

CHARTER RENEWAL APPLICATION

This CHARTER RENEWAL APPLICATION applies to the SIAM Activity Group on Control and Systems Theory. The SIAM Activity Group (or SIAG) to which this renewal applies 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 with its initial operating period beginning January 1, 1987 and ending December 31, 1989. Its charter has been renewed by the council and board five times thereafter. This SIAG has 387 members as of October 31, 2003.

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. Its proposed functions were to organize activities, including conferences, sessions at SIAM meetings, sessions at meetings of other organizations cooperating with SIAM, and publications, in order 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 system theory and (4) encourage its application.

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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 three years?

Mathematical control theory remains a vital and important field, as witnessed by the health of journals such as the SIAM Journal on Control and Optimization and the several large meetings in this field that include the Control and Decision Conference (CDC) of the IEEE and the conference of this SIAG. Recent focuses in the field include a heavier emphasis on control of distributed parameter systems (PDEs) and control of stochastic systems, and optimization of systems governed by PDEs (as in optimal shape design, for example). The attached program from the SIAM Conference on Control and its Applications in 2001 reflects these themes.

2. How is the activity group doing? Is it remaining vibrant? Is it keeping up with the changes in the field? What is the role of mathematics, industry, and interdisciplinary activity?

Membership in this SIAG has held steady over recent years and currently stands at 387 members. The field is inherently interdisciplinary with strong ties to engineering. It touches on many parts of mathematics as well, such as dynamical systems, PDEs, scientific computing, optimization, and mathematical finance (especially stochastic control), to name only a few. The topic has natural ties to the aerospace industry.

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

In an effort to continue to foster activities and interaction between members of this group and the control and systems theory community in general, this SIAG organized the Fifth SIAM Conference on Control and Systems Theory held July 11-14, 2001 in San Diego in conjunction with the SIAM Annual Meeting.

We are already planning to hold the Sixth SIAM Conference on Control and Systems Theory in conjunction with the SIAM Annual Meeting in New Orleans in July 2005. The conference has been scheduled for Sunday, July 10, through Wednesday, July 13, 2005, to overlap with the first half of AN05. The conference was moved from its usual 3 year rotation in cooperation with the organizers of the MTNS 2004 meeting scheduled the week after SIAM AN04 to facilitate attendance at both the MTNS and the

SIAG Conference (there is significant overlap of individuals in the control community who attend both on a regular basis).

Another major activity of SIAG members is in conjunction with the annual Conference on Decision and Control sponsored primarily by the IEEE Control Systems Society. SIAM is listed formally as a collaborator in this meeting. Its contribution is to provide a member of the program committee (from the SIAG membership) who, among other duties, helps select papers that have been accepted for SIAM J. on Control but that have not yet appeared. These authors are invited to have their paper presented at the CDC and a shortened version appears in the refereed proceeding of the CDC. Both the presentations and papers are designated as SIAM contributions to the CDC.

4. Please indicate the number of minisymposia directly organized by the activity group at the last two annual meetings.

Members of the SIAG organize several invited minisymposia at the SIAM Annual Meeting each year. Most recently, sessions were accepted for both AN02 (Philadelphia) and AN03 (Montreal). Sessions are being organized for AN04 (Portland).

It should be noted that in 2001, the SIAG ran its conference in parallel with the SIAM Annual Meeting in San Diego, and we intend to do the same in 2005 in New Orleans. This mechanism provides a strong overlap between the SIAG and SIAM membership at large.

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 continues to publish the SIAG newsletter to keep the members informed of activities in the control and systems theory community, both within SIAM and in other control societies. Members of the SIAG have provided leadership on the Editorial Board of the SIAM book series on control ("Advances in Design and Control") since its inception.

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

SIAG members have provided major leadership on the Editorial Board of the SIAM J. on Control and Optimization (the current Vice Chair of the SIAG is the current Editor-in-Chief of the Journal and the current Chair of the SIAG served for 2 terms as the Editor-in-Chief of the Journal). The Journal continues for some time to maintain its reputation as the leading journal on the mathematical theory of control.

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

The group continues to be an active and successful SIAG. The book series, journal, and SIAG (with its triennial conference) all complement each other to help the SIAG promote its mission to advance this subarea of mathematics and its applications.

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

We feel the SIAG accomplishes this through the various activities that go well beyond a conference. Assisting the SIAG to cooperate with the IEEE CDC is one important example.

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a three-year operating period beginning January 1, 2005.

H. Thomas Banks
SIAG/CST Chair
November 21, 2003



Invited Presentations

Wednesday, July 11

8:30 AM - 9:15 AM

IP1 Cooperative Control: Case Studies
Raffaello D'Andrea, Cornell University

9:15 AM - 10:00 AM

IP2 Solving Optimal Control Problems-A Practical Perspective
John T. Betts, The Boeing Company

2:00 PM - 2:45 PM

JP1 Dynamical Systems and Control in Celestial Mechanics and Space Mission Design
Jerrold E. Marsden, California Institute of Technology

Thursday, July 12

8:30 AM - 9:15 AM

IP3 Applied Optimal Shape Design
Olivier Pironneau, Universite Paris VI, France

9:15 AM - 10:00 AM

IP4 Quantum Measurement and Feedback
Hideo Mabuchi, California Institute of Technology, USA

2:00 PM - 2:45 PM

JP2 Pervasive Wireless Networks: Some System Theoretic Challenges
P. R. Kumar, University of Illinois, Urbana-Champaign

Friday, July 13

8:30 AM - 9:15 AM

IP5 Recent Progress in Control and Stabilization of Coupled PDE's Systems Arising in "Smart" Material's Technology
Irena Lasiecka, University of Virginia.

9:15 AM - 10:00 AM

IP6 Approximations in Constrained Optimal Control
Assen Dontchev, Mathematical Reviews (AMS) and the University of Michigan, Ann Arbor

5:25 PM - 6:10 PM

IP7 Optimal Control of Partial Differential Equations. Numerical Analysis and Applications
Fredi Troltzsch, Technische Universitaet Berlin, Germany

Saturday, July 14

8:30 AM - 9:15 AM

IP8 Matrix Inequalities and Analyzing Them Automatically

J W. Helton, University of California, San Diego

9:15 AM - 10:00 AM

IP9 Model Development and Control Design for High Performance Nonlinear Smart Material Systems

Ralph C. Smith, North Carolina State University

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