

# **2012 IEEE 12th International Conference on Bioinformatics & Bioengineering**

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## Technical Program



*Cylindrical copper cases for medicines, Pafos Museum*

**Edited by:**

Efthymoulos Kyriacou

Vasilis Promponas

Christos Loizou

Christos N. Schizas

Constantinos S. Pattichis

Sunday Afternoon, 11<sup>th</sup> November

**Session:** eHealth

**Time & Place:** 13:00-14:45 – Les Etoiles

**Chairpersons:** Ilias Maglogiannis, *Department of Computer Science and Biomedical Informatics, University of Central Greece, Greece*  
Nicolas Stylianides, *Department of Computer Science, University of Cyprus, Cyprus*

**Sun. 1.1**

**13:00-13:15**

**Intensive Care Cloud** \*\*

Nicolas Stylianides<sup>1</sup>, Harald Gjermundrod<sup>2</sup>, Marios Dikaiakos<sup>1</sup> and Theodoros Kyprianou<sup>3</sup>

<sup>1</sup>*Department of Computer Science, University of Cyprus, Nicosia, Cyprus;* <sup>2</sup>*Department of Computer Science, University of Nicosia, Nicosia, Cyprus;* <sup>3</sup>*St. George's Medical School University of Nicosia, Nicosia, Cyprus*

**Sun. 1.2**

**13:15-13:30**

**A Collaborative Wiki-based Tool for Semantic Management of Medical Interventions** \*\*

Dionysia Kontotasiou<sup>1</sup>, Charalabos Bratsas<sup>2</sup> and Panagiotis Bamidis<sup>2</sup>

<sup>1</sup>*Information Technologies Institute (ITI), Centre of Research and Technology Hellas (CERTH), Thessaloniki, Greece;* <sup>2</sup>*Medical Informatics Laboratory, School of Medicine, Aristotle University of Thessaloniki, Thessaloniki, Greece*

**Sun. 1.3**

**13:30-13:45**

**A Method to Summarize Disease Based Temporal State of Human Organ using Laboratory Test Data and UMLS Knowledge** \*\*\*

Soubhik Paul, Raj Roy, Swarupananda Bissoyi, Sandip Bhaumik, Meru Patil and Vivekeshwar Bhardwaj  
*Samsung India Software Operation, Bangalore, India*

**Sun. 1.4**

**13:45-14:00**

**Medical Guidelines Reconciling Medical Software and Electronic Devices: Imatinib Case-study** \*\*

Alena Simalatsar and Giovanni De Micheli

*Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland*

**Sun. 1.5**

**14:00-14:15**

**Enabling Data Protection through PKI encryption in IoT m-Health Devices** "

Charalampos Doukas<sup>1</sup>, Ilias Maglogiannis<sup>2</sup>, Vasiliki Koufi<sup>3</sup>, Flora Malamateniou<sup>3</sup> and George Vassilacopoulos<sup>3</sup>

<sup>1</sup>*Department of Information and Communication Systems Engineering, University of Aegean;* <sup>2</sup>*Department of Computer Science and Biomedical Informatics, University of Central Greece;* <sup>3</sup>*Department of Digital Systems, University of Piraeus, Greece*

**Sun. 1.6**

**14:15-14:30**

**Electronic Health Record Diagnosis tool and a cross reference between coding standards** "

Harris Soteriades<sup>1</sup>, Kleanthis Neokleous<sup>1</sup>, George Tsouloupas<sup>2</sup>, Antonis Jossif<sup>3</sup> and Christos Schizas<sup>4</sup>

<sup>1</sup>*Department of Computer Science, University of Cyprus, Nicosia, Cyprus;* <sup>2</sup>*The Cyprus Society for Medical Informatics, Nicosia, Cyprus;* <sup>3</sup>*"Paedi" Center for Specialized Pediatrics, Nicosia, Cyprus;* <sup>4</sup>*Department of Computer Science, University of Cyprus, Nicosia, Cyprus*

**Sun. 1.7**

**14:30-14:45**

**MammoApplet: an interactive Java applet tool for manual annotation in medical imaging** "

Christian Mata, Arnau Oliver, Albert Torrent, Joan Martí

*Computer Vision and Robotics Group, University of Girona, Girona, Spain*

**Coffee Break**

**14:45-15:15**

Sunday Afternoon, 11<sup>th</sup> November

**Session:** Databases: Integration, Interoperability, Visualization, and Data Mining

**Time & Place:** 13:00-14:45 – Minerva

**Chairpersons:** Ioan Lucian Muntean, *Computer Science Department, Technical University of Cluj-Napoca, Romania*  
Manolis Christodoulakis, *Department of Electrical and Computer Engineering, University of Cyprus, Cyprus*

**Sun. 2.1** **13:00-13:15**

**Mining disease integrated ontology**

Taysir Soliman<sup>1</sup>, Marwa Hussein<sup>1</sup> and Mohamed El-Sharkawi<sup>2</sup>

<sup>1</sup>Information Systems Department, Faculty of Computers & Information, Assiut University, Egypt; <sup>2</sup>Information Systems Department, Faculty of Computers & Information, Cairo University, Egypt

**Sun. 2.2** **13:15-13:30**

**Method of extracting sentences about protein interaction from the literature on protein structure analysis using selective transfer learning**

Shun Koyabu, Riku Kyougoku and Takenao Ohkawa

*Graduate School of System Informatics, Kobe University, Rokkodai, Nada, Kobe, Japan*

**Sun. 2.3** **13:30-13:45**

**Visualizing High Dimensional Datasets Using Parallel Coordinates: Application to Gene Prioritization**

Thomas Boogaerts, Leon-Charles Tranchevent, Georgios A. Pavlopoulos, Jan Aerts and Joos Vandewalle

*ESAT-SCD-SISTA / IBBT-K.U.Leuven Future Health Department, Katholieke Universiteit Leuven, Leuven, Belgium*

**Sun. 2.4** **13:45-14:00**

**GIDT - A Tool for the Identification and Visualization of Genomic Islands in Prokaryotic Organisms**

Haswanee Goodur, Vyasanand Ramtohul and Shakuntala Baichoo

*Department of Computer Science and Engineering, University of Mauritius*

**Sun. 2.5**

**14:00-14:15**

**GCVT – A Genome Comparison and Viewing Tool**

Shakuntala Baichoo, Parinita Ujoodha and Yovish Bissessur

*Department of Computer Science and Engineering, University of Mauritius*

**Sun. 2.6**

**14:15-14:30**

**Towards an era of epidemiological databases for autoimmune diseases**

Vassiliki Gkantouna<sup>1</sup>, Marina Ioannou<sup>1</sup>, Athanasios Tsakalidis<sup>1</sup>, Emmanouil Viennas<sup>1</sup>, Konstantinos Poulas<sup>2</sup>, Ioannis Tsaknakis<sup>3</sup> and Giannis Tzimas<sup>3</sup>

<sup>1</sup>*Department of Computer Engineering and Informatics, Faculty of Engineering, University of Patras, Patras, Greece;* <sup>2</sup>*Department of Pharmacy, School of Health Sciences, University of Patras, Patras, Greece;* <sup>3</sup>*Department of Applied Informatics in Management & Economy, Faculty of Management and Economics, Technological Educational Institute of Messolonghi, Messolonghi, Greece*

