

CHARTER RENEWAL APPLICATION

This CHARTER RENEWAL APPLICATION applies to the SIAM Activity Group on Control and Systems Theory. The SIAG/CST was originally formed under the aegis of SIAM on July 20, 1986 by the SIAM Council and July 25, 1986 by the SIAM Board of Trustees. Its initial operating period began January 1, 1987 and ended December 31, 1989. Its charter has been renewed by the council and board nine times thereafter. This SIAG had 832 members as of December 31, 2012; of these, 464 were students.

According to its Rules of Procedure, the objective of the SIAG is to foster activity and interaction between mathematicians, engineers and other scientists interested in control and systems theory. The SIAG plans to encourage further development of theory and methods for the estimation and control of systems.

Within the framework of SIAM, the SIAG will conduct activities that implement its purposes.

Its purposed functions are to organize activities, including conferences, sessions at SIAM meetings, sessions at meetings of other organizations cooperating with SIAM, and publications, to (1) promote interaction between mathematicians, engineers and other scientists interested in control and systems theory, (2) keep SIAM membership up to date on developments in this area, (3) facilitate the development of control and system theory and (4) encourage its application.

The activity group awards two prizes: (1) the SIAM Activity Group on Control and Systems Theory (SIAG/CST) Prize, established in 1997, is awarded every two years to a junior researcher for outstanding research contributions, as determined by the prize committee, to mathematical control or systems theory and (2) the SIAG/CST Best SICON Paper Prize established in 2007. The prize is awarded every two years to the author(s) of the two most outstanding papers, as determined by the prize committee, published in SICON in the two calendar years before the year of the award.

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The SIAG has complemented SIAM's activities and supported its proposed functions. The answers to the questions below indicate how this was accomplished and what the officers propose as the future directions for the SIAG.

1. How is the field covered by the activity group doing? Is it growing, is the focus shifting? What have been the significant advances over the last [two/three] years?

Although this is a mature field, there remain areas of intense development. The development is fueled both by internal mathematical progress and by exogenous requirements imposed by technological developments in computing, communications and other areas. Internally, there is continuing progress in areas such as stochastic control (e.g., fractional Brownian motion models), game theory (e.g., mean field games), constrained control (e.g., model-predictive control methods and linear matrix inequalities), nonlinear systems (e.g., Lyapunov-based and max-plus methods), etc. Equally importantly, exogenous requirements from improved communication/computing and new application areas include: cooperative and decentralized control paradigms for interconnected systems as well as quantum and biological systems whose dynamics are far removed from the classical systems around which control theory was originally developed.

2. How is the activity group doing? Is it remaining vibrant? Is the size of the SIAG stable or increasing? How is the SIAG keeping up with the changes in the field? How are the broader interests of SIAM reflected in the activities of the SIAG?

The activity group remains vibrant. Evidence for this is that the chief conference associated with the SIAG/CST is continuing its growth, with the upcoming CT13 having the largest attendance in more than a decade.

The SIAG is, almost by definition, keeping up with the field. Notably, SICON remains one of the top three journals in the area.

The field of control theory continues to require fundamental advances in applied mathematics, and therefore reflects the broader interests of SIAM.

3. Please list conferences/workshops the activity group has sponsored or co-sponsored over the past two years, and give a brief (one sentence or phrase) indication of the success or problems with each.

The activity group sponsors a biennial meeting. See <http://www.siam.org/meetings/archives.php#CT> for the list of past conferences. The SIAM Conference on Control Theory and its Applications met jointly with the SIAM Annual Meeting in Denver in 2009. The next SIAM Conference on Control Theory and its Applications was held on July 25-27, 2011 in Baltimore, MD with 205 attendees. The 2007 meeting outside San Francisco was too poorly attended, which reflected badly on the SIAG. This has been steadily improving. It has been difficult to obtain attendance numbers when CT## is co-located with AN##. However, CT11 was larger than CT07, and CT13 will be larger than CT09.

4. Please indicate the number of minisymposia directly organized by the activity group at the last [two/three] SIAM Annual Meetings. When did the SIAG last organize a track of minisymposia at an annual meeting?

The SIAG has a biennial conference. In recent years, this is co-located with the SIAM Annual meeting every-other time. The two meetings work well together. Given this co-location, the SIAG does not typically organize minisymposia at the Annual meetings. SIAG/CST does typically organize minisymposia at the annual IEEE CDC (Conf. on Decision and Control) and the annual ACC (American Control Conf.).

5. Please indicate other activities sponsored by the activity group, to include newsletters, prizes and web sites. Have each of these been active and successful?

The SIAG does not maintain a newsletter, but it does sponsor two prizes: the SIAG/Control and Systems Theory Prize and the Best SICON Paper Prize. The SIAG needs to continue to work toward improved advertisement of the SIAG/Control and Systems Theory Prize (given to younger researchers), as in 2011 there was only one nomination, and in 2013 there were only two.

6. What activities are planned and proposed for the next period of the charter? Please describe scheduled and suggested future activities in detail.

SIAG/CST is planning to hold CT15 in Europe. This will be a significant milestone for the SIAG, as it reflects our plan to more assiduously attempt to grow the SIAG internationally.

7. How can SIAM help the activity group achieve its goals?

The comments from the previous Charter Renewal Document are appropriate here. Some progress has been made, but we should continue our efforts on the previous tasks. From the previous 2011 Charter Renewal Document:

- We believe that SIAM can help us in the following ways. First, as mentioned earlier, we need to have our biennial conference announced earlier and publicized better. All of the other conferences in our area, CDC, ACC, MTNS, etc. announce the dates and venue at least two years in advance of the conference. As a result, our meeting announcement comes as a belated surprise to all but the most active members of our SIAG.

- Second, all of the other conferences in our area are held in nicer hotels in more interesting venues. SIAM could help us considerably by booking our meeting in better (more expensive) hotels in more interesting places.

With regard to the second item, the heavy engineering component within the control field implies that the other major controls conferences are held in much nicer locations, and CT## suffers because of this. The co-location with AN11 prevented us from correcting the problem in 2013. The European location of 2015 makes the issue somewhat moot in 2015, but we should keep an eye on this for 2017 and beyond.

8. How can the activity group help SIAM in its general role of promoting applied mathematics and computational science?

SIAG/CST continues to shine a light on the importance of mathematics within the field of control. Although control is already a highly mathematical endeavor, it is important to both the future of the field itself, and to the continued growth of applied mathematics, to maintain the high profile of fundamental mathematics within the field. The SIAG/CST does this both through SICON and CT##.

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a two-year operating period beginning January 1, 2014.

Signed

William McEneaney

Date needed here
