

Charter Renewal Application for the SIAM Activity Group on Optimization

This CHARTER RENEWAL APPLICATION applies to the SIAM Activity Group on Optimization. The SIAG/OPT was originally formed under the aegis of SIAM on October 27, 1985 by the SIAM Board of Trustees and electronically by the SIAM Council in January 2000. Its initial operating period began January 1, 1986 and ending December 31, 1988. Its charter has been renewed by the Council and Board 8 (eight) times thereafter. This SIAG has 1,382 members, including 771 student members, as of December 31, 2011.

According to its Rules of Procedure, the objective(s) of the SIAG are to provide an environment for interaction between applied mathematicians, computer scientists, engineers, scientists, and others interested in optimization. The SIAG aims to foster the development of methods, software, and theory for optimization, and to foster the use of optimization techniques in scientific and industrial applications. Within the framework of SIAM, the SIAG will conduct activities that implement its purposes.

Its purposed functions were:

The SIAG on OPT will organize activities in Optimization. The SIAG is expected to:

1. Organize minisymposia at the SIAM Annual Meeting in years where there is no SIAG conference.
2. Organize a track of at least six minisymposia at the SIAM Annual Meeting at least once every five years. The VP for Programs and the VP at Large will coordinate the scheduling with the SIAG Chairs.

Other activities can include:

3. Organize a triennial SIAM Conference on Optimization. The SIAG will consider dovetailing specialized workshops and conferences with the SIAM Annual Meeting or other SIAG conferences. The co-Chairs of the Conference Organizing Committee shall be the Program Director and the Chair of the SIAG or their designees. The organizing committee must be approved by the VP for Programs at least 16 months before the conference.
4. With the approval of the SIAM Program Committee, the SIAG may organize special sessions at SIAM meetings, and conduct special one- or two-day meetings immediately before or after a regular SIAM meeting. Other SIAG meetings may be organized only with the approval of the SIAM President and Vice President for Programs.
5. Awarding of the triennial SIAG/Optimization prize, established in 1992.
6. Maintain a SIAG wiki site http://wiki.siam.org/siag-op/index.php/Main_Page or produce a newsletter for SIAG members.

The SIAG will organize these and other activities in order to (1) promote interaction between applied mathematicians, computer scientists, engineers, scientists, and others interested in optimization; (2) keep SIAM membership up to date on developments in optimization; and (3) facilitate development and application of optimization methods, software, and theory.

SIAG meetings, workshops, and conferences may be organized only with the approval of the SIAM President and the SIAM Vice President for Programs.

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. List all current officers of the activity group (including advisory board, if relevant).

- **Chair:** **Michael Todd**
- **Vice Chair:** **Mihai Anitescu**
- **Program Director:** **Miguel Anjos**
- **Secretary/Treasurer:** **Marina Epelman**
- **Newsletter Editors:** **Sven Leyffer**
Franz Rendl

2. 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?

Optimization remains a very vibrant field, with applications throughout science and engineering as well as in business, logistics, and health care. In compressed sensing, machine learning, and high-dimensional statistics, there is a mantra of the “unreasonable success” of convex optimization. The three papers nominated for best paper awards from SIOPT include one on an application to data mining, one on a distributed algorithm for network optimization in the presence of noise, and one on derivative-free optimization using radial basis functions. The most recent SIAM Optimization Prize went to a paper applying semidefinite programming to obtaining better bounds for kissing numbers and designing spherical codes. And there continues to be much interest in optimization under uncertainty, either through stochastic programming or robust optimization. These illustrations point out the breadth and activity in optimization.

3. 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 number of nonstudent members has remained stable over the last few years, after earlier slow growth. The number of student members continues its rapid growth, hopefully indicating healthy numbers in the future. The SIAG/OPT was the second largest in SIAM as of December 2010; it currently has 1382 members. This includes 899 US members, and 483 foreign; and 771 student versus 611 nonstudent members. Optimization is closely related to several other areas in SIAM, like computational science and engineering, control and systems theory, data mining and analytics, and imaging science. There are also potential links with the new SIAG on uncertainty quantification, particularly in calibration.

4. 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. The SIAG OPT organizes the triennial conference on Optimization. This list of conferences may be found at: <http://www.siam.org/meetings/archives.php#op>.

The SIAM Conference on Optimization which was held in Germany in 2011 had 620 registered attendees, the most yet. It was enthusiastically received by the attendees, and featured varied invited presentations from academics and researchers from the Harvard Medical School and Massachusetts

General Hospital, from the Electric Energy Research Center of Brazil, and from the IBM T.J. Watson Research Center. Over the last few conferences, about half of the plenary speakers have been from the US, and half from a variety of other countries.

5. Please indicate the number of minisymposia directly organized by the activity group at the last two SIAM annual meetings. When did the SIAG last organize a track at an annual meeting or meet jointly with the SIAM Annual Meeting?

The SIAG organized a track at AN10, with minisymposia on first-derivative methods for convex optimization, on mixed-integer programming, and on matrix rank minimization.

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

In recent years, the SIAG has generated two newsletters each year, with a topical lead article: recent examples are environmental optimization, nonlinear integer programming, and nonsmooth optimization, and the newsletter editors seek out hot topics to present to the group. The activity group sponsors the SIAM Prize in Optimization, which is judged to be very prestigious. There is also a (not very active) SIAG wiki, and while not directly related, the SIAM/MOS book series on optimization has published a wide range of high-quality books.

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

This year will be fairly quiet, as there is an International Symposium on Mathematical Programming to be held in Berlin in August, organized by the Mathematical Optimization Society. The next big event will be the SIAM Conference in Optimization, scheduled for late May 2014 in San Diego. We hope to organize a track with several minisymposia for the SIAM Annual Meeting in 2013.

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

SIAM provides excellent logistical support for the activity group and handles the non-programmatic elements of the optimization conferences. It also hosts the activity group website and wiki.

9. How can the activity group help SIAM in its general role of promoting optimization?

The SIAG promotes SIAM membership at the business meeting at the SIAM Optimization Conference and through its website and wiki. We encourage publication in SIOPT, which is one of the two leading journals in optimization. We will also endeavor to organize minisymposia at the SIAM annual meetings. Several SIAG members have supported SIAM (and the role of optimization within SIAM) by serving as officers, including Tamara Kolda, Sven Leyffer, Michael Overton, Margaret Wright, and Stephen Wright. Finally, besides the SIAG prize, SIAG/OPT members are active in the solicitation of nominations and the selection for the SIAM/Mathematical Optimization prizes, the George B. Dantzig Prize and the Lagrange Prize in Continuous Optimization.

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a three year operating period beginning January 1, 1013.

Michael Todd
SIAG/OPT Chair
May 30, 2012