**Sun. 2.7**

**14:30-14:45**

**Experiences in Designing a Distributed Service-Oriented Platform for In-Silico Biomarker Discovery and Validation**

Ioan Lucian Muntean<sup>1</sup>, Bogdan Mircea Rotaru<sup>1</sup>, Ramona Suharoschi<sup>2</sup> and Cristina Adela Iuga<sup>3</sup>

<sup>1</sup>*Computer Science Department, Technical University of Cluj-Napoca, Romania;* <sup>2</sup>*Food Science and Technology Department, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania;* <sup>3</sup>*Drug Analysis Department, University of Medicine and Pharmacy, Cluj-Napoca, Romania*

**Coffee Break**

**14:45-15:15**

Sunday Afternoon, 11<sup>th</sup> November

**Session:** ECG

**Time & Place:** 13:00-14:45 – Diana

**Chairpersons:** Hossein Rabbani, *Department of Medical Physics and Engineering, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran & Medical Image and Signal Processing Research Center, Isfahan University of Medical Sciences, Isfahan, Iran*  
Alexandros Kyriakides, *KIOS Research Center, Department of Electrical & Computer Engineering, University of Cyprus, Nicosia, Cyprus*

**Sun. 3.1**

**13:00-13:15**

**ECG Analysis in the Time-Frequency Domain** \*\*

Neophytos Neophytou<sup>1</sup>, Alexandros Kyriakides<sup>2</sup> and Costas Pitris<sup>2</sup>

<sup>1</sup>*Department of Biomedical Engineering, University of Patras;* <sup>2</sup>*KIOS Research Center, Department of Electrical & Computer Engineering, University of Cyprus, Nicosia, Cyprus*

**Sun. 3.2**

**13:15-13:30**

**Time-Frequency Analysis of Heart Rate Variability for Sleep and Wake Classification** \*\*

Xi Long<sup>1</sup>, Pedro Fonseca<sup>1</sup>, Reinder Haakma<sup>1</sup>, Ronald Aarts<sup>1</sup> and Jérôme Foussier<sup>2</sup>

<sup>1</sup>*Philips Research and Eindhoven University of Technology, The Netherlands;* <sup>2</sup>*RWTH Aachen University, Germany)*

**Sun. 3.3**

**13:30-13:45**

**Partial Linear Transformation of Vectorcardiogram to 12 Lead Electrocardiogram Signals** \*\*\*

Alireza Mehrdehnavi<sup>1,2</sup>, Niloofer Salehpour<sup>1</sup>, Hossein Rabbani<sup>1,2</sup>, Mohaddeseh Behjati<sup>3</sup>

<sup>1</sup>*Department of Medical Physics and Engineering, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran;* <sup>2</sup>*Medical Image and Signal Processing Research Center, Isfahan University of Medical Sciences, Isfahan, Iran;* <sup>3</sup>*Department of Internal Medicine, Medical School, Isfahan University of Medical Sciences, Isfahan, Iran*

**Sun. 3.4**

**13:45-14:00**

**Posterior ECG: Producing a New Electrocardiogram Signal from Vectorcardiogram Using Partial Linear Transformation** \*\*

Alireza Mehrdehnavi<sup>1,2</sup>, Niloofer Salehpour<sup>1</sup>, Hossein Rabbani<sup>1,2</sup>, Mohaddeseh Behjati<sup>3</sup>

<sup>1</sup>*Department of Medical Physics and Engineering, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran;* <sup>2</sup>*Medical Image and Signal Processing Research Center, Isfahan University of Medical Sciences, Isfahan, Iran;* <sup>3</sup>*Department of Internal Medicine, Medical School, Isfahan University of Medical Sciences, Isfahan, Iran*

Sun. 3.5

14:00-14:15

**Embedded Real-Time ECG Delineation Methods: a Comparative Evaluation** ``

Ruben Braojos<sup>1</sup>, Giovanni Ansaloni<sup>1</sup>, David Atienza<sup>1</sup> and Francisco J. Rincón<sup>2</sup>

<sup>1</sup>*École Polytechnique Fédérale de Lausanne, Switzerland;* <sup>2</sup>*Universidad Complutense de Madrid, Spain*

Sun. 3.6

14:15-14:30

**IcyHeart: Highly integrated ultra-low-power SoC solution for unobtrusive and energy efficient wireless cardiac monitoring** ``

Marios Milis<sup>1</sup>, Kyriacos Michaelides<sup>1</sup>, Anastasis Kounoudes<sup>1</sup>, Frederic Giroud<sup>2</sup>, Pierre-Francois Ruedi<sup>2</sup>, Giovanni Ansaloni<sup>3</sup>, David Atienza<sup>3</sup> and Frederic Masson<sup>4</sup>

<sup>1</sup>*SignalGeneriX Ltd, Limassol, Cyprus;* <sup>2</sup>*Centre Suisse d'Electronique et de Microtechnique (CSEM), Neuchatel, Switzerland;* <sup>3</sup>*Embedded Systems Laboratory (ESL), Ecole Polytechnique Federale De Lausanne (EPFL), Lausanne, Switzerland;* <sup>4</sup>*DOLPHIN Integration, Grenoble, France*

Sun. 3.7

14:30-14:45

**An Appendix to Embedded Designs of QRS Detectors** ``

Stojanovic Radovan<sup>1</sup>, Sasa Knezevc<sup>1</sup> and Dejan Karadagic<sup>2</sup>

<sup>1</sup>*Faculty of Electrical Engineering University of Montenegro, Podgorica, Montenegro, Dejan Karadagić;* <sup>2</sup>*School of Electrical and Electronic Engineering, University of Manchester Manchester, United Kingdom*

Coffee Break

14:45-15:15



Sunday Afternoon, 11<sup>th</sup> November

**Session:** Keynote Sun. 1

**Time & Place:** 15:40-16:25 – Les Etoiles

**Chairperson:** Christos N. Schizas, *Department of Computer Science, University of Cyprus*

**Keynote Sun. 1**

**15:40-16:25**

**The Effects of Nicotine Exposure on the Complexity and the Genetic Patterns of Dopamine Neurons in VTA**

Metin Akay

*Founding Chair, John S Dunn Endowed Chair Professor, Department of Biomedical Engineering, Cullen College of Engineering, University of Houston, Houston, TX, USA*

Tour to Athienou village and dinner

**16:30-21:30**

Monday Morning, 12<sup>th</sup> November

**Session:** Intelligent Systems

**Time & Place:** 8:30-10:00 - Les Etoiles

**Chairpersons:** Alexander Astaras, *Department of Automation, Alexander Technological Educational Institute of Thessaloniki, Greece*  
Kleanthis Neokleous, *Department of Computer Science, University of Cyprus, Nicosia, Cyprus*

**Mon. 4.1**

**08:30-08:45**

**Development and Evaluation of an Open Source Wearable Navigation Aid for Visually Impaired Users (CYCLOPS) ..**

Barbara Salonikidou<sup>1</sup>, Dimitris Savvas<sup>1</sup>, Georgios Diamantis and Alexander Astaras<sup>1,3</sup>

<sup>1</sup>*Department of Automation, Alexander Technological Educational Institute of Thessaloniki, Greece;* <sup>2</sup>*Thessaloniki School for the Blind, Thessaloniki, Greece;* <sup>3</sup>*Laboratory of Medical Informatics, Medical School, Aristotle University of Thessaloniki, Greece*

