

# **GSP 2011**

**2<sup>nd</sup> International Workshop on Genomic Signal Processing**

**June 26-29, 2011**

**PROGRAMME**



# **International Workshop on Genomic Signal Processing**

The main purpose of the workshop is to offer the opportunity of bringing together specialists from biology, medicine, various fields of engineering, mathematics and computer science, interested in genomic signal processing, functional genomics and system biology.

## **ORGANIZERS**

**GSP2011** is organized by the University "Politehnica" of Bucharest – Faculty of Electrical Engineering, Faculty of Engineering in Foreign Languages and the Biomedical Engineering Center, with the support of the Romanian Ministry of Education, Research, Youth and Sports and the IEEE Romania Section, as well as with the technical co-sponsorship of the Romanian Academy – the Section of Technical Sciences and the Biomedical Engineering Commission, EMBS – the IEEE Society of Engineering in Medicine and Biology and of the Romanian Society of Bioinformatics.

## **HONORARY CHAIR**

Ecaterina ANDRONESCU, University “Politehnica” of Bucharest (Romania), Rector.

## **CONFERENCE CO-CHAIRS**

Paul CRISTEA, University “Politehnica” of Bucharest, Romania  
Sanjit MITRA, University of California at Santa Barbara, USA

## **INTERNATIONAL SCIENTIFIC COMMITTEE**

Ecaterina Andronescu, University “Politehnica” of Bucharest, Romania  
Jaakko Astola, Tampere University of Technology, Finland  
Anastasios Bezerianos, University of Patras, Greece  
Corneliu Burileanu, University “Politehnica” of Bucharest, Romania  
Jean Ciurea, “Bagdasar Arseni” Emergency Clinic Hospital, Bucharest, Romania  
Jan Cornelis, Vrije University of Brussel, Belgium  
Gleb Dragan, Romanian Academy, Bucharest, Romania  
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Liviu Goras, Technical University “Gheorghe Asachi”, Iași, Romania  
Mislav Grgic, University of Zagreb, Croatia  
C.-C. Jay Kuo, University of Southern California, USA  
Solomon Marcus, Institute of Mathematics of the Romanian Academy, Bucharest, Romania  
Valeri Mladenov, Technical University of Sofia, Bulgaria  
Sergey Petoukhov, Russian Academy of Sciences, Moscow, Russia  
Erchin Serpedin, Texas A&M University, USA  
Victor Sontea, Technical University of Moldova, Chișinău, Moldova  
Ioan Tăbuș, Tampere University of Technology, Finland  
Nicolae Țăpuș, University “Politehnica” of Bucharest, Romania  
Horia-Nicolai Teodorescu, Technical University “Gheorghe Asachi”, Iași, Romania  
Byung-Jun Yoon, Texas A&M University, USA

## **LOCAL ORGANIZING COMMITTEE**

Rodica Tuduce, University “Politehnica” of Bucharest, Romania  
Bujor Păvăloiu, University “Politehnica” of Bucharest, Romania  
Magnolia Costache, University “Politehnica” of Bucharest, Romania

## TIMETABLE AT A GLANCE

### Sunday, June 26, 2011

20:00– 22:00 Get together cocktail

### Monday, June 27, 2011

9:00 – 9:30 Opening  
9:30 – 10:15 Lecture 1 - Asoke NANDI  
10:15 – 11:00 Lecture 2 - C.-C. Jay KUO  
11:00 – 11:30 Coffee break  
11:30 – 12:15 Lecture 3 - Paul Dan CRISTEA  
12:15 – 13:00 Lecture 4 - Erchin SERPEDIN  
13:00 – 14:30 Lunch  
14:30 – 15:15 Lecture 5 - Sergey V. PETOUKHOV  
15:15 – 16:00 Lecture 6 - Anastasios BEZERIANOS  
16:00 – 16:30 Coffee break  
16:30 – 19:10 Conference session  
20:00 – 22:00 Dinner - "Caru cu Bere" (Beer Cart)

### Tuesday, June 28, 2011

8:30 – 9:15 Lecture 7 - Jaakko T. ASTOLA  
9:15 – 10:00 Lecture 8 - Ioan TABUS  
10:00 – 10:30 Coffee break  
10:30 – 11:15 Lecture 9 - Rodica TUDUCE  
11:15 – 12:00 Lecture 10 - Constantin IONESCU-TÎRGOVISTE  
12:00 – 13:30 Lunch  
13:30 – 14:15 Lecture 11 - Oana CRAMARIUC  
14:15 – 15:00 Lecture 12 - Branimir RELJIN  
15:00 – 15:30 Coffee break  
15:30 – 18:30 Conference session  
19:00 – 22:00 Dinner - "Pui de Urs" (Bear Cub)

