

# **CALL FOR PAPERS - Special Session On Computational Biostatistics For Data Integration In Systems Biomedicine**

Part of the CIBB 2014 - 11th International Meeting on Computational Intelligence Methods for Bioinformatics and Biostatistics

Computer Laboratory, University of Cambridge, Cambridge, United Kingdom

June 26-28 2014

<http://www.cussb.univr.it/cibb2014/>

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## **AIMS AND SCOPE**

Current biomedical research is facing the systems challenge involving the use of dedicated mathematical, bioinformatic and biostatistical tools. These are necessary to address the key issues of integrating data collected across multiple sources, the dynamics of disease processes, risk factors and biomarkers related to diagnosis, prognosis and response to treatments, as well as their modulation by genetic, epigenetic, lifestyle determinants, and environmental influences.

The recent workshop Clinical Needs in Oncology and Cardiovascular Diseases, as drivers for a Systems Medicine approach of the EU Coordinating Action System Medicine CASyM in Genua for the Clinical Oncology round table, pointed out the following issues:

The existence of paradigm shift towards integrative (cross-disciplinary Systems Medicine). Systems Medicine consortia should implement “collective” rather than individualistic ways of working. There is an unmet need for understanding the biological complexity of cancer. An interdisciplinary approach is needed for reaching successful, long-term goals. Involvement and education of the general public must be stressed. To face these issues data integration is considered the top priority.

The aim of this special session is to bring together researchers interested in the development of Computational Biostatistics methods to address the applied and methodological challenges posed by the data integration problem in System Biomedicine. Relevant topics within this context include the development and application of methods for Survival Data Analysis with Omic data, Diagnosis and Prognostic tools on complex Biomarkers as well as experimental design and data analysis approaches for Pharmacogenomics and response to Polytherapies.

## **IMPORTANT DATES**

Paper submission deadline:	April 28, 2014 (*)
Notification of Acceptance:	May 10, 2014
Final papers due:	May 30, 2014 (**)
Conference:	June 26-28, 2014

(\*) contact the session organisers for late submission

(\*\*) for the inclusion in the CIBB14 conference proceeding

## **SUBMISSIONS**

Conference papers must be prepared following the [guidelines illustrated on CIBB website](#).

**Correct submissions require selecting this special session in the submission system.**

Each paper will be peer-reviewed and the resulting scores used to determine invitations for oral or poster presentations.

## **ABOUT THE ORGANISERS**

**PROF. ELIA BIGANZOLI.** University Of Milan, Italy.

Elia Mario Biganzoli. Professor in Medical Statistics at the Faculty of Medicine of the University of Milan and Senior Biostatistician, Unit of Medical Statistics, Biometry and Bioinformatics, Fondazione IRCCS Istituto Nazionale dei Tumori, Task Force Leader Evaluation & Benchmarking, BIOPATTERN Network of Excellence FP6 project:" Computational Intelligence for Biopattern Analysis in Support of eHealthcare". Cofounder of the IEEE Neural Network Society Special Interest Group Biopattern.

He was responsible and participated to national and international projects with Associazione Italiana per la Ricerca sul Cancro, National Research Council-Polish Academy of Sciences, Italian Ministry of Health, Italian Ministry of the University and Research, European Commission. His main research fields concern statistical methods for survival analysis and biological assay development. He participated in the planning of diagnostic and prognostic studies in cancer, cardiovascular diseases, rheumatology, hematology and the analysis of their results with special interest on molecular biomarkers and bioprofiles. He developed statistical approaches for the extension of generalized linear models with artificial neural networks and splines for the flexible analysis of censored survival data. His main research focus with his group was to join biostatistics with biomedical informatics through multivariate analysis and pattern recognition approaches in oncology.

**PROF. PAULO LISBOA.** Liverpool John Moore University. UK.

Professor in Industrial Mathematics in the School of Computing and Mathematical Sciences at Liverpool John Moores University and Research Professor at St Helens & Knowsley Teaching Hospitals. His research is focused on computer-based decision support in healthcare and data analytics in public health, sports science and computational marketing. In particular he has an interest in principled approaches to interpretable modelling of non-linear data and processes.