**Mon. 4.2**

**08:45-09:00**

**Development of a Knowledge Base for smart screening of language disorders in primary care ...**

María Luisa Martín Ruiz<sup>1</sup>, Miguel Ángel Valero Duboy<sup>1</sup>, Iván Pau de La Cruz<sup>1</sup>, M<sup>a</sup> Teresa Ferrando Lucas<sup>2</sup> and María Peñafiel Puerto<sup>2</sup>

<sup>1</sup>*Departamento de Ingeniería y Arquitecturas Telemáticas, EUIT de Telecomunicación, Universidad Politécnica de Madrid, Madrid, Spain;* <sup>2</sup>*La Salle Campus, Universidad Autónoma de Madrid, Madrid, Spain*

**Mon. 4.3**

**09:00-09:15**

**A Gaussian Mixture Model to Detect Suction Events in Rotary Blood Pumps ...**

Alexandros Tzallas<sup>1</sup>, George Rigas<sup>1</sup>, Evaggelos Karvounis<sup>1</sup>, Markos Tsipouras, Yorgos Goletsis<sup>1</sup>, Krzysztof Zielinski<sup>2</sup>, Libera Fresiello<sup>2,3</sup>, Dimitrios Fotiadis<sup>1</sup> and Maria Trivella<sup>3</sup>

<sup>1</sup>*Biomedical Research Institute-FORTH, Ioannina, Greece;* <sup>2</sup>*Nalecz Institute of Biocybernetics and Biomedical Engineering, PAS, Warsaw, Poland;* <sup>3</sup>*Institute of Clinical Physiology, Section of Rome, CNR, Rome, Italy*

**Mon. 4.4**

**09:15-09:30**

**The Challenge of Modeling Decision Support Systems for Medical Problems using Fuzzy Cognitive Maps ..**

Peter Groumpos

*Laboratory for Automation and Robotics, Department of Electrical and Computer Engineering, University of Patras, Patra, Greece*

**Mon. 4.5**

**09:30-09:45**

**Region based Support Vector Machine Algorithm for Medical Diagnosis on Pima Indian Diabetes DataSet "**

Savvas Karatsiolis and Christos Schizas

*Computer Science Department, University of Cyprus, Nicosia, Cyprus*

**Mon. 4.6**

**09:45-10:00**

**An Information Retrieval System for Expert and Consumer Users "**

Rena Perakis, Euripides Petrakis and Angelos Hliaoutakis

*Department of Electronic and Computer Engineering, Technical University of Crete (TUC), Chania, Crete, Greece*

Coffee Break

**10:00-10:30**

Monday Morning, 12<sup>th</sup> November

**Session:** **Biomolecular Sequence Analysis**

**Time & Place:** **8:30-10:00 - Minerva**

**Chairpersons:** **Simone Faro, *Dipartimento di Matematica e Informatica, Università di Catania, Catania, Italy***  
**Vasilis J. Promponas, *Department of Biological Sciences, University of Cyprus, Cyprus***

**Mon. 5.1** **08:30-08:45**

**Predicting GPCR and Enzymes Function with a Global Approach Based on LCS** ...

Luiz Romao<sup>1</sup> and Julio Cesar Nievola<sup>2</sup>

<sup>1</sup>*Universidade da Região de Joinville, Departamento de Informática, Joinville - SC – Brasil;* <sup>2</sup>*Pontifícia Universidade Católica do Paraná, Pós-Graduação em Informática, Curitiba - PR – Brasil*

**Mon. 5.2** **08:45-09:00**

**Annotation Guided Local Similarity Search in Multiple Sequences and its Application to Mitochondrial Genomes** ...

Ruby Moritz, Matthias Bernt and Martin Middendorf

*Parallel Computing and Complex Systems Group, Institute of Computer Science, University Leipzig, Germany*

**Mon. 5.3** **09:00-09:15**

**Using protein-domain information for multiple sequence alignment** ...

Layal Al-Ait, Eduardo Corel and Burkhard Morgenstern

*University of Gottingen, Institute of Microbiology and Genetics, Department*

**Mon. 5.4** **09:15-09:30**

**DNA Motifs Detection Algorithms in Long Sequences** ...

Alin Voina, Petre Pop and Mircea Florin Vaida

*Communications Department, Technical University Of Cluj Napoca*

**Mon. 5.5** **09:30-09:45**

**Fast Searching in Biological Sequences Using Multiple Hash Functions** ...

Simone Faro<sup>1</sup> and Thierry Lecroq<sup>2</sup>

<sup>1</sup>*Dipartimento di Matematica e Informatica, Università di Catania, Catania, Italy;* <sup>2</sup>*Université de Rouen, Mont-Saint-Aignan Cedex, France*

Mon. 5.6

09:45-10:00

**SVM-Based miRNA:miRNA\* Duplex Prediction** "

Nestoras Karathanasis<sup>1,3</sup>, Angelos Armen<sup>2</sup>, Ioannis Tsamardinos<sup>2,3</sup> and Panayiota Poirazi<sup>1</sup>

<sup>1</sup>*Institute of Molecular Biology and Biotechnology, Foundation for Research and Technology - Hellas FORTH, Heraklion, Greece;* <sup>2</sup>*Institute of Computer Science, Foundation for Research and Technology - Hellas FORTH, Heraklion, Greece;* <sup>3</sup>*Department of Biology, University of Crete;* <sup>4</sup>*Department of Computer Science, University of Crete*

Coffee Break

10:00-10:30

Monday Morning, 12<sup>th</sup> November

**Session:** ECG and Biosignal Analysis

**Time & Place:** 8:30-10:00 - Diana

**Chairpersons:** Christina Orphanidou, *Institute of Biomedical Engineering, Univ. of Oxford, UK*  
Harris Papadopoulos, *Frederick University Cyprus, Limassol, Cyprus*

**Mon. 6.1** **08:30-08:45**

**Probabilistic Detection of Vital Sign Abnormality with Gaussian Process Regression** ...

David Wong, David Clifton and Lionel Tarassenko

*Institute of Biomedical Engineering, University of Oxford, Oxford, UK*

**Mon. 6.2** **08:45-09:00**

**A Method for Assessing the Reliability of Heart Rates obtained from Ambulatory ECG** ...

Christina Orphanidou<sup>1</sup>, Timothy Bonnici<sup>2</sup>, David Vallance<sup>3</sup>, Alexander Darrell<sup>1</sup>, Peter Charlton<sup>4</sup> and Lionel Tarassenko<sup>1</sup>

<sup>1</sup>*Institute of Biomedical Engineering, University of Oxford, UK;* <sup>2</sup>*Nuffield Department of Medicine, University of Oxford, UK;* <sup>3</sup>*Nuffield Department of Surgery, University of Oxford, UK;* <sup>4</sup>*Kings College London, King's Health Partners, UK*

**Mon. 6.3** **09:00-09:15**

**Optimal Anisotropic Lead Scaling of Multichannel ECG to Reduce Magnitude Signal Variability** ...

Kai Noponen and Tapio Seppänen

*Department of Computer Science and Engineering, University of Oulu, Oulu, Finland*

**Mon. 6.4** **09:15-09:30**

**Combining Unobtrusive Electrocardiography and Ballistography for more Accurate Monitoring of Sleep** ...

Antti Vehkaoja, Mikko Peltokangas, Jarmo Verho and Jukka Lekkala

*Department of Automation Science and Engineering, Tampere University of Technology, Finland*

**Mon. 6.5**

**09:30-09:45**

**Evaluation of T-wave alternans in comparison with ECG stress test and scintigraphic examination in patients with coronary artery disease** ...

