SIAM Activity Group Discrete Mathematics
Charter Renewal Application

This CHARTER RENEWAL APPLICATION applies to the SIAM Activity Group on Discrete Mathematics. The SIAG/DM was originally formed under the aegis of SIAM on July 19, 1984 by the SIAM Council and July 20, 1984 by the SIAM Board of Trustees. Its initial operating period began January 1, 1985 and ended December 31, 1987. Its charter has been renewed by the council and board eleven times thereafter.

This SIAG had 631 members and, of those, 334 were students as of December 31, 2017.

According to its Rules of Procedure:

It is the purpose of the SIAM Activity Group on Discrete Mathematics to foster research in discrete mathematics and the development of its applications, and to bring together and stimulate interaction between the various and diverse communities of mathematical scientists such as those who specialize in graph theory, combinatorics, computer science, communications, and operations research. Within the framework of SIAM, the SIAG will conduct activities that implement its purposes.

The SIAG on Discrete Mathematics will organize activities in discrete mathematics. The SIAG is expected to:

1) Organize minisymposia at the SIAM Annual Meeting on years when there is no SIAG conference.

2) Organize a track of at least six minisymposia at the SIAM Annual Meeting at least once every seven (N.B.: previously, when there were fewer SIAGs, this number was 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 biennial SIAM Conference on discrete mathematics. The SIAG will consider dovetailing specialized workshops and conferences with the SIAM Annual meeting or other SIAG conferences. The chair of the conference organizing committee shall be either the program director or the chairperson of the SIAG or their designee. The organizing committee must be approved by the VP for Programs at least 18 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.

SIAG meetings, workshops, and conferences may be organized only with the approval of the SIAM president and the SIAM vice president for programs.

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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 years?

The area of Discrete Mathematics is strong and gaining in its impact on other fields of mathematics, theoretical computer science, bioinformatics, theoretical physics, social sciences and others. It is also used in industrial mathematics through software development. Powerful new methods are being developed and new results find applications within the mentioned areas.

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 predominantly academic in membership and in research goals, but this is quite natural given that new theories are needed. We have seen development of probabilistic methods and other tools for dealing with large graphs. They are used to study specific large graphs, such as the internet, various social networks, epidemiology, etc. The activity is extremely vibrant and implementation of the methods in applications are still to be expected.

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 main conferences/workshops the activity group has sponsored or co-sponsored over the past two years are:
-   SIAM DM 2016 (Atlanta, June 2016), about 340 attendees.
-   SIAM DM 2018 (Denver, June 2018), about 330 participants.

- SODA 2017 (Barcelona, Spain, January 2017), co-located with two other SIAM sponsored conferences [Algorithm Engineering and Experiments (ALENEX17)](#) and [Analytic Algorithmics and Combinatorics (ANALCO17)](#).
- SODA 2018 (New Orleans, January 2018), co-located with two other SIAM sponsored conferences ALENEX18 and ANALCO18.
- Track with 12 Minisymposia at SIAM/AN17 in Pittsburgh.

4.   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 of minisymposia at an annual meeting?

SIAG/DM organized a track of 12 Minisymposia.SIAM/AN17 in Pittsburgh, PA, under the leadership of former SIAG/DM vice-chair Lenore Cowen.

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?

SIAG/DM awards the Dénes König Prize biannually at the SIAM DM meetings.

SIAG/DM keeps an active mailing list informing its members about relevant activities, and has an official SIAM web page, which has been upgraded recently. The SIAG activity on the web page has not been very active in the past years.

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

In the next charter period, SIAG/DM plans to continue organizing the biennial SIAM Conference on Discrete Mathematics, co-organizing the annual ACM/SIAM Symposium on Discrete Algorithms (SODA) meeting and supporting publication of high-quality discrete mathematics through the SIAM Journal in Discrete Mathematics (SIDMA). We also plan to update the SIAG's web page to be more current and informative.

The SIAG is committed to supporting a continuing home for discrete mathematics via well-regarded established activities/venues and partnering as appropriate to strengthen the infrastructure for broader applied discrete mathematics / combinatorial algorithms community within SIAM.

Based on the recommendation of the prior officers and SIAM leadership, the SIAG proposes to undertake a survey of DM and/or SODA attendees to better understand the existing community's relationship to SIAM. The survey would be administered by SIAM, using questions developed by the current officers of the SIAG.

In appointing co-chairs and selecting plenaries/minisymposia for the next DM meeting, SIAG/DM will strive to ensure representation from affiliated communities - the DM16 meeting in Atlanta and the recent DM18 meeting in Denver offer excellent exemplars of

prior success with this strategy, with strong representation from theoretical computer science. Discrete computational biology is another promising group for building such diversity. Further, we will engage in discussions with the editorial board of SIDMA to ensure that the current group of editors reflects (both in fact and in perception) the diversity of applied and pure discrete mathematics welcome and encouraged for publication in that venue.

Further, based on recent discussions within SIAM, we anticipate efforts to charter a new SIAG in the area of applied combinatorial algorithms that would offer a nice complement to the activities and current membership of SIAG/DM. If SIAM chooses to support the charter of such a new activity group, SIAG/DM is more than happy to co-locate its future biannual Discrete Math meetings with those of the new SIAG, as this would be mutually beneficial and increase the attractiveness of these events to graph theorists and other discrete mathematicians working in industry.

Additionally, the SIAG aims to reinvigorate their relationship with the theoretical computer science community, starting with stronger engagement at SODA; the officers plan to draft a new set of guidelines and objectives for SIAG/DM appointments to that conference's Steering Committee.

SIAG/DM is willing to help in attracting additional SIAM membership from the applied discrete mathematics and discrete algorithms communities. We specifically plan to encourage the utilization of SIAM/SIAG member discounts at SODA, as well as ALENEX and ANALCO, two conferences co-located with SODA that target experimental algorithms and analytic combinatorics and naturally attract many applied discrete mathematicians. We further hope to strengthen contacts with discrete mathematicians within Europe and Asia, with strong initial interest in extending our activities to East Asia within the framework of SIAM.

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

The SIAM Dénes König Prize had past support from a one-time donation by Google. The amount given by Google was symbolic ($5K) and has served us for the past six prizes. We hope that SIAM will help us obtaining new support from IT industry sponsorship that would give use long term security for the Prize.

Several participants have expressed their hope that SIAM could offer an option to pay for SIAM membership through an optional (slightly increased) conference registration fee since many academic institutions do not allow direct support for society memberships.

There was a recent interest of discrete mathematics community in China to become involved in SIAM activities. In order to tighten the contacts and make them more formal, help from SIAM would be needed.

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

The main activity of the SIAG/DM is organizing of the bi-annual SIAM DM conferences and annual conference series of SODA. Both of these events are our flagship events. Many people think that SIAM DM is the highest quality conference series for graph theory and combinatorics in North America. We believe that this by itself is our great accomplishment and mission that promotes our activity. Our recent SIAM DM conferences had the program committee with two co-chairs, one from academia and one with applied background. We plan to keep this model also in the future.

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

The DM SIAG is crucial for providing a bridge to the theoretical computer science and algorithms communities. By promoting new achievements within discrete mathematics, we provide means of staying in contact with recent developments in graph theory and combinatorics that can be inspiring and crucial for work in applied combinatorics, theoretical computer science and discrete branches of industrial mathematics.

Signed by:

Bojan Mohar
SIAG/DM Chair

Date:
July 3, 2018