# PROGRAMME

Monday, 27 June 2011

**Place:** University Senate Room

9:00-9:30      **Opening Ceremony**

**Chair:** Sergey Petoukhov, Russian Academy of Sciences, Moscow, Russia

**Time:** 9:00 to 11:00 , June 27, Monday

**Place:** University Senate Room

**Presentation Type:** **Lectures**

9:30 – 10:15      **Lecture 1**  
**Invited paper**  
**Comparisons of Validation Criteria for Clustering Algorithms in Microarray Gene Expression Data Analysis**  
Rui FA and Asoke NANDI

10:15 – 11:00      **Lecture 2**  
**Invited paper**  
**MetaSEQ: De Novo Sequence Assembly of Short Regions in Metagenomics**  
Sungje CHO, C.-C. Jay KUO, Fellow, IEEE, and Ting CHEN

**Place:** University Rectorate Hall (2<sup>th</sup> floor)

11:00-11:30      **Coffee Break**

**Chair:** C.-C. Jay Kuo, University of Southern California, USA

**Time:** 11:30 to 13:00 , June 27, Monday

**Place:** University Senate Room

**Presentation Type:** **Lectures**

11:30 – 12:15      **Lecture 3**  
**Invited paper**  
**Nucleotide Genomic Signals**  
Paul Dan CRISTEA

12:15 – 13:00      **Lecture 4**  
**Invited paper**  
**Some Applications of Maximum Likelihood Approach to Genomic Signal Processing**  
Bilal WAJID and Erchin SERPEDIN

**Place:** University Restaurant (5<sup>th</sup> floor)

13:00 – 14:30      **Lunch**

**Chair:** Ioan Tăbuș, Tampere University of Technology, Finland

**Time:** 14:30 to 16:00, June 27, Monday

**Place:** University Senate Room

**Presentation Type:** **Lectures**

14:30 – 15:15      **Lecture 5**  
**Invited paper**  
**Matrix Genetics, 8-Dimensional Hypercomplex Numbers and Dyadic Shifts**  
Sergey V. PETOUKHOV

15:15 – 16:00      **Lecture 6**  
**Invited paper**  
**An Integrated Method for Detecting Overlapping Functional Modules on Protein Networks**  
Konstantina DIMITRAKOPOULOU and Anastasios BEZERIANOS

**Place:** University Rectorate Hall (2<sup>th</sup> floor)

16:00 – 16:30      **Coffee Break**

**Chair:** Rodica Tuduce, University "Politehnica" of Bucharest, Romania

**Time:** 16:30 to 19:10, June 27, Monday

**Place:** University Senate Room

**Presentation Type:** **Conference session**

16:30 – 16:50	<b>Exploring Minimum Description Length and Probabilistic Distributions of the Reference Sequences for Comparative Assembly of Genomes</b> Bilal WAJID, Rodolfo ARAMAYOAND and Erchin SERPEDIN
16:50 – 17:10	<b>Investigations on Genomic Coding Sequences using Multifractal Analysis</b> C. STAN, T. MINEA, T. M. CRISTESCU, L. BUIMAGA-IARINCA, V. MORARIU and C. P. CRISTESCU
17:10 – 17:30	<b>Modeling Gene Regulatory Network from Time Series Data using Particle Filtering</b> Amina NOOR and Erchin SERPEDIN
17:30 – 17:50	<b>Phase-Based Neural Networks</b> Ionel-Bujorel PAVALOIU and Paul Dan CRISTEA
17:50 – 18:10	<b>Stochastic Modeling of the Computational Logic in Gene Transcription</b> Fang-Han HSU and Erchin SERPEDIN
18:10 – 18:30	<b>Specific aspects on the prediction of DNA sequences</b> Dumitru Iulian NASTAC and Paul Dan CRISTEA
18:30 – 18:50	<b>Application of Neural networks for DNA sequence prediction</b> Valeri MLADENOV and Georgi TSENOV
18:50 – 19:10	<b>Applications of the Event Synchronous Cancellation method on biopotentials</b> D. TARALUNGA, Mihaela UNGUREANU, Rodica STRUNGARU