Dariusz Janusek<sup>1</sup>, Michal Kania<sup>1</sup>, Małgorzata Kobylecka<sup>2</sup>, Rajmund Zaczek<sup>3</sup>, Leszek Królicki<sup>2</sup>, Grzegorz Opolski<sup>3</sup> and Roman Maniewski<sup>1</sup>

<sup>1</sup>*Institute of Biocybernetic and Biomedical Engineering, Warsaw, Poland;* <sup>2</sup>*Nuclear Medicine Laboratory, Central Clinical Hospital of the Warsaw Medical University, Warsaw, Poland;* <sup>3</sup>*Cardiology Clinic, Central Clinical Hospital of the Warsaw Medical University, Warsaw, Poland*

**Mon. 6.6**

**09:45-10:00**

**Calibrated Probabilistic Predictions for Biomedical Applications** ...

Antonis Lambrou<sup>1,2</sup>, Harris Papadopoulos<sup>1,2,3</sup> and Alexander Gammerman<sup>2</sup>

<sup>1</sup>*Frederick Research Center, Nicosia,* <sup>2</sup>*Cyprus Computer Learning Research Centre, Royal Holloway, University of London, UK;* <sup>3</sup>*Department of Computer Science and Engineering, Frederick University, Limassol, Cyprus*

**Coffee Break**

**10:00-10:30**

Monday Morning, 12<sup>th</sup> November

**Session:** Keynote Mon. 1 & 2

**Time & Place:** 10:30-12:00 – Les Etoiles

**Chairperson:** Dimitrios Fotiadis, *Biomedical Research Institute-FORTH, Ioannina, Greece*

**Keynote Mon. 1** **10:30-11:15**

**From 6-Ps Medicine to Cardiovascular Health Informatics**

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*

**Keynote Mon. 2** **11:15-12:00**

**Computer-Aided Interpretation of Vascular Images towards Valid Diagnosis and Risk Stratification of Atherosclerosis**

Konstantina Nikita

*Professor and Deputy Head of Faculty of Electrical Engineering at the N.T.U.A., Athens, Greece*

Jointly supported by the IEEE EMBS Cyprus Chapter



Monday Morning, 12<sup>th</sup> November

**Session:** Intervention and Therapeutic Systems

**Time & Place:** 12:00-13:30 – Les Etoiles

**Chairpersons:** Eftychios Christoforou, *KIOS Research Center, University of Cyprus, Cyprus*  
Sotos Voskarides, *Cyprus University of Technology (CUT), Cyprus*

**Mon. 7.1**

**12:00-12:15**

**A software platform controlling an MRI guided focused ultrasound system**

Christos Yiallouras<sup>1,3</sup>, Marinos Ioakim<sup>2</sup>, Alexis Alexandrou<sup>2</sup>, Venediktos Hadjisavvas<sup>1,3</sup>, Nicos Milonas<sup>1,4</sup> and Christakis Damianou<sup>2,3</sup>

<sup>1</sup>City University, London, UK; <sup>2</sup>Frederick University Cyprus, Limassol, Cyprus; <sup>3</sup>MEDSONIC, LTD, Limassol, Cyprus; <sup>4</sup>Frederick Institute of Technology, Limassol, Cyprus.

**Mon. 7.2**

**12:15-12:30**

**Combining Reflector Focused and Phased Array Beamforming for Microwave Diagnosis and Therapy**

Konstantinos Karathanasis<sup>1</sup> and Irene Karanasiou<sup>2</sup>

<sup>1</sup>Department of Electrical and Computer Engineering, University of Cyprus, Nicosia, Cyprus; <sup>2</sup>Department of Electrical and Computer Engineering, Institute of Communication and Computer Systems, National Technical University of Athens, Athens, Greece

**Mon. 7.3**

**12:30-12:45**

**Development and initial testing of a prototype concentric tubes robot for surgical interventions**

Costas Sophocleous<sup>1</sup>, Eftychios Christoforou<sup>2</sup>, Panayiotis Shiakolas<sup>3</sup>, Ioannis Seimenis<sup>4</sup>, Nikolaos Tsekos<sup>5</sup> and Charalambos Doumanidis<sup>1</sup>

<sup>1</sup>Department of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus; <sup>2</sup>KIOS Research Center, University of Cyprus, Nicosia, Cyprus; <sup>3</sup>Mechanical and Aerospace Engineering, The University of Texas at Arlington, Arlington, TX, USA; <sup>4</sup>Department of Medicine, Democritus University of Thrace, Alexandroupolis, Greece; <sup>5</sup>Department of Computer Science, University of Houston, Houston, TX, USA

**Mon. 7.4**

**12:45-13:00**

**A predictive control approach and interactive GUI to enhance distal environment rendering during robotized tele-echograph**

Pierre Vieyres<sup>1</sup>, Soteris Avgousti<sup>2</sup>, Marco Chiccoli<sup>1</sup>, Juan Sandoval<sup>1</sup>, Cyril Novales<sup>1</sup>, Laurence Jossierand<sup>1</sup>, Aïcha Fonte<sup>1</sup>, Sotos Voskarides<sup>2</sup> and Takis Kasparis<sup>2</sup>

<sup>1</sup>Laboratory Prisme, University of Orleans, France; <sup>2</sup>Telemedicine research laboratory, Cyprus University of Technology (CUT), Limassol, Cyprus

**Mon. 7.5**

**13:00-13:15**

**Design of a New Nanostructure for Theranostic Applications** ...

Myria Angelidou and Costas Pitris

*KIOS Research Center for Intelligent Systems and Networks, Department of Electrical and Computer Engineering, University of Cyprus, Nicosia, Cyprus*

**Mon. 7.6**

**13:15-13:30**

**Relating Postural Synergies to Low-D Muscular Activations: Towards Bio-inspired Control of Robotic Hands** ...

Pantelis Katsiaris<sup>1</sup>, Panagiotis Artemiadis<sup>2</sup> and Kostas Kyriakopoulos<sup>1</sup>

*<sup>1</sup>Control Systems Lab, School of Mechanical Engineering, National Technical University of Athens; <sup>2</sup>ASU Human-Oriented Robotics and Control Lab, School for Engineering of Matter, Transport and Energy, Ira A. Fulton Schools of Engineering, Arizona State University*

**Lunch Break**

**13:30-14:30**

Monday Morning, 12<sup>th</sup> November

**Session:** **Biomolecular Structure Analysis**

**Time & Place:** **12:00-13:15 – Minerva**

**Chairpersons:** **Takeao Ohkawa, *Graduate School of System Informatics, Kobe University, Japan***  
**Nicolae Goga, *Molecular Dynamics Group, University of Groningen, Groningen, The Netherlands, and Politehnica University of Bucharest, Bucharest, Romania***

**Mon. 8.1** **12:00-12:15**

**GPU-SD and DPD Parallelization for Gromacs tools for molecular dynamics simulations** ...

Nicolae Goga<sup>1</sup>, Siewert Marrink<sup>1</sup>, Herman Berendsen<sup>1</sup>, Ruxandra Cioromela<sup>2</sup> and Florica Moldoveanu<sup>2</sup>  
<sup>1</sup>*Molecular Dynamics Group University of Groningen Groningen, The Netherlands;* <sup>2</sup>*Department of Computer Science Politehnica University of Bucharest Bucharest, Romania*

**Mon. 8.2** **12:15-12:30**

**Binding site extraction by similar subgraphs mining from protein molecular surfaces** ..

Natsumi Kurumatani, Hiroyuki Monji and Takeao Ohkawa  
*Graduate School of System Informatics, Kobe University, Nada, Kobe, Japan*

**Mon. 8.3** **12:30-12:45**

**Genome-wide Search for Coaxial Helical Stacking Motifs** ..

Kevin Byron, Jason Wang and Dongrong Wen  
*Bioinformatics Program and Department of Computer Science, New Jersey Institute of Technology, Newark, New Jersey, USA*

**Mon. 8.4** **12:45-13:00**

**Enhancing the effectiveness of virtual screening by using the ChemBioServer: Application to the discovery of PI3K $\alpha$  inhibitors** ...

