IAPR TC 18 “Discrete Geometry”

DGCI 2014, September 10-12, 2014
Facts

Team

▶ Isabelle Sivignon
  Researcher, GIPSA-lab, Grenoble, France
  Chair, in charge of the relationship with DGCI

▶ Partha Bhowmick
  Ass. Professor, Indian Institute of Technology, Kharagpur, India
  Vice-chair, in charge of code repository and databases management

▶ Rocio Gonzalez-Diaz
  Ass. Professor, School of Computer Engineering, University of Seville, Spain
  Vice-chair, in charge of educational material, tutorials, challenges (open problems)

Members
84 on the mailing list (+7 compared to 2013)
What happened since DGCI 2013?

Research initiatives

▶ Special Issues after DGCI 2013
  ▶ **Discrete Applied Mathematics**: 24 submitted papers, 8 accepted, 9 rejected, 5 out of scope, 2 still under review.
  ▶ **Computer Vision and Image Understanding**: 14 submitted papers, 6 accepted, 7 rejected, 1 out of scope.

▶ Special Issues after DGCI 2011
  ▶ **(Computer Vision and Image Understanding)**, Vol 117, Issue 4, April 2013, 12 papers
  ▶ **Image Processing Online**: 6 demos are now online - between 50 and 100 archived tests in 6 months for each demo.

▶ Special Issue after IWCI.A 2013
TC18 initiatives

New services

- relooked website
- list of major journal papers published in 2013: sent in the newsletter
- alert on PhD defenses
- image gallery

We need your contributions

- PhD defenses alerts
- images for the gallery

Feel free to give your feedback on our actions!
General comments for all TCs

▶ mention key challenges
▶ mention major projects or initiatives
▶ provide datasets and evaluation methodology
▶ IAPR budget to support collaborations with other TCs
Future directions of TC18

Administrative
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Administrative


Website

- Renew the list of open problems

Open Problems in Digital Geometry and Topology

A website on open problems in digital and image geometry has been suggested during the Winter School DIO2000 at Dagstuhl/Germany.

Problems to be published on this website may be posted to mi-webmaster@ewi.tudelft.nl in pdf format. Please limit your file submissions to just (about) 2 pages and use the format shown in this template file. They will be published in the list below together with the date when received, your name (with a link to your email address), and links provided by you for related publications, test data, web sites, etc.

Responses to the published problems will be inserted into the table, next to the related problem. A response should also be in pdf format (about 2 pages) and may include links to further material.

<table>
<thead>
<tr>
<th>Date</th>
<th>Problem/Response</th>
<th>(First) Author</th>
<th>Links</th>
</tr>
</thead>
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<tr>
<td>9, May 2001</td>
<td>3 Surface Area Estimation</td>
<td>Reinhard Klette</td>
<td>CITR-TR-87</td>
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<tr>
<td>11, September 2001</td>
<td>1.1 Estimation algorithm and multifield convergence proof</td>
<td>David Cozzioli</td>
<td>Technical Report</td>
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<td>10, May 2001</td>
<td>2 Superlinear Convergence for Length Estimation</td>
<td>Reinhard Klette</td>
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<tr>
<td>22, June 2001</td>
<td>3 Axisymmetric 3-D Digital Topology</td>
<td>T. Yung Kong</td>
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<tr>
<td>11, August 2001</td>
<td>4 Binary Codes for Counting Digital Topologies</td>
<td>Akashki Iyaga</td>
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<tr>
<td>11, September 2001</td>
<td>5 Minimal-Number DSS and DPS Segmentations</td>
<td>Azriel Rosenfeld</td>
<td>CITR-TR-95</td>
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<td>27, January 2006</td>
<td>6.1 On the min DSS problem of closed discrete curves</td>
<td>Fabien Feschet</td>
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<tr>
<td>4, May 2009</td>
<td>5.2 Minimum decomposition of a digital surface into digital plane segments is NP-hard</td>
<td>David Cozzioli</td>
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<td>16, April 2002</td>
<td>6 MLP Line-estimation 3D Length Estimation</td>
<td>Thomas Buskow</td>
<td>CITR-TR-55</td>
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<td>17, February 2003</td>
<td>7 Connectivity Number</td>
<td>Valentin Brimkov</td>
<td>CITR-TR-125</td>
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<td>23, April 2004</td>
<td>8 List collected on a 2004 Dagstuhl seminar</td>
<td>Reinhard Klette</td>
<td></td>
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<tr>
<td>01, November 2004</td>
<td>9.1 Vertices of the digital line(hyper)plane segment polytope</td>
<td>Valentin E. Brimkov</td>
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<td>8.2</td>
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<tr>
<td>01, November 2004</td>
<td>9 Convex digital curve segmentation</td>
<td>Valentin E. Brimkov</td>
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<td>13, December 2004</td>
<td>10 The convex skull problem</td>
<td>Jean-Marc Cazayou</td>
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<td>15, January 2005</td>
<td>11 Animal and B-Problems</td>
<td>Akira Nakamura</td>
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<td>17, September 2007</td>
<td>11 Surface Area Estimation with Non-Cubic Voxels</td>
<td>Nahum Krijet</td>
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Future directions of TC18

Administrative

Website

► Renew the list of open problems
► List major projects
► Enrich the gallery
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Links with other TCs
DGCI invited speakers, collaborations between teams, summer school.
IAPR sponsorship possible.
IAPR - TC18 Digital Geometry

Geometry for digital image analysis.

What is TC18?

The aim of this IAPR-Technical Committee is to promote interactions and collaboration between researchers working on discrete geometry. Conferences and a TC web page are provide these opportunities. The topic is not covered by other IAPR-TCs, but has links with some of them.

The main conference is the Discrete Geometry for Computer Imagery (DGC) conference. DGC is a series of conferences of which the first was held in 1991 in Strasbourg, and now held every 18 months. It is an international conference by its participants, its scientific committee and its location. Since the 6th DGC (November 1996), proceedings have been published by Springer Verlag, in the Lecture Notes in Computer Science series.

In combination with each DGC, a TC meeting is held to give the possibility for the members to discuss the activity of the TC. An electronic newsletter is sent regularly to the members.

The TC18 web page is maintained in order to access easily information on on-going research for researchers active within the field, as well as information on basic notions for researchers in related fields, or interested in starting an activity in discrete geometry. You will find a lot of information on this web page, so have a nice visit!
Gallery

IAPR - TC18 Digital Geometry

Geometry for digital image analysis.

Scope  Organisation  Educational  Image and Code databases  Events and positions  Gallery  Contact Us

Gallery


Binary object obtained from relaxed image segmentation. The non-processed image suffers from topological alterations during postion, due to the small size of linear structures. The regularized image, generated by a coupled Khalimsky grid embedding, is no longer affected by topological changes.

Parameter space of 2-dimensional continuous rigid transformations (x, y; translation) subdivided into cells that represent the associated discrete rigid transformations. The visualized surfaces correspond to limit cases at the frontier between pixels.