**Place:** "Caru cu Bere" (Beer Cart) - Str. Stavropoleos, Nr. 3-5, Phone 021 313 7560

20:00 – 22:00 **Dinner**

## Tuesday, 28 June 2011

**Chair:** Prof. Anastasios BEZERIANOS, University of Patras, Greece

**Time:** 8:30 to 10:00, June 28, Tuesday

**Place:** University Senate Room

**Presentation Type:** **Lectures**

8:30 – 9:15	<b>Lecture 7</b> <b>Invited paper</b> <b>Regular, Efficient and Robust Representations of Discrete Functions</b> Jaakko T. ASTOLA
9:15 – 10:00	<b>Lecture 8</b> <b>Invited paper</b> <b>Sequence alignment and clustering based on MDL and normalized maximum likelihood models</b> Ioan TABUS and Jaakko ASTOLA

**Place:** University Rectorate Hall (2<sup>th</sup> floor)

10:00 – 10:30 **Coffee Break**

**Chair:** Jean Ciurea, "Bagdasar Arseni" Emergency Clinic Hospital, Bucharest, Romania

**Time:** 10:30 to 12:00, June 28, Tuesday

**Place:** University Senate Room

**Presentation Type:** **Lectures**

10:30 – 11:15	<b>Lecture 9</b> <b>Invited paper</b> <b>Hominidae mtDNA Analysis by Using Nucleotide Genomic Signals</b> Paul Dan CRISTEA and Rodica TUDUCE
11:15 – 12:00	<b>Lecture 10</b> <b>Invited paper</b> <b>Predisposing and protective genetic factors in type 1 diabetes</b> Cristian GUJA and Constantin IONESCU-TÎRGOVISTE

**Place:** University Restaurant (5<sup>th</sup> floor)

12:00 – 13:30 **Lunch**

**Chair:** Constantin IONESCU-TIRGOVISTE, Inst. of Diabetes, Nutrition and Metabolic Diseases "N. C. Paulescu", Romania

**Time:** 13:30 to 15:00 , June 28, Tuesday

**Place:** University Senate Room

**Presentation Type:** **Lectures**

13:30 – 14:15 **Lecture 11**  
**Invited paper**  
**Approaches to Linking Biomolecular Simulations and Computational Systems Biology**  
Oana CRAMARIUC and Bogdan CRAMARIUC

14:15 – 15:00 **Lecture 12**  
**Invited paper**  
**Computer-aided evaluation of malignancy from UV/VIS spectra of pleural effusions**  
Branimir RELJIN, Irini RELJIN, Milka AVRAMOV-IVIC, Goran PLAVEC and Slobodan PETROVIC

**Place:** University Rectorate Hall (2<sup>th</sup> floor)

15:00 – 15:30 **Coffee Break**

**Chair:** Bujor Păvăloiu, University "Politehnica" of Bucharest, Romania

**Time:** 15:30 to 18:30 , June 28, Tuesday

**Place:** University Senate Room

**Presentation Type:** **Conference session**

15:30 – 15:50 **Protein Surface Hydrophobicity and Charge Analysis**  
Paul Dan CRISTEA, Octavian ARSENE, Rodica TUDUCE and Dan V. NICOLAU

16:50 – 16:10 **Dynamic block allocation for DNA sequences**  
Paul GAGNIUC, Paul Dan CRISTEA, Rodica TUDUCE, C.IONESCU-TIRGOVISTE, Liliana BURLIBASA, D. CIMPONERIU and Lucian GAVRILA

16:10 – 16:30 **Smart predictive model for air pollutants**  
Dumitru Iulian NASTAC, Nicoleta TANASE, and Paul Dan CRISTEA

16:30 – 16:50 **Practical implementation for reading genomic signals from large FASTA files**  
Paul GAGNIUC, Paul Dan CRISTEA, Rodica TUDUCE, C. IONESCU-TIRGOVISTE, Liliana BURLIBASA, D. CIMPONERIU and Lucian GAVRILA

16:50 – 17:10 **Iris Color Classification using Mean Shift Procedure**  
Adrian LODIN and Corneliu RUSU

17:10 – 17:30 **Automatic growth detection of cell cultures through outlier techniques**  
Paul GAGNIUC, Paul Dan CRISTEA, Rodica TUDUCE, C. IONESCU-TIRGOVISTE, Liliana BURLIBASA, D. CIMPONERIU and Lucian GAVRILA

17:30 – 17:50 **Rhythmogram – method of study for cardiac rhythm variability (CRV) at sportsmen with extreme sinus bradycardia**  
Matei TEODORESCU and Daniela TEODORESCU

17:50 – 18:10 **Improved Model of the Baroreceptor Reflex for Blood Pressure Regulation in Post Cardiac Surgery Patients,**  
Ciprian SANDU

18:10 – 18:30 **On Fast Neuromodulation**  
Jean CIUREA

**Place:** "Pui de Urs" (Bear Cub), Strada Economu Cezarescu Nr 42, Phone: 021.3166289

19:00 – 22:00 **Dinner**