



International Association for
Pattern Recognition

Technical Committee 10
Graphics Recognition

Activity report for the period: June 2007 – September 2008

<http://www.iapr-tc10.org/>

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1. TC-10 AIMS AND SCOPE

Graphics recognition is a particular topic in the field of computer vision, and more specifically in the domain of document analysis, devoted to the analysis of any kind of graphical information. Along with optical character recognition (OCR) and document layout analysis, graphics recognition forms the broader area of document image analysis and recognition. Examples of graphic documents are maps, plans, tables, diagrams and drawings, graphical symbols in PDAs, pen-based user interfaces, etc. The relevance of research in graphics recognition comes from both scientific contribution and application development.

From the scientific point of view, graphics recognition has significantly contributed to research in computer vision and pattern recognition methods. Many different tasks are involved in the analysis of graphical information, covering all steps of image analysis systems: from low-level techniques, such as binarization, noise removal or vectorization, to pattern recognition methods for symbol recognition and knowledge-based systems for semantic interpretation.

From the application point of view, graphics recognition can be applied to a wide range of problems: raster-to-vector conversion of the huge amount of existing plans and maps, 3D-reconstruction, semantic drawing interpretation, information retrieval and navigation in large sets of graphic documents or development of more friendly user interfaces through input of graphic information with pen-based systems.

IAPR's Technical Committee 10 on Graphics Recognition promotes interaction among researchers working in document image analysis in general, and *graphics recognition* in particular. Topics of primary interest to members of this Technical Committee are:

- Raster-to-vector techniques.
- Recognition of graphical primitives.
- Recognition of graphic symbols in charts, diagrams, and drawings.
- Interpretation of engineering drawings, maps, charts, tables, diagrams, and other graphical documents.
- 3-D models from multiple 2-D views (line drawing).
- Performance evaluation in graphics recognition.
- Systems for graphics recognition.
- Graphics-based information retrieval and browsing.
- Graphics multimedia and web-based documents.
- Graphics-based user interfaces.

The former TC10 chairs were: R. Kasturi (USA), K. Tombre (France), A. Chhabra (USA), Y.B. Kwon (Korea), and J. Lladós (Spain). Continuing with the work of these chairs, in the current chairmanship the goal is to continue in the direction of promoting activities and the exchange of new ideas and knowledge among active researchers in the field of graphics recognition and other related fields as well.

2. TC-10 STRUCTURE AND ORGANIZATION

2.1. Chairmanship

In the last ICPR (2006) in Hong Kong, the following chairmanship was proposed for one term (until ICPR'2008 in Tampa, Florida, USA) and then approved later by the First VP of IAPR:

- TC10 chair: Dr. Liu Wenying, City University of Hong Kong, HKSAR, China.
- TC10 vice-chair: Dr. Jean-Marc Ogier, Université de la Rochelle, France.

2.2. Membership and Mailing list

Currently, TC-10 has more than 250 members worldwide registered in the distribution list, which was updated in May 2007 to remove inactive or repeated addresses. TC-10 members are periodically informed through the member mailing list about graphics recognition activities and news.

3. EVENTS

TC-10 collaborates and promotes the organization of two main events. First, The Graphics Recognition (GREC) Workshop series, every two years, is the main activity of the Graphics Recognition community. Second, The International Conference on Document Analysis and Recognition (ICDAR), is the main activity of the whole document analysis community, organized jointly by TC-10 and TC-11 every two years. Both events had been held in September 2007 successfully. This was the first time when the two events were held at the same place. TC10 had focused its main activities of the 2006-2007 year in organizing and supervising the organization of these events.

3.1. 9th International Conference on Document Analysis and Recognition



Conference chairs:

General chairs:

F. Bortolozzi (OPET, Brazil)
R. Sabourin (ETS, Canada)

Program Chairs:

A. Belaïd (LORIA, France)
D. Doermann (University of Maryland, USA)
H. Fujisawa (Hitachi, Japan)

Conference home page: <http://www.ICDAR2007.org>

ICDAR'2007 took place in Curitiba (Brazil), September 23 – September 26, 2007. There were 378 paper submissions, of which 251 were accepted. Of the accepted papers, 102 were scheduled for oral presentations and 149 for poster sessions. The final program spent 3 days and was made up of:

- 4 invited talks.
- 21 oral sessions in 3 parallel tracks.
- 3 poster sessions.

The following satellite events were held before the conference:

- 2nd International Workshop on Camera-based Document Analysis & Recognition (CBDAR)
- 7th IAPR International Workshop on Graphics Recognition (GREC2007)

During ICDAR2007, the organizers of ICDAR'2009 (to be held in Barcelona, Spain) also reported their preparation and the ICDAR Advisory Board also examined the ICDAR'2011 proposal and agreed that ICDAR'2011 be held in Beijing, China, September 18-21, 2011, organized by Prof. Xiaoqing Ding and Chenglin Liu.