Paraskevi Gkeka, Emmanouil Athanasiadis, George Spyrou and Zoe Cournia  
*Biomedical Research Foundation of the Academy of Athens (BRFAA), Athens, Greece*

**Mon. 8.5** **13:00-13:15**

**Sequence Features of Compositionally Biased Regions in Three Dimensional Protein Structures** ...

Stella Tamana, Ioannis Kirmizoglou and Vasilis Promponas  
*Bioinformatics Research Laboratory, Department of Biological Sciences, University of Cyprus, Nicosia, Cyprus*

**Lunch Break** **13:30-14:30**

Monday Morning, 12<sup>th</sup> November

**Session:** EEG and Biosignal Analysis

**Time & Place:** 12:00-13:30 – Diana

**Chairpersons:** Nicoletta Nicolaou, *Department of Electrical and Computer Engineering, University of Cyprus, Cyprus*  
Marios Neophytou, *Department of Computer Science, University of Cyprus, Cyprus*

**Mon. 9.1**

**12:00-12:15**

**EEG-based automatic sleep-wake classification in humans using short and standard epoch lengths** ...

Arnaud Brignol<sup>1</sup>, Tarik Al-Ani<sup>1</sup> and Xavier Drouot<sup>2</sup>

<sup>1</sup>Département Informatique-ISBS, ESIEE-Paris, France; <sup>2</sup>Service de Physiologie, Hopital Henri Mondor, France

**Mon. 9.2**

**12:15-12:30**

**What are the symbols of Alzheimer? A Permutation Entropy based symbolic analysis for the detection of early changes of the electroencephalographic complexity due to mild Alzheimer** ...

Christos Frantzidis<sup>1</sup>, Aristeia Ladas<sup>2</sup>, Maria Diamantoudi<sup>2</sup>, Anastasia Semertzidou<sup>1</sup>, Eirini Grigoriadou<sup>1</sup>, Anthoula Tsolaki<sup>3</sup>, Despoina Liapi<sup>3</sup>, Anatoli Papadopoulou<sup>2</sup>, Fotini Kounti<sup>3</sup>, Ana Vivas<sup>2</sup>, Magda Tsolaki<sup>3</sup>, Costas Pappas<sup>1</sup> and Panagiotis Bamidis<sup>1</sup>

<sup>1</sup>Laboratory of Medical Informatics, Medical School, Aristotle University (AUTH), Thessaloniki, Greece; <sup>2</sup>Psychology Department, City College International Faculty of the University of Sheffield & South East European Research Center Thessaloniki, Greece; <sup>3</sup>Greek Association of Alzheimer's Disease and Related Disorders, Thessaloniki, Greece

**Mon. 9.3**

**12:30-12:45**

**Temporal dynamics of EEG during anesthesia** ...

Nicoletta Nicolaou, Andria Dionysiou and Julius Georgiou

*Holistic Electronics Research Lab, Department of Electrical and Computer Engineering, University of Cyprus, Nicosia, Cyprus*

**Mon. 9.4**

**12:45-13:00**

**Exploration of Instantaneous Amplitude and Frequency Features for Epileptic Seizure Prediction** ...

Ning Wang and Michael R. Lyu

*Department of Computer Science and Engineering, The Chinese University of Hong Kong, Hong Kong*

**Mon. 9.5**

**13:00-13:15**

**Prediction of the Parkinsonian subthalamic nucleus spike activity from local field potentials using nonlinear dynamic models**

Kyriaki Kostoglou<sup>1</sup>, Kostis Michmizos<sup>2</sup>, Pantelis Stathis<sup>3</sup>, Damianos Sakas<sup>3</sup>, Konstantina Nikita<sup>4</sup> and Georgios Mitsis<sup>1</sup>

<sup>1</sup>*Department of Electrical and Computer Engineering, University of Cyprus, Nicosia, Cyprus;* <sup>2</sup>*Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge MA;* <sup>3</sup>*Department of Neurosurgery, National and Kapodistrian University of Athens, Athens, Greece;* <sup>4</sup>*Department of Electrical and Computer Engineering, National Technical University of Athens, Athens, Greece*

**Mon. 9.6**

**13:15-13:30**

**Investigation of network brain dynamics from EEG measurements in patients with epilepsy using graph-theoretic approaches**

Manolis Christodoulakis<sup>1</sup>, Maria Anastasiadou<sup>1</sup>, Savvas Papacostas<sup>2</sup>, Eleftherios Papathanasiou<sup>2</sup> and Georgios Mitsis<sup>1</sup>

<sup>1</sup>*Department of Electrical and Computer Engineering, University of Cyprus, Nicosia, Cyprus;* <sup>2</sup>*Clinic B', The Cyprus Institute of Neurology and Genetics, Nicosia, Cyprus*

**Lunch Break**

**13:30-14:30**

Monday Afternoon, 12<sup>th</sup> November

**Session:** Sensing and Processing

**Time & Place:** 14:30-16:00 – Les Etoiles

**Chairpersons:** Mehrdad Nourani, *University of Texas at Dallas and Presbyterian Wound Care Clinic, TX, USA*  
Andreas Spanias, *SenSIP Center and Industry Consortium, School of ECEE, Arizona State University, Tempe, AZ, USA*

**Mon. 10.1**

**14:30-14:45**

**Continuous Plantar Pressure Modeling Using Sparse Sensors** \*\*

Sarah Ostadabbas, Mehrdad Nourani and Matthew Pompeo  
*University of Texas at Dallas and Presbyterian Wound Care Clinic*

**Mon. 10.2**

**14:45-15:00**

**Development of a Reflectance Photoplethysmographic Sensor used for the Assessment of Perfusion of Free Jejunum Flaps: a case report** \*\*

Tina Zaman<sup>1</sup>, Panicos Kyriacou<sup>1</sup>, Alla Belhaj<sup>2</sup>, Richard Langford<sup>2</sup> and Hasu Patel<sup>3</sup>  
<sup>1</sup>*School of Engineering and Mathematical Sciences, City University London, London, UK;* <sup>2</sup>*Pain and Anaesthesia Research Centre;* <sup>3</sup>*Department of Plastics and Reconstructive Surgery, Barts and the London NHS Trust, UK, London, UK*

**Mon. 10.3**

**15:00-15:15**

**Antennas on metamaterial substrates as emitting components for THz biomedical imaging** \*\*\*

Maria Koutsoupidou<sup>1</sup>, Irene Karanasiou<sup>2</sup> and Nikolaos Uzunoglu<sup>1</sup>  
<sup>1</sup>*School of Electrical & Computer Engineering, National Technical University of Athens, Athens, Greece;* <sup>2</sup>*Institute of Communication and Computer Systems, National Technical University of Athens, Athens, Greece*

