

Welcome Address

Dear colleagues and students,

On behalf of the Organizing Committee, we would like to cordially invite you to the 12th International Conference on Bioinformatics and BioEngineering (BIBE 2012).

The annual IEEE International Conference on Bioinformatics and Bioengineering cover complementary disciplines that hold great promise for the advancement of research and development in complex medical and biological systems, agriculture, environment, public health, drug design, and so on. Research and development in these two areas are impacting the science and technology of fields such as medicine, food production, forensics, etc. by advancing fundamental concepts in molecular biology and in medicine, by helping us understand living organisms at multiple levels, by developing innovative implants and bio-prosthetics, and by improving tools and techniques for the detection, prevention and treatment of diseases. The BIBE series provides a common platform for the cross fertilization of ideas, and to help shape knowledge and scientific achievements by bridging these two very important and complementary disciplines into an interactive and attractive forum.

The event is organized and sponsored by IEEE, the IEEE Computer Society, the University of Cyprus and the Biological & AI Foundation (BAIF), co-organized and co-sponsored by the Frederick University, Cyprus, the Hellenic Society for Computational Biology and Bioinformatics (HSCBB), and the Technical University of Cyprus, Cyprus. BIBE 2012 is technically co-sponsored by the IEEE Engineering in Medicine and Biology Society (IEEE EMBS) and the International Federation for Medical and Biological Engineering (IFMBE). It is supported by the IEEE EMBS Cyprus Chapter, the IEEE CIS Cyprus Chapter, the IEEE Cyprus Section, the Cyprus Society of Medical Informatics, and the Cyprus Association of Medical Physics and Biomedical Engineering. Additional support was also given by the Cyprus Tourism Organization.

BIBE 2012 marks the continuation of the previous 11 successful conferences held in Washington DC in 2000, in Bethesda in 2001, in Bethesda 2003, in Taichung in 2004, in Minneapolis in 2005, in Washington DC in 2006, in Boston in 2007, in Athens in 2008, in Taichung in 2009, in Philadelphia in 2010 and in Taichung in 2011.

A total of 134 papers authored by 460 scientists, engineers, and physicians will be presented under the *Bioinformatics Track* (31 papers), the *BioEngineering Track* (86 papers), and the *Special Session on Computational Solutions to Large-scale Data Management and Analysis in Translational and Personalized Medicine* (17 papers). The sessions under the *Bioinformatics Track* are the following: *Databases Integration - Interoperability - Visualization & Data Mining*, *Biomolecular Sequence Analysis*, *Biomolecular Structure Analysis*, *Functional Genomics & Proteomics*, *Systems Biology*, and *Algorithms and Systems in Bioinformatics*. The sessions under the *BioEngineering Track* are the following: *eHealth*, *ECG*, *Intelligent Systems*, *ECG & Biosignal Analysis*, *Intervention & Therapeutic Systems*, *EEG & Biosignal Analysis*, *Sensing & Processing*, *Biosignal Processing & Analysis*, *Segmentation & Texture Analysis*, *Image Registration & Microscopy Imaging*, *Image Analysis 1* and *Image Analysis 2*. The sessions under the *Special Session on Personalized Medicine* are the following: *Frameworks for Large-scale Data Sharing*, *Semantics and Related Sociotechnical Issues*, *Algorithms for Marker Selection*, *Diagnosis*, *Prognosis and Patient Empowerment*, and *Modeling and Analysis Frameworks*. Also, 10 papers were selected to compete for the student's paper competition.

Extended versions of the best papers of the conference will be invited for publication in journal special issues of the *IEEE Journal of Biomedical and Health Informatics (J-BHI)*, the *International Journal on Artificial Intelligence Tools (IJAIT)*, and the *International Journal of Monitoring and Surveillance Technologies Research (IJMSTR)*.

We would like to thank all the track chairs and reviewers who put a great deal of time and effort, under very tight deadlines during summer time, in order to help us review all the papers and put the program together.

The program features five keynote presentations from distinguished colleagues. The first keynote will be given by Prof. Metin Akay, Founding Chair, John S Dunn Endowed Chair Professor, Department of Biomedical Engineering, Cullen College of Engineering, University of Houston, Houston, TX, USA, on "*The Effects of Nicotine Exposure on the Complexity and the Genetic Patterns of Dopamine Neurons in VTA*". The second keynote will be given by Prof. Yuan-Ting Zhang, Director of Joint Research Center for BME at EE-CUHK, Hong Kong, China and Director of the Key Lab for Health Informatics of Chinese Academy of Sciences (HICAS) at SIAT, Shenzhen, China, on "*From 6-Ps Medicine to Cardiovascular Health Informatics*". The third keynote will be given by Prof. Konstantina S. Nikita, Professor and Deputy Head of Faculty of Electrical Engineering at the N.T.U.A., Athens, Greece, on "*Computer-Aided Interpretation of Vascular Images towards Valid Diagnosis and Risk Stratification of Atherosclerosis*". The fourth keynote, will be given by Prof. Miguel Andrade, Group Leader of the Computational Biology and Data Mining group, Max Delbrück Center for Molecular Medicine, Berlin, Germany Affiliate investigator at the Ottawa Hospital Research Institute, Canada, on "*Turning data into predictions of gene and protein function*" and the fifth keynote will be given by Prof. Christos Ouzounis, Principal Investigator at the Centre for Research & Technology Hellas (CERTH), Thessalonica, Greece, and a visiting Professor at The Terrence Donnelly Centre for Cellular & Biomolecular Research (CCBR), University of Toronto, Canada, on "*From reading to writing (and rewriting) the code of life: the future of biology – scientific, ethical, legal, civil and social issues*".

This year's BIBE is held in the sunny island of Cyprus, an island with a huge recorded history and cultural heritage. We hope that you will find time to explore the island.

On behalf of the Organizing Committee, we would like to wish you all a very stimulating and exciting Conference.

Constantinos S. Pattichis, *General Chair*
University of Cyprus, Cyprus

Efthymoulos C. Kyriacou, *Program Co-Chair*
Frederick University, Cyprus

Vasilis J. Promponas, *Program Co-Chair*
University of Cyprus, Cyprus

**Nikolaos Bourbakis, *BIBE Founding
Steering Committee Chair***

Reinhard Schneider, *General Co-Chair*
University of Luxembourg, Luxembourg

Miguel Andrade, *Program Co-Chair*
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