

International Association for Pattern Recognition

TC 16

"Algebraic and Discrete Mathematical Techniques in Pattern Recognition and Image Analysis"

INTERIM ACTIVITY REPORT FOR THE PERIOD -IX/2010 - VI/2011

1. Leadership Board

a. Organizational Structure

a1. Chairman:

Professor Yuri Zhuravlev

Full Member of the Russian Academy of Sciences

IAPR GB Member

Chairman of the National Committee of the Russian Academy of Sciences for Pattern Recognition and Image Analysis

Institution of the Russian Academy of Sciences "Dorodnicyn Computing Centre of the RAS", Moscow, The Russian Federation

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a2. Vice-Chairmen:

Dr.-Eng. Igor Gurevich

Scientific Secretary of the National Committee of the Russian Academy of Sciences for Pattern Recognition and Image Analysis

IAPR Fellow

IAPR GB Member

IAPR contact person for the National Committee of the Russian Academy of Sciences for Pattern Recognition and Image Analysis (IAPR member society)

Institution of the Russian Academy of Sciences "Dorodnicyn Computing Centre of the RAS", Moscow, The Russian Federation

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Professor Heinrich Niemann

IAPR Fellow

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Professor Gerhard Ritter

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a3. TC 16 Scientific Secretariat:

Dr. Yulia Trusova

Institution of the Russian Academy of Sciences “Dorodnicyn Computing Centre of the RAS”, Moscow, The Russian Federation

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Dr. Vera Yashina

Institution of the Russian Academy of Sciences Dorodnicyn Computing Centre of the RAS, Moscow, The Russian Federation

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a4. Members of the Board

a5. Members of TC 16

253 members (Asia, Europe, The Russian Federation, USA, Canada, Central and South America).

b. Membership (terms)

Membership in TC 16 is open to scientists, academics, professionals, PhD students and students who are interested in the advancement of algebraic and discrete mathematics techniques for image analysis and pattern recognition. To request a membership, the online request form should be completed. The form is available at the TC 16 website: <http://www.ccas.ru/tc16/> (see section “Membership”).

2. Activities of the Past Six Months

- Preparation of special issues of the international journal “Pattern Recognition and Image Analysis. Advances in Mathematical Theory and Applications” devoted to scientific events organized by TC16.
- Preparation of special thematic special issue of the international journal “Pattern Recognition Letters” “Modern Algebras and Discrete Mathematics Techniques for Image Analysis and Pattern Recognition” (to be published in 2012).
- Development of the ontology of the subject domain “Mathematical Theory of Pattern Recognition and Image Analysis”.
- Forming of the TC 16 Leadership Board.
- Extension the membership in TC 16.

- Confirmation by PRIA scientists and professionals its membership in TC 16.
- Monitoring the state-of-the art in the domain of algebraization of image analysis and pattern recognition.
- Updating and discussing of the list of break-through research topics in the domain of algebraization of image analysis and pattern recognition.
- Updating and discussing the list of challenging and interesting research problems.
- Collecting, creating and preparing for presentation at the website different kinds of educational materials.
- Collecting, creating and preparing for presentation at the site bibliographical lists, lists of Internet resources and publications in the fields of TC 16 competence.
- Participation in organization of the following scientific events:
 - 8th Open German/Russian Workshop on Pattern Recognition and Image Understanding (OGRW-8-2011), Nizhny Novgorod, The Russian Federation, 2011;
 - 4th International Workshop “Image Mining. Theory and Applications” (IMTA) (in conjunction with International Conference on Health Informatics – HEALTHINF 2012), Algarve, Portugal, February 2012;
 - 11th International Conference "Pattern Recognition and Image Analysis: New Information Technologies" (PRIA-11-2012), Nizhny Novgorod, The Russian Federation, October 2012.

3. Plans until ICPR 2012 and Beyond

a. Website Updates

i. Educational Materials

▪ Tutorials

- The electronic version (in pdf-format) of the book "Handbook of Computer Vision Algorithms in Image Algebra" (authors: G.Ritter, J.N.Wilson; published by CRC Press, Inc, 1996);
- The electronic version (in pdf-format) of the book “Image Algebra” (author: G.X.Ritter; Center for computer vision and visualization, Department of

Computer and Information science and Engineering, University of Florida, Gainesville, FL 32611, 2001;

- The PowerPoint presentation of the talk “Image Formalization via Descriptive Image Algebras (authors: I.Gurevich, V.Yashina) presented at the the 3rd International Workshop on Image Mining Theory and Applications - IMTA 2010 (in conjunction with VISIGRAPP 2010), Angers, France, May 2010;