**Mon. 10.4**

**15:15-15:30**

**Biodegradable Encapsulation for Inductively Measured Resonance Circuit** \*\*\*

Timo Salpavaara<sup>1</sup>, Jukka Leikkala<sup>1</sup>, Saiful Khan<sup>2</sup>, Ville Ellä<sup>2</sup>, Minna Kellomäki<sup>2</sup>  
<sup>1</sup>*Department of Automation Science and Engineering, Tampere University of Technology, Tampere, Finland and BioMediTech, Tampere, Finland;* <sup>2</sup>*Department of Biomedical Engineering, Tampere University of Technology, Tampere, Finland, and BioMediTech, Tampere, Finland*

**Mon. 10.5**

**15:30-15:45**

**Quantitative assessment of the pupillary photomotor response dynamics to tunable, narrow band stimuli** \*\*\*

Vassilis Kavvadias and Costas Balas  
*Department of Electronic and Computer Engineering, Technical University of Crete, Chania, Greece*

**Mon. 10.6**

**15:45-16:00**

**Point-of-Care Diagnosis of Urinary tract infection (UTI) Using Surface Enhanced Raman Spectroscopy (SERS) ..**

Katerina Hadjigeorgiou<sup>1</sup>, Evdokia Kastanos<sup>2</sup>, Alexandros Kyriakides<sup>1</sup> and Costas Pitris<sup>1</sup>

<sup>1</sup>*KIOS Research Center for Intelligent Systems and Networks, Department of Electrical and Computer Engineering, University of Cyprus, Nicosia, Cyprus;* <sup>2</sup>*University of Nicosia, Department of Life and Health Sciences, Nicosia, Cyprus*

Coffee Break

16:00-16:30

Tour to down town Larnaca and dinner

16:30-22:00

Monday Afternoon, 12<sup>th</sup> November

**Session:** Functional Genomics and Proteomics

**Time & Place:** 14:30-16:00 – Minerva

**Chairpersons:** Christos Ouzounis, *Centre for Research & Technology Hellas (CERTH), Thessalonica, Greece, and The Terrence Donnelly Centre for Cellular & Biomolecular Research (CCBR), University of Toronto, Canada*  
Miguel Arturo Barreto-Sanz, *University of Applied Sciences of Western Switzerland (HEIG-VD), Vaud, Switzerland*

**Mon. 11.1** **14:30-14:45**

**Unsupervised analysis of leukemia and normal hematopoiesis by joint clustering of gene expression data** ...

Liviu Badea

*Bioinformatics Group, National Institute for Research in Informatics, Bucharest, Romania*

**Mon. 11.2** **14:45-15:00**

**Microarray classification with hierarchical data representation and novel feature selection criteria** ...

Mattia Bosio, Pau Bellot Pujalte, Philippe Salembier and Albert Oliveras-Vergés

*Department of Signal Theory and Communications, Technical University of Catalonia UPC, Barcelona*

**Mon. 11.3** **15:00-15:15**

**Experimental Analysis of Feature Selection Stability for High-Dimension and Low-Sample Size Gene Expression Classification Task** ...

David Deroncourt<sup>1,2</sup>, Blaise Hanczar<sup>3</sup> and Jean-Daniel Zucker<sup>1,2,4</sup>

*<sup>1</sup>Institut National de la Santé et de la Recherche Médicale, Nutriomique, Centre de Recherches des Cordeliers, Paris, France; <sup>2</sup>Université Pierre et Marie-Curie - Paris, Paris, France; <sup>3</sup>LIPADE, Université Paris Descartes, France; <sup>4</sup>Institut de Recherche pour le Développement, IRD, UMMISCO, France Nord, Bondy, France*

**Mon. 11.4** **15:15-15:30**

**Evolving very compact fuzzy systems for gene expression data analysis** ...

Miguel Arturo Barreto-Sanz, Alexandre Bujard and Carlos Andrés Peña-Reyes

*University of Applied Sciences of Western Switzerland (HEIG-VD), Vaud, Switzerland*

**Mon. 11.5** **15:30-15:45**

**Clustering Microarray Data using Fuzzy Clustering with Viewpoints** ...

Katerina Karayianni<sup>1</sup>, George Spyrou<sup>2</sup> and Konstantina Nikita<sup>1</sup>

*<sup>1</sup>School of Electrical and Computer Engineering, National Technical University of Athens, Athens, Greece; <sup>2</sup>Biomedical Research Foundation, Academy of Athens, Athens, Greece*



**Mon. 11.6**

**15:45-16:00**

**A Novel Ensemble Selection Method for Cancer Diagnosis Using Microarray Datasets ...**

Mohammed Gaafar, Noha Yousri and Mohamed Ismail

*Computer and System Engineering Department, Faculty of Engineering, Alexandria University*

Coffee Break

16:00-16:30

Tour to down town Larnaca and dinner

16:30-22:00

Monday Afternoon, 12<sup>th</sup> November

**Session:** Biosignal Processing and Analysis

**Time & Place:** 14:30-16:00 – Diana

**Chairpersons:** Michalis Zervakis, *Department of Electronics and Computer Engineering, Technical University of Crete, Chania, Greece*  
Panikos Heracleous, *ATR, Intelligent Robotics and Communication Laboratories, Japan*

**Mon. 12.1** **14:30-14:45**

**Decomposition and Evaluation of activity in multiple ERP trials** \*\*\*

Kostas Michalopoulos<sup>1,2</sup>, Michalis Zervakis<sup>1</sup>, Nikolaos Bourbakis<sup>2</sup>, Panteleimon Giannakopoulos<sup>3</sup> and Marie-Pierre Deiber<sup>4,5</sup>

<sup>1</sup>*Department of Electronics and Computer Engineering, Technical University of Crete, Chania, Greece;* <sup>2</sup>*Wright State University –ATR Center, Dayton OH, 2AIIIS Inc. Centreville OH and 3NIA, Baltimore, MD;* <sup>3</sup>*Division of General Psychiatry, Department of Psychiatry, University Hospitals of Geneva, Switzerland;* <sup>4</sup>*INSERM Unit 1039, Faculty of Medicine, La Tronche, France;* <sup>5</sup>*Clinical Neurophysiology and Neuroimaging Unit, Division of Neuropsychiatry, Department of Psychiatry, University Hospitals of Geneva, Switzerland*

**Mon. 12.2** **14:45-15:00**

**A brain-computer interface for chronic pain patients using epidural ECoG and visual feedback** \*\*

Armin Walter<sup>1</sup>, Georgios Naros<sup>2</sup>, Alexander Roth<sup>1</sup>, Wolfgang Rosenstiel<sup>1</sup>, Alireza Gharabaghi<sup>2</sup> and Martin Bogdan<sup>1,3</sup>

<sup>1</sup>*Department of Computer Engineering, Wilhelm-Schickard-Institute, University of Tübingen, Germany;* <sup>2</sup>*Werner Reichardt Centre for Integrative Neuroscience and Department of Neurosurgery, University Hospital, University of Tübingen, Germany;* <sup>3</sup>*Department of Computer Engineering, Faculty of Mathematics and Computer Science, University of Leipzig, Germany*

