IAPR-TC18 - Discrete Geometry
Interim Report
Period 2014-2015

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1 Administrative information

The TC18 governing board is composed of three members:

- Isabelle Sivignon (CNRS researcher, GIPSA-lab, Grenoble, France): chair, in charge of the relationship with DGCI ;

- Partha Bhowmick (associate professor, Indian Institute of Technology, Kharagpur India): vice-chair, in charge of code repository and databases management ;

- Rocio Gonzalez-Diaz (associate professor, School of Computer Engineering, University of Seville, Spain): vice-chair, in charge of educational material, tutorials, challenges (open problems).

The number of members in TC18 (mailing list) is stable to **88**, but the list of members was cleaned up removing inactive email addresses and some new members were included.

A newsletter is usually sent to TC18 members twice a year, but this frequency also depends on the information we have to communicate. This last year has been quite quiet, but the mailing list is also used to send punctual information concerning PhD defenses, open positions, or TC18 topics related conferences call for papers between newsletters. The newsletters can be found on the website (`http://www.tc18.org/events.php`).

In this report, we choose to present past and future projects of the TC jointly according to the type of activity.

2 Relationships TC18/DGCI

2.1 DGCI Steering Committee

Since the creation of the TC18 more than ten years ago, a member of the TC18 board takes part in the Steering committee of the main TC18 conference DGCI (Discrete Geometry for Computer Imagery). This international conference takes place every 18 months. The Steering Committee is partially renewed at each DGCI edition. It is composed of:

- one organizer of the last six DGCI editions;

- some "permanent" members who carry with them the memory of the conference;

- a member of the TC18 board.

The last edition of DGCI took place in Sienna (Italy), from the 10th to the 12th of September, 2014 (`dgci-conference.org`).

The TC18 mailing list is also used, through the newsletter, to launch the call for candidates to organize the next DGCI edition. Generally, two or three applications are received, and the decision is taken during the DGCI SC meeting after careful reviews of the different application files. The next edition of DGCI will be hosted by Nantes, France in April, 2016. The call for papers has been launched very recently (see Appendix).

After the 2013 DGCI edition, special issues is two international journals were organized in DAM and CVIU in 2014. As part of the DGCI Steering Committee, the TC18 was implicated in the organization of the **CVIU special issue** (number of December, 2014).

Last, together with DGCI Steering Committee, a **survey** was sent to TC18 members last fall. This survey contained two parts: a big one about DGCI conferences (topics, why do people attend the conference, quality of the papers, etc), and a shorter one about the TC18. More than 50 researchers answered this survey. The first trend in the survey is that TC18 members feel equaly represented by the name "Discrete Geometry" and "Digitial Geometry". Indeed, if part of the community works on digital images, many people also work on approaches closer to discrete mathematics and combinatorics. The second trend is that the visibility of TC18 activities could greatly be enhanced. In the near future, we plan to reduce the intervals of time between successive newsletters, maybe with shorter news.

2.2 TC18 meeting

A TC18 meeting is scheduled during each DGCI conference, in plenary session. It generally consists in giving general information about the TC and the IAPR, novelties on the website and recall that the members are welcome to submit new material (images, educational, code). The slides presented during DGCI 2014 can be found on the TC18 website (`http://www.tc18.org/events.php#dgci`).

For DGCI 2016, we plan to use this time slot a bit differently: the idea is to organize an **open problem session**, where researchers could present theirs problems. This new session will be announced a few weeks before the conference so that the attendees will have some time to think about problems to present. As a result, we will update the list of open problems and challenges available on the TC18 website.

3 Visibility of DG activities

3.1 Image Gallery & List of recent journal papers

TC18 plays an important role in spreading the DG activities. In particular, we see the TC18 website as a showcase of our expertise and know-hows.

Since 2013, the **list of DG papers** published in major international journal is established every year. The journals considered can be found on the TC18 website. The list of papers is sent to TC18 members and available on the TC18 website (`http://www.tc18.org/educational.php#materials`). Even if this work is a bit tedious, it gives a interesting overview of the publications in DG.

Moreover, last year, we created an **image gallery** to enhance the display of TC18 members work (`http://www.tc18.org/gallery.php`). A call for images was launched through the newsletter to enrich this gallery. We did not receive a lot of contributions after this call. We will try again in the near future, and in the meantime, the gallery will be completed with images selected from the list of recent DG journal papers mentioned above.

