

Lecture Notes in Artificial Intelligence 5108

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Petra Perner Ovidio Salvetti (Eds.)

Advances in Mass Data Analysis of Images and Signals in Medicine, Biotechnology, Chemistry and Food Industry

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Proceedings

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Preface

The automatic analysis of signals and images together with the characterization and elaboration of their representation features is still a challenging activity in many relevant scientific and hi-tech fields such as medicine, biotechnology, and chemistry. Multidimensional and multisource signal processing can generate a number of information patterns which can be useful to increase the knowledge of several domains for solving complex problems. Furthermore, advanced signal and image manipulation allows relating specific application problems into pattern recognition problems, often implying also the development of KDD and other computational intelligence procedures.

Nevertheless, the amount of data produced by sensors and equipments used in biomedicine, biotechnology and chemistry is usually quite huge and structured, thus strongly pushing the need of investigating advanced models and efficient computational algorithms for automating mass analysis procedures. Accordingly, signal and image understanding approaches able to generate automatically expected outputs become more and more essential, including novel conceptual approaches and system architectures.

The purpose of this third edition of the International Conference on Mass Data Analysis of Signals and Images in Medicine, Biotechnology, Chemistry and Food Industry (MDA 2008; www.mda-signals.de) was to present the broad and growing scientific evidence linking mass data analysis with challenging problems in medicine, biotechnology and chemistry. Scientific and engineering experts convened at the workshop to present the current understanding of image and signal processing and interpretation methods useful for facing various medical and biological problems and exploring the applicability and effectiveness of advanced techniques as solutions.

The primary goal of the conference was to disseminate this knowledge to a multidisciplinary community and encourage cooperative proactive collaboration in all the interested fields.

We were pleased to see that the idea of the conference was taken up by a growing number of researchers and that we could start to bundle the activities in this area.

We appreciate the help and understanding of the editorial staff at Springer, and in particular Alfred Hofmann, who supported the publication of these proceedings in the LNAI series.

Last, but not least, we wish to thank all the speakers and participants who contributed to the success of the conference.

The next International Conferences on Mass Data Analysis of Signals and Images (www.mda-signals.de) will be held in July 2009. We are looking forward to your submissions.

International Conferences on Mass Data Analysis of Signals and Images in Medicine, Biotechnology, Chemistry, and Food Industry, MDA 2008

July 14, 2008, Leipzig, Germany

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Aim of Conference

The automatic analysis of images and signals in medicine, biotechnology, and chemistry is a challenging and demanding field.

Signal-producing procedures by microscopes, spectrometers and other sensors have found their way into wide fields of medicine, biotechnology, economy and environmental analysis. With this arises the problem of the automatic mass analysis of

signal information. Signal-interpreting systems which generate automatically the desired target statements from the signals are therefore of compelling necessity. The continuation of mass analyses on the basis of the classical procedures leads to investments of proportions that are not feasible. New procedures and system architectures are therefore required.

Scope of Conference

The scope of the International Conference on Mass Data Analysis of Images and Signals in Medicine, Biotechnology, Chemistry and Food Industry (www.mda-signals.de) is to bring together researcher, practitioners and industry people who deal with mass analysis of images and signals to present and discuss recent research in these fields.

The goals of this workshop are to:

- Provide a forum for identifying important contributions and opportunities for research on mass data analysis on microscopic images
- Promote the systematic study of how to apply automatic image analysis and interpretation procedures to that field
- Show case applications of mass data analysis in biology, medicine, and chemistry

Topics

Topics of interest include (but are not limited to):

- Techniques and developments of signal and image producing procedures
- Object matching and object tracking in microscopic and video microscopic images
- 1D, 2D and 3D shape analysis and description
- 1D, 2D and 3D feature extraction of texture, structure and location
- Algorithms for 1D, 2D and 3D signal analysis and interpretation
- Image segmentation algorithms
- Parallelization of image analysis and interpretation algorithms
- Semantic tagging of images from life science applications
- Applications in medicine, biotechnology, chemistry and others
- Applications in crystallography
- Applications in proteomics
- Applications in 2D and 3D cell images analysis
- Image acquisition procedures for mass data analysis

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