 2012 IFAC SYSID symposium (Brussels) – accepted.*

The TC was involved in organizing the following invited sessions for the 50th IEEE CDC/ECC in Orlando, FL:

**MoA05:** Unveiling the Unknown Structure of a Network System (D. Materassi and L. Giarrè, organizers).

**TuA18:** Convex relaxation techniques in system identification, (D. Regruto and D. Rivera, organizers, jointly with Fabrizio Dabbene, chair of the IEEE-CSS TC on CACSD).

Various invited sessions with TC sponsorship were approved for the 2012 American Control Conference in Montreal. The session **ThC10:** Modern Control Approaches in Human Behavior and Medicine” was co-organized by Daniel Rivera and Daniel Davison, with half of the papers focused on system identification issues. TC-SIAC member Roland Tóth is a co-organizer for **WeA21:** Linear Parameter-Varying Control.

TC-SIAC members were very active in organizing invited sessions for the 2012 IFAC Symposium on System Identification (SYSID 2012) to be held in Brussels, Belgium in July. This includes a four-session track on block-oriented system identification (**WeA01, WeB01, WeC01, and ThC01**) organized by Er-Wei Bai and Fouad Giri; these sessions examine statistical methods, optimization approaches, and complex nonlinearities in block-oriented systems. Thomas Schön, Adrian Wills, and Bhushan Gopaluni organized two sessions on Sequential Monte Carlo Methods (**WeC02 and ThC02**), with Alessandro Chiuso having organized a session on Sparse Methods (**ThB03**). Two sessions on system identification in healthcare and medicine (**WeC05 and ThA05**) were organized by Daniel Rivera and José Ramos, with Roland Tóth co-organizing a session on Parameter Varying Systems (**FrB06**). M. Sznaier and D. Rivera will deliver plenary talks at the conference; R. Tóth, P. Van den Hof, and L. Ljung will participate in a closing plenary session on
changes and challenges in system identification.

5. **TC-sponsored invited sessions at the 51st IEEE-CDC (Maui), the 2013 American Control Conference (Montreal), the 8th IFAC Symposium on Biological and Medical Systems (BMS 12; Budapest, Hungary).**

Roland Tóth and Diego Regruto have proposed an invited session for the 2012 IEEE-CDC in Maui on convex relaxation approaches to LPV modeling, identification, and control. Clara Ionescu and Guy Dumont organized a special session for BMS12 entitled, “Model Formulation, Decision Support, and Control of Depth of Anesthesia: Towards a Multivariable Paradigm.” João Lemos and Daniel Rivera are organizing an invited session for the 2013 American Control Conference on Robust Adaptive and Nonlinear Control for Healthcare.

6. **System identification and adaptive control educational depository.** There has been an ongoing discussion within the TC-SIAC for establishing a new generation of data and software depositories that could be used as benchmarks for evaluating system identification techniques. We are also interested in enhancing educational efforts in the fields of system identification and adaptive control through novel technology, such as interactive software tools. An initial version of the site is now up and running:

   [http://cse1.asu.edu/ieeetc/educational](http://cse1.asu.edu/ieeetc/educational)

We continue to make calls among our members for materials (e.g., syllabi, notes, software) in support of this effort.

**New Initiatives and Activities**

1. The TC is spearheading an effort to establish an interest group in control engineering problems in medicine and health care. This activity is intended to appeal not only to members of our TC, but also to the CSS membership at large. The VP for Technical Activities provided seed funds for meetings with interested individuals during the San Francisco ACC and Orlando CDC-ECC conferences. Twenty individuals attended the meeting held during the IEEE-CDC in Orlando, while many others have expressed an interest in being part of this effort. Following some discussions with the CSS VP for Technical Activities and the CSS ExCom, we are pursuing the possibility of establishing this interest group as a stand-alone technical committee within IEEE-CSS. A website describing this effort can be found in [http://cse1.asu.edu/ieeetc/healthtc](http://cse1.asu.edu/ieeetc/healthtc).

This concludes our first bi-annual report for the 2012 calendar year. The TCSIAC website ([http://cse1.asu.edu/ieeete](http://cse1.asu.edu/ieeete)) represents a resource with up-to-date information on TC activities, educational materials, and membership.