

# Preface

This book contains the extended and revised versions of a set of selected papers from the 8th International Joint Conference on Biomedical Engineering Systems and Technologies (BIOSTEC 2015), held in Lisbon, Portugal, during March 12–15, 2015.

BIOSTEC was sponsored by the Institute for Systems and Technologies of Information, Control and Communication (INSTICC), held in cooperation with the ACM Special Interest Group on Bioinformatics, Computational Biology, and Biomedical Informatics (SIGBio), the ACM Special Interest Group on Artificial Intelligence (SIGAI), the ACM Special Interest Group (SIG) on Management Information Systems (MIS), EUROMICRO, the International Society for Telemedicine and eHealth (ISf-TeH), the Association for the Advancement of Artificial Intelligence (AAAI), and the European Association for Signal Processing (EURASIP); it was technically co-sponsored by the Biomedical Engineering Society (BMES), the European Society for Engineering and Medicine (ESEM), and the IEEE Engineering in Medicine and Biology Society (IEEE EMBS). INSTICC is member of the Workflow Management Coalition (WfMC), Object Management Group (OMG) and Foundation for Intelligent Physical Agents (FIPA). The BMC Medical Informatics and Decision Making was the media partner and the Science and Technology Events (SCITEVENTS) the logistics partner.

The hallmark of this conference is to provide a point of contact for researchers and practitioners interested in both theoretical advances and applications of information systems, artificial intelligence, signal processing, electronics, and other engineering tools in knowledge areas related to biology and medicine.

BIOSTEC is composed of five complementary and co-located conferences, each specialized in at least one of the aforementioned main knowledge areas; namely:

- BIODEVICES - International Conference on Biomedical Electronics and Devices
- BIOIMAGING - International Conference on Bioimaging
- BIOINFORMATICS - International Conference on Bioinformatics Models, Methods and Algorithms
- BIOSIGNALS - International Conference on Bio-inspired Systems and Signal Processing
- HEALTHINF - International Conference on Health Informatics

The purpose of the International Conference on Biomedical Electronics and Devices (BIODEVICES) is to bring together professionals from electronics and mechanical engineering, interested in studying and using models, equipment, and materials inspired from biological systems and/or addressing biological requirements. Monitoring devices, instrumentation sensors and systems, biorobotics, micro-nanotechnologies, and biomaterials are some of the technologies addressed at this conference.

The aim of the International Conference on Bioimaging (BIOIMAGING) is to get together experts and to foster discussion on acquisition, processing, and visualization of

image information in the context of medicine and biology. This multifaceted field covers many available image modalities, such as X-ray, computed tomography (CT), magnetic resonance imaging (MRI), and so on. The image acquisition and processing techniques are used to create images of the human body, anatomical areas, tissues, and so on, down to the molecular level, either for clinical purposes, seeking to reveal, diagnose, or examine diseases, or for medical science, including the study of normal anatomy and physiology.

The authors are encouraged to submit papers describing methods, techniques, advanced prototypes, applications, systems, tools, or survey papers. The International Conference on Bioinformatics Models, Methods and Algorithms (BIOINFORMATICS) intends to provide a forum for discussion to researchers and practitioners interested in the application of computational systems and information technologies to the field of molecular biology, including, for example, the use of statistics and algorithms in understanding biological processes and systems, with a focus on new developments in genome bioinformatics and computational biology. Areas of interest for this community include sequence analysis, biostatistics, image analysis, scientific data management and data mining, machine learning, pattern recognition, computational evolutionary biology, computational genomics, and other related fields.

The goal of the International Conference on Bio-inspired Systems and Signal Processing (BIOSIGNALS) is to bring together researchers and practitioners from multiple areas of knowledge, including biology, medicine, engineering, and other physical sciences, interested in studying and using models and techniques inspired from or applied to biological systems. A diversity of signal types can be found in this area, including image, audio, and other biological sources of information. The analysis and use of these signals is a multidisciplinary area including signal processing, pattern recognition, and computational intelligence techniques, among others.

The International Conference on Health Informatics (HEALTHINF) aims to be a major meeting point for those interested in understanding the human and social implications of technology, not only in health-care systems but in other aspects of human-machine interaction such as accessibility issues and the specialized support to persons with special needs.

The eighth edition of the joint conference BIOSTEC received 375 paper submissions from 62 countries. From these, 61 papers were published as full papers, 92 were accepted for short presentation, and another 73 for poster presentation. These numbers, leading to a “full-paper” acceptance ratio of about 16 % and an oral paper acceptance ratio close to 41 %, show the intention of preserving a high quality forum for the next editions of this conference.

We sincerely thank the authors, whose research and development efforts are recorded here.

September 2015

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Biomedical Engineering Systems and Technologies  
8th International Joint Conference, BIOSTEC 2015,  
Lisbon, Portugal, January 12-15, 2015, Revised Selected  
Papers

Fred, A.; Gamboa, H.; Elias, D. (Eds.)

2015, XXV, 474 p. 223 illus. in color., Softcover

ISBN: 978-3-319-27706-6