**Mon. 12.3** **15:00-15:15**

**Lung Capacity Estimation Through Acoustic Signal of Breath** \*\*

Ahmad Abushakra and Miad Faezipour

*Department of Computer Science & Engineering, University of Bridgeport, Bridgeport*

**Mon. 12.4** **15:15-15:30**

**The Role of the Lombard Reflex in Parkinson's Disease** \*\*

Panikos Heracleous<sup>1</sup>, Jani Even<sup>1</sup>, Carlos Ishi<sup>1</sup>, Masaki Kondo<sup>2</sup>, Kyoko Takanohara<sup>3</sup>, Takahiro Miyashita<sup>1</sup> and Norihiro Hagita<sup>1</sup>

<sup>1</sup>*ATR, Intelligent Robotics and Communication Laboratories, Japan;* <sup>2</sup>*Department of Neurology, Kyoto Prefectural University of Medicine, Japan;* <sup>3</sup>*Rehabilitation Unit, Kyoto Prefectural University of Medicine, Japan*

**Mon. 12.5**

**15:30-15:45**

**Emotion Classification Based on Forehead Biosignals using Support Vector Machines in Music Listening**

Mohsen Najj<sup>1</sup>, Mohammad Firoozabadi<sup>2</sup> and Parviz Azadfallah<sup>3</sup>

<sup>1</sup>*Department of Biomedical Engineering, Islamic Azad University, Science and Research branch, Tehran, Iran;* <sup>2</sup>*Department of Medical Physics, Tarbiat Modares University, Tehran, Iran;* <sup>3</sup>*Department of Psychology, Tarbiat Modares University, Tehran, Iran*

**Mon. 12.6**

**15:45-16:00**

**Automated tumor segmentation using kernel sparse representations**

Jayaraman J. Thiagarajan, Deepta Rajan, Karthikeyan Natesan Ramamurthy, David Frakes and Andreas Spanias

*SenSIP Center and Industry Consortium, School of ECEE, Arizona State University, Tempe, AZ, USA*

Coffee Break

16:00-16:30

Tour to down town Larnaca and dinner

16:30-22:00

Tuesday Morning, 13<sup>th</sup> November

**Session:** Special Session 1<sup>1</sup> – Frameworks for large-scale data sharing, semantics and related sociotechnical issues

**Time & Place:** 8:30-10:00 - Les Etoiles

**Chairpersons:** Vaggelis Sakkalis, *Computer Medicine Laboratory, Institute of Computer Science, FORTH, Heraklion, Crete, Greece*  
Athos Antoniadis, *University of Cyprus, Cyprus*

**Tue. SS. 13.1**

**08:30-08:45**

**Data Integration and Feature Selection in High-volume Molecular and Imaging Datasets** ``

Konstantinos Moutselos<sup>1</sup>, Ilias Maglogiannis<sup>1</sup> and Aristotelis Chatziioannou<sup>2</sup>

<sup>1</sup>*Konstantinos Moutselos, Ilias Maglogiannis Department of Computer Science and Biomedical Informatics University of Central Greece, Lamia, Greece;* <sup>2</sup>*Institute of Biological Research and Biotechnology National Hellenic Research Foundation Athens, Greece*

**Tue. SS. 13.2**

**08:45-09:00**

**Identifying the Semantics of Eligibility Criteria of Clinical Trials based on relevant Medical Ontologies** ``

Anca Bucur<sup>1</sup>, Jasper van Leeuwen<sup>1</sup>, David Perez Del Rey<sup>2</sup>, Brecht Claerhout<sup>3</sup>, Kristof de Schepper<sup>3</sup> and Raul Alonso Calvo<sup>2</sup>

<sup>1</sup>*Healthcare Information Management Philips Research Europe, Eindhoven, the Netherlands;* <sup>2</sup>*Grupo de Informática Biomédica, Department Inteligencia Artificial, Facultad de Informática, Universidad Politécnica de Madrid, Boadilla del Monte, Madrid, Spain;* <sup>3</sup>*Custodix NV Kortrijksesteenweg 214b3, Sint-Martens-Latem, Belgium*

**Tue. SS. 13.3**

**09:00-09:15**

**A technical infrastructure to support Personalized Medicine** ``

Stelios Sfakianakis<sup>1</sup>, Manolis Tsiknakis<sup>1</sup>, Konstantinos Marias<sup>1</sup> and Norbert Graf<sup>2</sup>

<sup>1</sup>*Computer Medicine Laboratory, Institute of Computer Science, FORTH, Heraklion, Crete, Greece;* <sup>2</sup>*Department for Ped, Oncology / Hematology University Hospital Homburg, Homburg, Germany*

**Tue. 13.4**

**09:15-09:30**

**Legal and Ethical Issues in Integrating Databases for Translational Medical Research within the EU** ``

Iheanyi Nwankwo, Stefanie Haenold and Nikolaus Forgó  
*Institute for Legal Informatics, Leibniz Universität Hannover*

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<sup>1</sup> See Special Session description: *Computational Solutions to Large-scale Data Management and Analysis in Translational and Personalized Medicine*, page xxix.

**Tue. SS. 13.5**

**09:30-09:45**

**e-Prolipsis: A web based risk estimation platform to support and register breast cancer diagnosis in Greece** \*\*

Alexandros Dimopoulos, John Lakoumentas, Argyro Antaraki, Antonios Frigas, Emmanouil Ikonomakis, Marinos Sampson, Anastasios Tagaris, Aikaterini Liakou, Emmanouil Athanasiadis, George Spyrou and Panos Ligomenides

*Biomedical Research Foundation of the Academy of Athens (BRFAA), Athens, Greece*

**Tue. SS. 13.6**

**09:45-10:00**

**A Workflow System for Virtual Screening in Cancer Chemoprevention** \*\*\*

Christos Kannas<sup>1</sup>, Kleo Achilleos<sup>1</sup>, Zinonas Antoniou<sup>1</sup>, Christos Nicolaou<sup>1</sup>, Constantinos Pattichis<sup>1</sup>, Ioanna Kalvari<sup>2</sup>, Ioannis Kirmitzoglou<sup>2</sup> and Vasilis Promponas<sup>2</sup>

<sup>1</sup>*Department of Computer Science, University of Cyprus, Nicosia, Cyprus;* <sup>2</sup>*Department of Biological Sciences, University of Cyprus, Nicosia, Cyprus*

Coffee Break

**10:00-10:30**

Tuesday Morning, 13<sup>th</sup> November

**Session:** Systems Biology

**Time & Place:** 8:30-10:00 - Minerva

**Chairpersons:** Miguel Andrade, *Computational Biology and Data Mining group, Max Delbrück Center for Molecular Medicine, Berlin, Germany* Affiliate investigator at the *Ottawa Hospital Research Institute, Canada*  
Stefano Schivo, *Formal Methods and Tools, Faculty of EEMCS, University of Twente, Enschede, The Netherlands*

**Tue. 14.1**

**08:30-08:45**

**Modelling biological pathway dynamics with Timed Automata** ..

Stefano Schivo<sup>1</sup>, Jetse Scholma<sup>2</sup>, Brend Wanders<sup>3</sup>, Ricardo A. Urquidi Camacho<sup>2</sup>, Paul E. van der Vet<sup>3</sup>, Marcel Karperien<sup>2</sup>, Rom Langerak<sup>1</sup>, Jaco van de Pol<sup>1</sup> and Janine N. Post<sup>2</sup>

