Guidelines for the Renewal or Termination of SIAGS

When a SIAG is up for renewal, the Charter Renewal Application asks SIAG officers to provide detailed information about the SIAG's activities during its present term as well as specific plans for future activities. A SIAG that has not been active during its present term will not be automatically renewed. Activities may be of various natures according to the SIAG's interests; examples include organization of conferences, a regular newsletter, SIAG participation in SIAM annual meetings, an up-to-date Web portal, etc. Membership is also a clear indication of the health of a SIAG. If a SIAG's membership is dropping, this may indicate that renewal is not appropriate.

SIAG leaders are expected to respond to questions from the SIAM office in a timely way, normally by email, and to organize regular elections following the SIAG Rules of Procedure.

SIAG renewals are reviewed by both the SIAM Council and Board; the renewals take place effective the beginning of a calendar year. Requests for renewal are due no later than June 1 of the previous year so that they may be considered by the Council and Board at their summer meetings. If the Council or Board decides that renewal of the SIAG may not be appropriate, the SIAG officers will be notified during the summer so that they have the opportunity to provide more information to the SIAM office during the fall. This information will be due no later than November 1. The Council will then be polled by email, and if the Council approves renewal, the Board will make a final decision regarding renewal at its December meeting.

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Pro Forma CHARTER RENEWAL APPLICATION

This CHARTER RENEWAL APPLICATION applies to the SIAM Activity Group on Geometric Design. The SIAM Activity Group (or SIAG) to which this renewal applies was originally formed under the aegis of SIAM on July 16, 1989 by the SIAM Council and on July 19, 1989 by the SIAM Board of Trustees with its initial operating period beginning July 1, 1989 and ending December 31, 1992. Its charter has been renewed by the Council and Board three times thereafter. This SIAG has 125 members as of June 1, 2004.

According to its Rules of Procedure, the objective of the SIAG is to provide an environment for interaction between researchers and practitioners in the subjects of curve and surface design, solid modeling and manufacturing, computer graphics, supercomputing and graphics, and related topics.

Its proposed functions were to organize activities, including conferences and publications, to promote the interaction of practitioners and researchers and to keep the SIAM membership up to date on trends in geometric design.

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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?

The field is moving quickly, and the change in names of our conference reflects that: from “Computer-Aided Geometric Design” to “Geometric Design and Computing.” We see growth in activity in geometric

modeling related to visualization and medical imaging, for example. While the field of computer graphics is huge, with several very large conferences in the area, the activities of this SIAG occupy a special niche at the intersection of computer science and the mathematical sciences. While the SIAG has had a strong focus on surface modeling with splines for computer-aided design, topics added within the last ten years include scientific visualization, meshing methods, and multiresolution methods.

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 size of the SIAG is smaller than it was ten years ago, but seems to be stable. The SIAG has a new web site [http://www.sintef.no/static/AM/SIAM-SIAG/], a definite improvement. While the 2001 conference in Sacramento had a disappointing 163 attendees, the 2003 conference in Seattle drew a respectable 205 attendees. As an attendee remarked at the business meeting, this is the unique conference in this field in North America and occupies a unique niche bringing together academia and industry in applied geometry and geometric design. It attracts an even mix of attendees from math, computer science, and engineering departments.

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.

- 2001 Conference on Geometric Design and Computing, Sacramento. This was a good meeting scientifically, but attendance was lower than usual. The location and the events of 9/11 had an impact on the attendance.
- 2003 Conference on Geometric Design and Computing, Seattle. Attendance showed a 25.7% increase over the Sacramento meeting. Of the talks listed in the program, roughly ¼ were from people in industry. Of the academic speakers, roughly 1/3 were from math departments, 1/3 from computer science or related departments, and 1/3 from other departments (like mechanical engineering). Roughly 45.3% of the speakers were from the U.S., 39% from Europe, and 15.7% from other parts of the world (Asia, South America). A list of Invited Presentations and selected minisymposia is attached.

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?

The SIAG has not directly organized minisymposia at the SIAM Annual Meeting, although we have solicited minisymposia from SIAG members via e-mail.

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 has a new web page [http://www.sintef.no/static/AM/SIAM-SIAG/] and it is growing.

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

We are actively planning the next conference for the fall of 2005.

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

An occasional piece in *SIAM News* on the field or on the activity group might help.

Conference proceedings are another item that might help the conference. Given the large number of attendees from computer science departments, a conference proceedings becomes increasingly important to

attract the best speakers and to raise the perceived level of quality of the conference. We are discussing proceedings with the SIAM staff.

Since we do not have a SIAM journal, publishing the “best” talks in a related journal, such as Computer Aided Geometric Design, would be very helpful.

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

The field of geometric design is an important area that lies at the intersection of mathematics and computer science, bringing together research in applied geometry, approximation theory (splines and surface modeling, for example), and engineering applications in solid modeling (in vehicle design, for example), imaging, and other areas where geometric representation is essential. The SIAG is the only place within SIAM where applied geometry is emphasized, and the SIAG conference is the only one of its kind in North America. Emphasizing this field as part of applied mathematics and computing is important for SIAM, as part of its general goal of advancing applied mathematics and computing.

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

Signed

Gerald E. Farin
Chair, SIAG/GD
June 2004

Appendix to Charter Application

SIAG on Geometric Design
List of Invited Speakers and Minisymposium Topics
at Geometric Design and Computing
Seattle, Washington Nov 10, 2003

IP1. Geometry Generation for Analysis and Optimization
Thomas Grandine, The Boeing Company

IP2. Level Set Methods for Geometric Design and Computing
Stanley Osher, UCLA

IP3. A Generative Theory of Shape
Michael Layton, Rutgers University

IP4. Free Shape Representations for Efficient Geometry Processing
Leif Kobbelt, University of Aachen

IP5. Mid-Structures Linking Curved and Linear Geometry
Jorg Peters, University of Florida

IP6. Efficient Optimization of Polyhedral Shapes
Konrad Polthier, Technische Universitaet Berlin

IP7. Reverse Eningeering of Shapes – The State of the Art
Tamas Varady, Hungarian Academy of Science

IP8. Complexity and Reality in Equation Solving
J. Maurice Rojas, Texas A&M University

Selected Minisymposia:

PDEs and Level-Set Methods Applied to Shape
Geometric Models in Engineering Analysis Tools
Engineering Challenges in Geometric Modeling
Shape Preserving Curves and Surfaces
PDE Methods and their Application in Geometric Design
Efficient Processing of Large Data Sets for Shape Metrology
New Developments in Free-Form Subdivision Surfaces
Spherical Data Interpolation and Approximation
Computational Aspects of Paintings
Refinable Bivariate Splines for Surface Subdivisions
Geometric Modeling with Point Samples
Surface Mesh Parametrization
Experiences Developing and Using a Geometry Programming Language
Voronoi Diagrams in CAGD
Tonal Surfaces and their Applications to CAGD
Computational Methods for Shape Approximation
Rational Basis Functions for Surface Reconstruction
On Multiplying Points: How Sites Improve Blossoming