- Application Areas

- The PowerPoint presentation of the talk “An Image-based Framework for Intellectual Decision Making in Medical Research” (authors: S.Colantonio, I.Gurevich, O.Salvetti, Yu.Trusova) presented at the 3rd International Workshop on Image Mining Theory and Applications - IMTA 2010 (in conjunction with VISIGRAPP 2010), Angers, France, May 2010;
- The PowerPoint presentation of the talk “An Algorithmic Scheme for Construction and Investigation of Parkinson's Disease Model” (authors: I.Gurevich, E.Kozina, A.Myagkov, H.Niemann, M.Ugrumov, V.Yashina) presented at the 3rd International Workshop on Image Mining Theory and Applications - IMTA 2010 (in conjunction with VISIGRAPP 2010), Angers, France, May 2010;
- The PowerPoint presentation of the talk “A New Image-Mining Technique for Automation of Parkinson's Disease Research” (authors: I.Gurevich, A.Myagkov, V.Yashina) presented at the Workshop on Discrete Geometry and Mathematical Morphology (WADGMM), Istanbul, August 22, 2010;

- Successful Projects

- In 2005 TC 16 began the construction of bilingual thesaurus for the subject domain "Mathematical Theory of Pattern Recognition and Image Analysis". The development of a working version of the thesaurus was completed. It is presented at the TC16 website (electronic version in doc-format). It is used currently as a base for constructing the ontology of the subject domain "Mathematical Theory of Pattern Recognition and Image Analysis";

- Demos
- “BlackSquare – Open System for Automation of Scientific Research in Image Understanding” (PowerPoint presentation);
- ii. Reference Resources
 - Bibliography
- Regularly updated list of research papers on TC16 competence domain;
- New selected publications on TC16 competence domain (electronic versions of papers in pdf-format);
- Regularly updated list of journals on TC16 competence domain;
 - Datasets, Evaluation Tools
- Since TC 16 activity is mostly devoted to fundamental research, the specific datasets and evaluation tools are not necessary at the current stage.

b. Activities

i. Events

The Meetings of TC16 are preliminary planned in conjunction with:

- 8th Open German/Russian Workshop on Pattern Recognition and Image Understanding (OGRW-8-2011), Nizhny Novgorod, The Russian Federation, 2011;
- 4th International Workshop “Image Mining. Theory and Applications” (IMTA) (in conjunction with International Conference on Health Informatics – HEALTHINF 2012), Algarve, Portugal, February 2012;
- 11th International Conference "Pattern Recognition and Image Analysis: New Information Technologies" (PRIA-11-2012), Nizhny Novgorod, The Russian Federation, October 2012;
- 21th International Conference on Pattern Recognition (ICPR-2012), Tsukuba, Japan, November 2012.

Participation in organization of the following scientific events:

- 8th Open German/Russian Workshop on Pattern Recognition and Image Understanding (OGRW-8-2011), Nizhny Novgorod, The Russian Federation, 2011;
- 4th International Workshop “Image Mining. Theory and Applications” (IMTA) (in conjunction with International Conference on Health Informatics – HEALTHINF 2012), Algarve, Portugal, February 2012;
- 11th International Conference "Pattern Recognition and Image Analysis: New Information Technologies" (PRIA-11-2012), Nizhny Novgorod, The Russian Federation, October 2012.

ii. Publicity

- Preparation for publication of Proceedings of conferences and workshops organized by/or with TC16 participation as well as special issues of the international journal “Pattern Recognition and Image Analysis. Advances in Mathematical Theory and Applications” devoted to scientific events organized by TC16.

iii. Other

- TC16 will continue developing the ontology of the subject domain “Mathematical Theory of Pattern Recognition and Image Analysis”. TC 16 needs financial support from IAPR for maintaining the development of the corresponding ontology.
- Attraction of new members. Geographical and professional extension of TC 16 membership.

4. Proposal

We consider that IAPR TCs in general and IAPR TC 16 in particular should be involved directly into ICPR preparation in the following aspects:

- a) Defining ICPR program topics in the TC competence domain;
- b) Defining ICPR invited speakers in the TC competence domain;
- c) Defining ICPR PC members;
- d) Defining ICPR program topics in the TC competence domain;

e) ICPR papers reviewing in the TC competence domain.

5. Conclusion

We consider that IAPR TC 16 is working successfully in accordance with actual aspects of its competence domains and its plans.

The Leadership Board of IAPR TC 16 will continue its activity in accordance with its goals and plans.

Chairman of TC16

Yuri Zhuravlev

Institution of the Russian Academy of Sciences Dorodnicyn Computing Centre of the RAS, Moscow, Russian Federation

Full Member of the Russian Academy of Sciences

IAPR GB Member

Vice-Chairmen of TC16:

Dr.-Eng. Igor Gurevich

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June 17, 2011