IMTA

4th International Workshop on Image Mining. Theory and Applications IMTA-2013 February 23, 2013 Barcelona, Spain

In conjunction with the 8th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications - VISIGRAPP 2013

Workshop Co-chairs:

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http://www.visigrapp.org/IMTA.htm

The main purpose of the IMTA-workshop is to provide the fusion of modern mathematical approaches and techniques for image analysis/pattern recognition with the requests of applications.

The IMTA-4 will continue the series of workshops devoted to modern mathematical techniques of image mining and to corresponding applications. The IMTA-4-2013 will be conducted in cooperation with the Technical Committee No.16 "Algebraic and Discrete Mathematical Techniques in Pattern Recognition and Image Analysis" of the International Association for Pattern Recognition and with the National Committee for Pattern Recognition and Image Analysis of the Russian Academy of Sciences. The workshop will consist of a small number of invited talks, contributed talks, and informal discussions, and a wrap-up session.

Scope

Automation of image mining is one of the most important strategic goals in image analysis, recognition and understanding both in scientific and technological aspects. The main subgoals are developing and applying of mathematical theory for constructing image models and representations accepted by efficient pattern recognition algorithms and for constructing standardized representation and selection of image analysis transforms. Automation of image mining is possible by combined application of mathematical theory of image analysis/understanding/recognition and mathematical theory of pattern recognition.

Automation of image processing, analysis, estimating and understanding is one of the crucial points of theoretical computer science having decisive importance for applications, in particular, for diversification of solvable problem types and for increasing the efficiency of problem solving.

The role of an image as an analysis and estimation object is determined by its specific and inalienable informational properties. Image is a mixture and a combination of initial (raw, "real") data and its representation means, of computational procedures results and of the physical nature and of the models of objects, events and processes to be represented via an image.

The specificity, complexity and difficulties of image analysis and estimation (IAE) problems stem from necessity to achieve some balance between such highly contradictory factors as goals and tasks of a problem solving, the nature of visual perception, ways and means of an image acquisition, formation, reproduction and rendering, and mathematical, computational and technological means allowable for the IAE.

The mathematical theory of image analysis is not finished and is passing through a developing stage. It appeared not so long ago that only intensive creating of comprehensive mathematical theory of image analysis and recognition (in addition to the mathematical theory of pattern recognition) could bring a real opportunity to solve efficiently application problems via extracting from images the information necessary for intellectual decision making. The transition to practical, reliable and efficient automation of image mining is directly dependent on introducing and developing of mathematical means for IAE.

The participants will enjoy the opportunity to discuss a methodology, mathematical and computational techniques for automation of image mining on the base of mathematical theory for IAE. Another important task of the workshop is to discuss linguistic tools for image mining – image knowledge bases and image science ontologies – and to estimate the prospects of the algebraic approach in representation of image analysis knowledge in this environment.

The interpretation of mathematical and linguistic techniques will be illustrated by application problems, mainly from biology and medicine, automation of scientific research, and many other domains generating breakthrough and difficult application tasks.

Workshop Areas

This workshop is intended to cover, but it is not limited to, ***the following topics****:*

1. ***New Mathematical Techniques in Image Mining***
   - ***Algebraic Approaches***
   - ***Discrete Mathematics Techniques***
   - ***Descriptive Techniques and Data Representation Problems***
   - ***Structural and Syntactic Techniques***
   - ***Multiple Classifiers***
   - ***Pattern Recognition Techniques in Image Mining Environment***
   - ***Other Mathematical Techniques***
   - ***Machine Learning***
2. ***Image Models , Representations and Features***
3. ***Automation of Image Mining***
   - ***Image Mining, Computer Vision and Knowledge-Based Systems***
   - ***Image Databases***
   - ***Image Knowledge Bases***
   - ***Image Mining Technologies***
   - ***Biomedical Image Mining***
   - ***Knowledge Representation and Linguistic Tools***
     - Image Science Ontologies
     - Image Science Thesauri
4. ***Applied Problems***

Intended Audience

Professionals, researchers, PhD students and graduate students interested in Mathematical Theory of Image Analysis, in Problem Solving via modern mathematical techniques, designers of automated image analysis systems.

Prerequisites for Participants

- *Technical University course in mathematics including a course in general algebra;*
- *Technical University courses in pattern recognition and/or image analysis;*
- *Interest to theory and methodology of image analysis and to new mathematical techniques for pattern recognition and/or image analysis.*

Important Dates

Final Paper Submission: ***December 31, 2012***
Authors Notification: ***January 10, 2013***
Registration: ***January 20, 2013***

Workshop Program Committee
(preliminary version, to be extended)

Professor ***Sergey Ablameyko****, United Institute of Informatics Problems, National Academy of Sciences of Belarus, Belarus*
Professor Dr. ***Joachim Denzler****, Friedrich-Schiller University of Jena, Germany*
Professor Dr. ***Gennady Emelyanov****, Yaroslav-the-Wise Novgorod State University, Veliky Novgorod, Russian Federation*
Professor ***Heikki Kalviainen****, Lappeenranta University of Technology, Lappeenranta, Finland*
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Paper Submission

Prospective authors are invited to submit papers in any of the topics listed above. Instructions for preparing the manuscript (in Word and Latex formats) are available at the conference "Paper Templates" web page. Please also check the web page with the Submission Guidelines. Papers should be submitted electronically via the web-based submission system.

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All papers will be peer-reviewed. The criteria for accepting the papers will be as follows.
A paper would be accepted if it satisfies to any of the following conditions and corresponds to the subject matter of IMTA-4-2013 in a broad sense:
a) a reviewer likes it in general;
b) the author is a qualified person well known in the field;
c) a paper has a brand name - it came from a prominent scientific school, institution, university;
d) a paper includes a new idea, approach, etc., even without any practical confirmation;
e) a paper is devoted to an "interesting" application;
f) a paper is devoted to a new technique for an old application problem;
g) a paper is devoted to a new application for an old technique;
h) a paper is devoted to a problem or a topic important to the field.

Workshop Proceedings

All accepted papers will be published in the workshop proceedings book, under an ISBN reference, and in CD-ROM support. Full revised texts of all papers presented at the workshop will be published in the special issue of the international journal "Pattern Recognition and Image Analysis. Advances in Mathematical Theory and Applications" (MAIK "Nauka/Interperiodica" Pleiades Publishing, Moscow, distributed worldwide by SPRINGER), 2013.

Registration Information

At least one author of an accepted paper must register for the workshop. If the registration fees are not received by ***January 15, 2013*** *the paper will not be published in the workshop proceedings book.*

Contacts

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