3.2. 7th International Workshop on Graphics Recognition

Workshop chairs:

General Chair:

Josep Lladós
Computer Vision Center, Universitat Autònoma de Barcelona, Spain
e-mail: josep@cvc.uab.es

Program Co-Chairs:

Liu Wenying
Department of Computer Science, City University of Hong Kong
email: csluiwy@cityu.edu.hk

Jean-Marc Ogier
Laboratoire L3i, Université de La Rochelle, France
jean-marc.ogier@univ-lr.fr

Workshop home page:

<http://www.buyans.com/grec2007/>

The IAPR International Graphics Recognition Workshop (GREC) is the main activity of the IAPR-TC10. The Seventh edition (GREC2007) was held in the Grand Hotel Rayon, Curitiba (Brazil) in September 20-21, 2007 previously to the 9th International Conference on Document Analysis and Recognition (ICDAR2007). GREC2007 was chaired by Josep Lladós, Liu Wenyin and Jean-Marc Ogier. 39 valid papers were presented in the scientific program. The workshop had 49 registered participants from 13 countries.

Following the tradition of the previous workshops in the series, the scientific program was organized in a single-track 2-day workshop. It comprised 6 sessions dedicated to specific topics. Session topics included: Technical documents, maps and diagrams understanding; Symbol and shape description and recognition; Information retrieval, indexing and spotting; Sketching interfaces and on-line processing; Feature and primitive analysis and segmentation; and Performance evaluation and ground truthing. We aimed to restore the original GREC model, a true workshop with interaction rather than a mini-conference. With this purpose, only extended abstracts were published given the opportunity to present works in any maturity stage. Electronic proceedings with full papers were available to registrants allowing "electronic" discussions previously to the workshop. Authors gave short presentations, leaving time to panel discussions. Finally, the role of chairpersons was of key importance in this format. Session chairs were asked not just to introduce speakers, but to read papers before his/her session, and to prepare a survey presentation on the topic and a list of questions to foster active discussions, and encouraging participation.

The last session of GREC2007 consisted in a panel discussion chaired by Karl Tombre. He prepared an excellent summary of the issues discussed during two days, and addressed the hot topics on the present and the future of Graphics Recognition. Twenty-eight selected papers of GREC2007 and a few invited papers were published in a book of Springer LNCS series (Vol. 5046, see Section 4.3 for more details).

Continuing with the tradition of past GREC workshops, the program of GREC2007 included graphics recognition contests. In particular, two contests were held: an arc segmentation contest, organized by Daniel Keysers, and a symbol recognition contest, organized by Philippe Dosch and Ernest Valveny.

The GREC2007 participants had the opportunity to socialize, spending one day after the workshop in the historic city of Lapa. It was a nice trip with a lunch in a farm surrounded by araucarias, the typical tree of the Parana State.

During the Workshops, the next workshop, GREC2009 was decided to be held in La Rochelle (France) in July 2009. It will be organized by Jean Marc Ogier (Université de La Rochelle).

3.3. International Graphics Recognition Contests

Two contests were held during GREC'2007: The fourth arc segmentation contest was organized by Daniel Keysers and Thomas M. Breuel. The third symbol recognition contest was organized by Ernest Valveny and Philippe Dosch. Contests are useful not only to evaluate the state-of-the-art on algorithms related to different problems of graphics recognition, but also to provide evaluation databases to the community. In GREC'2007, new editions of the same contests were organized.

Arc Segmentation Contest

Arc segmentation is a classical process related to vectorization and line drawing interpretation. In GREC'2007 a new edition of such contest were done with new performance evaluation protocol introduced. The summary of this edition is presented as a paper in LNCS vol. 5046, which can be downloaded at <http://www.springerlink.com/content/6m46011821270641/?p=11560734e3514e31b8028d74c6b7282&pi=28>.

Contest chair: Daniel Keysers and Thomas M. Breuel
Image Understanding and Pattern Recognition Research Group
German Research Center for Artificial Intelligence (DFKI GmbH)
and University of Kaiserslautern, Germany
E-mail:{daniel.keysers, thomas.breuel}@dfki.de

Contest home page: <http://www.iupr.org/arcseg2007>

Symbol Recognition Contest

Following the experience of the previous two contests on Symbol Recognition at GREC'2003 and GREC2005, a new edition of the contest were held during GREC'2007. The summary of this edition is presented as a paper in LNCS vol. 5046, which

Contest chairs:

Ernest Valveny
Computer Vision Center - Dept. Informàtica
Universitat Autònoma de Barcelona
Barcelona, Spain
e-mail: ernest@cvc.uab.es

Philippe Dosch
LORIA
Nancy, France
e-mail: Philippe.Dosch@loria.fr

Contest home page: <http://symbcontestgrec05.loria.fr/>

4. OTHER ACTIVITIES

4.1. ICDAR Steering Committee (Advisory Board)

The TC10 chair is a member of the ICDAR steering committee (Advisory Board). Such committee was installed in 2001 in order to (a) keep track of the organisational process of current and forthcoming ICDAR conferences, and (b) to maintain the organisational and 'cultural' coherence in this conference series. The members of the current edition of the ICDAR steering committee are: Karl Tombre (IAPR President, former ICDAR organizer), Apostolos Antonacopoulos (chair of the IAPR C&M committee), Andreas Dengel (former ICDAR organizer), Liu Wenyin (TC10 chair), and Jianying Hu (TC-11 chair, also chair of the ICDAR Advisory Board).