3.2 Code and demos

In the last few years, a great effort has been made by the DG community to develop open-source libraries to spread DG tools and algorithms. The list of these libraries is given on the code webpage (`http://www.tc18.org/code_data_set/code.php`). These libraries make the programming and

cross-comparisons of algorithms easier, while ensuring sustainability and portability of the code. More and more DG papers now use these libraries. New releases of some of these libraries are announced through the TC18 mailing list.

3.3 Educational

We already have nice material available in the Educational section of the website. Following ICPR 2014 where a **tutorial on Discrete Geometry** was given by TC18 members, the slides of the presentations were added on the TC18 website (`http://www.tc18.org/subfields/distance_skeletons/index.php`).

3.4 Projecting DG to allied groups

Digital geometry remains a small community linked to many other research areas, and our group does not seem to be expanding in pace with other close research areas. The TC18 board is well aware of this situation and even if some specific actions have already been implemented (choice of DGCI invited speakers from other IAPR TCs or allied research groups, call for projects involving other TCs), further steps should clearly be undertaken in the near future.

4 Appendix - DGCI 2016 Call for papers

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First Call for Papers

19th IAPR International Conference on
DISCRETE GEOMETRY for COMPUTER IMAGERY (DGCI 2016) 18-20 April 2016
Nantes, France
http://dgci2016.univ-nantes.fr

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Call for Papers

The aim of the DGCI conference is to gather researchers in discrete models, discrete geometry and topology, with applications in image analysis and image synthesis.

Discrete geometry plays an expanding role in the fields of shape modelling, image synthesis, and image analysis. It deals with topological and geometrical definitions of digitized objects or digitized images and provides both a theoretical and computational framework for computer imaging.

This edition of DGCI follows the successful 2014 edition held in Siena, Italy. DGCI 2016 is organized by the Image and Video Communication team (IVC, IRCCyN UMR CNRS 6597) of Polytech Nantes (University of Nantes).

The main topics of interest include (but are not limited to):

- Models for Discrete Geometry (grids, discrete objects, discrete model properties, digitization schemes, metrics...).

- Discrete and Combinatorial Topology.

- Geometric Transforms (image mappings, distance transformation, skeletons and medial axis...).

- Discrete Shape Representation, Recognition and Analysis.

- Discrete Tomography.

- Morphological Analysis.

- Discrete Modelling and Visualization.

- Discrete and Combinatorial Tools for Image Segmentation and Analysis.

Submissions and general information

Authors are required to submit in the online submission system in PDF format, a non-anonymous abstract of 250 words at most. Each abstract should clearly specify the achieved results and their significance in the related scientific area.

Articles should be prepared according to the LNCS recommendations and templates, submitted in the online submission system, and they should be at most twelve pages long. All papers must be submitted before the submission deadline. Keep in mind that papers that deviate too much from our guidelines will be returned to the authors. Submissions will be peer-reviewed by at least two qualified reviewers only after they satisfy our requirements to a minimal degree. Please remember that articles should be self-contained. If supplementary material are needed (additional results, technical report with detailed mathematical derivations...), they must be submitted alongside with the main article.

Authors of accepted papers must guarantee their presence at the conference. The proceedings will be published by Springer in the Lecture Notes in Computer Science series.

Additionally, a few presentation slots will be made available in the scientific program to allow researchers to present to the community their results that have been already published in a Journal. In this case, nothing will be published in the proceedings but we let the opportunity to researchers to share their results to the DGCI community. To apply, please contact the Organization Committee before the DGCI submission deadline (see below).

Important dates

- Title + abstract submission: October 11th, 2015

- Full paper submission: October 18th, 2015

- Full paper notification: January 15th, 2016

Proceedings

The proceedings of the conference will be published in the Lecture Notes in Computer Science series by Springer-Verlag.

Steering Committee
David Coeurjolly (President of SC, France)
Eric Andres (France)
Gunilla Borgefors (Sweden)
Srecko Brlek (Canada)
Jean-Marc Chassery (France)
Isabelle Debled-Rennesson (France)
Andrea Frosini (Italy)
Maria Jose Jimenez (Spain)
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Isabelle Sivignon (France)

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Nicolas Normand
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Vincent Ricordel
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Contact

For contacts and further information check the DGCI 2016 web site (http://dgci2016.univ-nantes.fr) or write to dgci2016@univ-nantes.fr