He is in the Horizon2020 Advisory Group for Societal Challenge Health, Demographic Change & Wellbeing an expert evaluator for the European Community DG-INFSO, and in the EPSRC Peer Review College. He has over 250 refereed publications with awards for citations, chairs the Medical Data Analysis Task Force in the Data Mining Technical Committee of the IEEE-CIS and is Associate Editor for IET Science Measurement and Technology, Neural Computing Applications, Applied Soft Computing and Source Code for Biology and Medicine.

Paulo Lisboa studied mathematical physics at Liverpool University where he took a PhD in theoretical physics in 1983. His research is focused on computer-based decision support in healthcare, extending also to the analysis of public health data for policy reporting and commissioning purposes and computational data analysis in sports science and computational marketing. In particular he has made significant developments in source identification in Magnetic Resonance Spectroscopy, flexible models for hazard estimation following surgery for breast cancer and principled approaches to retrieval-based classification using information geometry.

**PROF. JON GARIBALDI.** University of Nottingham, UK.

Professor of Computer Science School of Computer Science, University of Nottingham.

### **Employment History**

University of Nottingham; 1st Aug 2002 to Date

Lecturer / Senior Lecturer; De Montfort University, Leicester; 01/09/99 - 31/07/02

Research Assistant / Fellow; University of Plymouth; 01/05/92 - 31/08/99

C/Unix Consultant; Self-employed; 01/10/91 – 30/04/92

Analyst/Programmer; DuPont-Howsons, Leeds; 01/10/89 – 30/09/90

Senior Programmer; Barrs Court Computer Systems, Bristol; 01/01/86 – 30/09/89

Programmer; Self-employed; 01/07/84 – 31/12/85

### **Qualifications**

1997 Ph.D. “Intelligent Techniques for Handling Uncertainty in the Assessment of Neonatal Outcome”, University of Plymouth

1991 M.Sc. “Intelligent Systems”, University of Plymouth

1984 B.Sc. Hons. Physics, University of Bristol

### **Research Overview**

My main research interest is in the development of artificial intelligence techniques for data modelling and analysis, biomedical decision support and in the modelling of human decision making. I also research generic machine learning topics of data clustering and classification, particularly when dealing with uncertain and complex data, and optimisation. These interests have been applied in areas such as the assessment of complex multi-modal datasets in breast cancer prognosis and diagnosis of Alzheimer's disease, the early detection of cancer through analysis of FTIR spectra, and parameter optimisation in systems biology models.

### **Research Leadership**

Director of the University's Advanced Data Analysis Centre (ADAC).

**PROF. LEIF PETERSON.** The Methodist Hospital Research Institute, Houston TX.

**Leif E. Peterson.** Associate Professor of Public Health, Weill Cornell Medical College (Cornell University), and Director of the Center for Biostatistics, Houston Methodist Research Institute, Adjunct Associate Professor of Medicine, Dept. of Medicine, Baylor College of Medicine, Adjunct Associate Professor of Biostatistics, Division of Biostatistics, University of Texas, School of Public Health and Adjunct Associate Professor, Department of Neuroscience & Experimental Therapeutics, Texas A & M University. Dr. Peterson is a member of IEEE-CIS Computational Intelligence Society - Institute of Electrical and Electronics Engineers, IEEE-CIS Bioinformatics and Bioengineering Technical Committee (BBTC), and IEEE-CIS-BBTC-Task Force on Neural Networks (TFNN). Dr. Peterson has over 25 years of experience in biostatistical study design and analysis, bioinformatics, genomic classification, transcriptomics and proteomics, cancer statistics, software development for machine learning and computational intelligence. He has published more than 90 peer-reviewed papers and has published numerous US Government reports. Dr. Peterson's research focuses on data integrative systems biology approaches to develop biologically-motivated models of risk mitigation for space radiation-induced cancer and CNS effects, novel techniques for optimization based on neural adaptive learning with metaheuristics (neural networks, genetic algorithms, swarm intelligence, evolution strategies), information retrieval using duo-mining (data and text), n-grams, and non-linear and linear dimensional reduction with manifold learning, eigendecomposition, random matrix theory, and Monte Carlo simulation for uncertainty analyses.