4.2. IAPR/ICDAR Awards

An ICDAR Award Program has been established to recognize individuals who have made outstanding contributions to the field of Document Analysis and Recognition in one or more of the following areas:

- Research
- Training of students
- Research/Industry interaction
- Service to the profession

Every two years, two awards categories are presented, namely, the Young Investigator Award (less than 40 years old at the time the award is made) and the Outstanding Achievements Award. Each award consists of a token gift and a suitably inscribed certificate. The organization of the ICDAR Award Program was done by IAPR TC-10 and TC-11. A call for nominations were distributed among ICDAR, TC10 and TC11 mailing lists and also the ICDAR and IAPR web pages. The final decision was made by the Awards Committee that consists of the following people:

- Jianying Hu, TC11 chair and chair of the ICDAR Awards Committee
- Liu Wenyin, TC10 chair
- David Doermann, IJDAR chief editor
- Robert Soborine, ICDAR07 general chair
- Young-bin Kwon, TC10 representative
- Apostolos Antonacopoulos, TC11 representative and previous winner of the Young Investigator Award
- Ching Y. Suen, Previous winner of the Outstanding Achievements Award

This year the ICDAR Awards Committee had discussed on the naming issues of the two awards. Finally, they were named as the Young Investigator Award and the Outstanding Achievements Award, respectively, and will be used consistently in the future editions.

This year, the committee had received one nomination for the Outstanding Achievements Award and three nominations for the Young Investigator Award. Finally, the committee decided to award Dr. Hiromichi Fujisawa (Hitachi, Japan) the Outstanding Achievements Award and Dr. Josep Lladós (UAB, Spain) the Young Investigator Award. The awards ceremony were held during ICDAR'2007 in Curitiba (Brazil).

4.3. LNCS post-GREC2007 volume

Traditionally, after the GREC workshop, a selection of best papers is published in a volume of Lecture Notes in Computer Science (Springer). Edited volumes from the previous workshops in the series are available as *Lecture Notes in Computer Science*: LNCS Volume 1072 (GREC95 in Penn State University, USA), LNCS Volume 1389 (GREC97 in Nancy, France), LNCS Volume 1941 (GREC99 in Jaipur, India), LNCS Volume 2390 (GREC01 in Kingston, Canada), LNCS Volume 3088 (GREC03 in Barcelona, Spain), and LNCS Volume 3926 (GREC05 in Hong Kong, China). The book corresponding to GREC'2007 was published in Sept 22, 2008. More details on the book contents are:

LECTURE NOTES IN COMPUTER SCIENCE - Volume 5046

Graphics Recognition. Graphics Recognition: Recent Advances and New Opportunities

7th International Workshop, GREC 2007, Curitiba, Brazil, September 2007

Selected Papers

Liu Wenyin, Josep Lladós, and Jean-Marc Ogier (editors)

Springer Verlag. Sept 22, 2008 (336p). ISSN: 0302-9743 (Print) 1611-3349 (Online), ISBN: 978-3-540-88184-1, DOI:10.1007/978-3-540-88188-9

The table of contents is given at <http://www.springerlink.com/content/978-3-540-88184-1/>.

5. 2008-2009 WORKPLAN

The main objectives for the next year are still the classical activities: GREC workshop, ICDAR conference, ICDAR Awards.

- Especially, GREC'2009 will be held in University of La Rochelle, La Rochelle, France, July 22-23 July, 2009, organized by Prof. Jean-Marc Ogier. Its homepage is at <http://grec2009.univ-lr.fr>.

For this session of GREC 2009, different contests will be organized, and a session dedicated to industrial companies will be organized, in order to develop links with companies. A panel discussion will be organized, in order to create research connection between TC 10 researchers and companies.

- ICDAR'2009 will be held in July 2009 at the campus of the Universitat Autònoma de Barcelona, chaired by Josep Lladós.

Important dates:

Manuscript due: January 12, 2009

Acceptance notification: April 15, 2009

Camera-ready manuscript due: May 15, 2009

Advance registration due: May 15, 2009

Workshop proposals due: September 30, 2008

Tutorial proposals due: December 1st, 2008

Competition proposals due: December 1st, 2008