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 eight times thereafter. This SIAG had 822 members as of December 31, 2010; of these, 470 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.

*   *   *

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?

The field of control and system theory is continuing to deepen and broaden; mathematics extending from algebraic structures and differential geometry to partial differential equations, stochastic analysis and numerical analysis constitute the fundamental methods which are in use today. These mathematical subjects are being used to advance established topics such as viscosity solutions of non-smooth optimal control problems, fractional Brownian motion control problems and limited channel capacity feedback control, and equally they are being employed to formulate and study new areas such as quantum control systems, systems biology and mean field stochastic control. Simultaneously, application areas have expanded enormously over the last three to five years so that they now include a vast range of topics extending from renewable energy systems and the control of networked systems to surgeon assistive systems in medicine.

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 is doing well. As of December 31, 2010, our membership had increased to 822 from 762 in 2009. This continued a pattern of continual growth since a low of 352 in 2002. Most of the growth has been student members, from 52 in 2002 to 470 in 2010.

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 is scheduled for July 25-27, 2011 in Baltimore.

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 not organized mini symposia at the last three SIAM annual meetings. There are two reasons for this. The first is that the annual meetings in 2008 and 2010 were joint with the SIAM Conference on Control Theory and its Applications—our biennial meeting. The second is that we have organized two mini symposia at the American Control Conference in each of the last three years. This was a prerequisite for SIAM to become a member of the American Automatic Control Council (AACC). As of this year, SIAM is a member of the AACC. This was one of our goals for the past several years.

We also organize several mini symposia at the IEEE Conference on Decision and Control (CDC) every year. The mini symposia at the CDC and ACC are important to our functions 3 and 4 in the preamble

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?

We have not sponsored a newsletter or a web site. We do sponsor two prizes, as described in the preamble.

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

We have begun planning for CT-13, the 13th in the series of SIAM Conferences on Control Theory and its Applications. We feel it is important to advance the schedule for our conference. One objective is to have the venue chosen early enough that it can be announced early in the summer of 2012. We believe that attendance would be increased substantially by, among other things, having an announcement of our conference at the MTNS meeting in 2012.

We are planning to continue organizing two or more invited sessions at the ACC and CDC every year.

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

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. There is considerable interest in having CT-13 outside the US, for example.

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

Our SIAG is important to SIAM's efforts to promote applied mathematics because control is an area that integrates several areas of mathematics with technology. For example, controls experts use optimization, linear algebra, dynamical systems, analysis of partial differential equations, and discrete mathematics to solve practical problems. Some of our members play an important role in bringing these areas of applied mathematics into industrial use.

One aspect of this is that we have a fairly large number of members who are employed in engineering departments or who are trained as engineers.

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a two-year operating period beginning January 1, 2012.

Signed
William Levine
[June 20, 2011]