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Editorial

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 hi-tech fields such as medicine, biotechnology, and chemistry. Multidimensional and multi-source signal processing can generate a multitude of information patterns that can be useful in increasing the knowledge of several domains for solving complex problems. Furthermore, by advanced signal and image manipulation it is possible to relate specific application problems to pattern recognition problems this often requires also the development of knowledge discovery and data mining methods and other computational intelligence procedures.

Nevertheless, the amount of data produced by sensors and equipment used in biomedicine, biotechnology and chemistry is usually quite huge and structured, thus creating a great need for investigating advanced models and efficient computational algorithms for automating mass analysis procedures. Accordingly, signal and image interpretation approaches that are able to generate automatically expected outputs become more and more essential; this includes also novel conceptual approaches and system architectures.

This issue contains selected papers from the annual International Conference on Mass Data Analysis of Signals and Images in Medicine, Biotechnology, Chemistry, and Food Industry, MDA (www.mda-signals.de).

The emphasis of this conference is laid on solutions for the automatic analysis and processing of mass data created recently in many processes in medicine, biotechnology, chemistry and food industry. The MDA conference deals with various new applications in these fields and the presentations demonstrate how such problems can be solved by recent developments in science. This issue encompasses presentations concerning all steps of an automatic signal/image analysis and interpretation system. Signal and image acquisition as well as topics for automatic image analysis and interpretation are discussed. Consequently, this issue is comprised of papers dealing with computer-assisted diagnosis for medical as well as biological problems, spectrometer signals interpretation in molecular biology, mining large scale molecular and biological data, signal acquisition and processing, and simulation in cellbiology.

The section computer-assisted diagnosis and image interpretation deals traditionally with medical problems such as heart beat rate determination, microscopic

cell image analysis, system evaluation as well as with problems relating to new topics such as systems biology and health monitoring by detecting biological hazardous material with the aid of image interpretation.

Mass spectrometer analysis to study protein markers is another hot topic in this issue. The authors apply geostatistics for analysing the spectrum.

Data Mining plays another important role in molecular data analysis and shape characterization of biological objects.

The specific signal acquisition requirement in the field of virology and the signal processing algorithm and the development of new models for Immune Mechanism Diagnosis are also presented in this issue.

In conclusion, this issue will give you an excellent overview of new hot topics relating to mass data signal and image analysis in medicine and biotechnology where new technologies have been employed to successfully solve the desired problems.

Petra Perner
Editor