<sup>1</sup>*Formal Methods and Tools, Faculty of EEMCS, University of Twente, Enschede, The Netherlands;* <sup>2</sup>*Developmental BioEngineering, MIRA Institute for Biomedical Technology and Technical Medicine, University of Twente, Enschede, The Netherlands;* <sup>3</sup>*Human Media Interaction, Faculty of EEMCS, University of Twente, Enschede, The Netherlands*

**Tue. 14.2**

**08:45-09:00**

**Mathematical Modeling of the Interactions between Cellular Programs in Response to Oncogene Inactivation** ...

Chinyere Nwabugwu<sup>1,3</sup>, Kavya Rakhra<sup>2</sup>, Dean Felsher<sup>2</sup>, David Paik<sup>3</sup>

<sup>1</sup>*Department of Electrical Engineering, Stanford University School of Medicine, Stanford, CA USA;* <sup>2</sup>*Department of Medicine, Stanford University School of Medicine, Stanford, CA USA;* <sup>3</sup>*Department of Radiology, Stanford University School of Medicine, Stanford, CA USA*

**Tue. 14.3**

**09:00-09:15**

**Biological Interaction Networks Based on Sparse Temporal Expansion of Graphical Models** ..

Kalliopi Kalantzaki, Ekaterini Bei, Minos Garofalakis and Michalis Zervakis

*Department of Electronic and Computer Engineering, Technical University of Crete, Chania, Greece,*

**Tue. 14.4**

**09:15-09:30**

**Investigating Survival Prognosis of Glioblastoma Using Evolutional Properties of Gene Networks** ..

Alex Upton and Theodoros Arvanitis

*School of Electronic, Electrical and Computer Engineering, University of Birmingham, Birmingham, England, UK*

**Tue. 14.5**

**09:30-09:45**

**A Graph Theoretic Mathematical Model for Alzheimer's disease (using a systems biology approach) "**

Christina Rose Kyrtos<sup>1</sup> and John Baras<sup>2</sup>

*<sup>1</sup>Institute for Systems Research University of Maryland College Park, MD, US; <sup>2</sup>Institute for Systems Research & Department of Electrical Engineering University of Maryland College Park, MD, US*

**Tue. 14.6**

**09:45-10:00**

**A distributed software package for global sensitivity analysis of biological models "**

Quang Tung Thai, Seokjong Yu and Youngseong Cho

*Department of Supercomputing, Korea Institute of Science and Technology Information (KISTI), Daejeon, Korea South*

Coffee Break

10:00-10:30

Tuesday Morning, 13<sup>th</sup> November

**Session:** Segmentation and Texture Analysis

**Time & Place:** 8:30-10:00 - Diana

**Chairpersons:** Styliani Petroudi, *Department of Computer Science, University of Cyprus, Cyprus*  
Efthymoulos Kyriacou, *Department of Computer Science and Engineering, Frederick University, Limassol, Cyprus*

**Tue. 15.1** **08:30-08:45**

**Application of fast segmentation method for knee contour delineation** ..

Antonio Pinti<sup>1,4</sup>, Raphael Coursier<sup>2</sup>, Eric Watelain<sup>3</sup> and Hechmi Toumi<sup>1</sup>

<sup>1</sup>EA 4708, I3MTO, CHRO - 1 rue Porte Madeleine, Orléans, France; <sup>2</sup>Groupe Hospitalier de l'Institut Catholique de Lille, Lomme, France; <sup>3</sup>LAMIH – UMR 8201 CNRS, Université de Valenciennes, Valenciennes, France; <sup>4</sup>ENSIAME – UVHC, Université de Valenciennes, Valenciennes, France

**Tue. 15.2** **08:45-09:00**

**Automatic Localization of the Optic Disc in Retinal Fundus Images Using Multiple Features** ..

Touseef Ahmad Qureshi<sup>1</sup>, Hassan Amin<sup>2</sup>, Mahfooz Hussain<sup>3</sup>, Rashid Jalal Qureshi<sup>4</sup>, Bashir Al-Diri<sup>1</sup>

<sup>1</sup>University of Lincoln, Lincoln, UK; <sup>2</sup>NUCES, KPK, Pakistan; <sup>3</sup>LadyReading Hospital, KPK, Pakistan; <sup>4</sup>University of Debrecen, Hungary

**Tue. 15.3** **09:00-09:15**

**Interactive binary active contours for prostate contour delineation** ...

Derraz Foued<sup>1,3</sup>, Abdelmalik Taleb-Ahmed<sup>2</sup>, Laurent Peyrodie<sup>3</sup> and Gerard Forzy<sup>1,4</sup>

<sup>1</sup>Faculté Libre de Médecine, Institut Catholique de Lille, France; <sup>2</sup>LAMIH UMR CNRS 8201, Le Mont Houy, Valenciennes, France; <sup>3</sup>HEI, LAGIS UMR CNRS 3304, Lille, France

**Tue. 15.4** **09:15-09:30**

**Video Segmentation of the Common Carotid Artery Intima Media Complex** ..

Christos Loizou<sup>1,2</sup>, Takis Kasparis<sup>2</sup>, Pavlos Papakyriakou<sup>2</sup>, Lakis Christodoulou<sup>2</sup>, Marios Pantziaris<sup>3</sup> and Constantinos Pattichis<sup>4</sup>

<sup>1</sup>Department of Computer Science, Intercollege, Limassol, Cyprus; <sup>2</sup>Department of Electrical Engineering, Computer Engineering & Informatics, Cyprus University of Technology, Limassol, Cyprus; <sup>3</sup>Institute of Neurology and Genetics, Nicosia; <sup>4</sup>Department of Computer Science, University of Cyprus, Nicosia, Cyprus



**Tue. 15.5**

**09:30-09:45**

**Measurement of Motion of Carotid Bifurcation Plaques** ``

Hamed Nasrabadi<sup>1</sup>, Marios Pattichis<sup>1</sup>, Perry Fisher<sup>2</sup>, Andrew Nicolaides<sup>3</sup>, Maura Griffin<sup>3</sup>, Gregory Makris<sup>3</sup>, Efthymoulos Kyriacou<sup>4</sup> and Constantinos Pattichis<sup>5</sup>

<sup>1</sup>*Department of Electrical and Computer Engineering, The University of New Mexico, Albuquerque, NM, USA;* <sup>2</sup>*Sophie Davis School of Biomedical Education, Mack Lipkin Fellow 2012, Astoria, NY, USA;* <sup>3</sup>*Vascular Screening and Diagnostic Centre, London, U.K.;* <sup>4</sup>*Department of Computer Science and Engineering, Frederick University, Limassol, Cyprus;* <sup>5</sup>*Department of Computer Science, University of Cyprus, Nicosia, Cyprus*

**Tue. 15.6**

**09:45-10:00**

**An MPEG-7 Image Retrieval System of Atherosclerotic Carotid Plaque Images** ``

Gianna Ioakim<sup>1</sup>, Efthymoulos Kyriacou<sup>2</sup>, Anastasios Sofocleous<sup>1</sup>, Christodoulos Christodoulou<sup>1</sup> and Constantinos Pattichis<sup>1</sup>

<sup>1</sup>*Department. of Computer Science, University of Cyprus, Nicosia;* <sup>2</sup>*Department of Computer Science and Engineering, Frederick University, Limassol, Cyprus*

**Coffee Break**

**10:00-10:30**

Tuesday Morning, 13<sup>th</sup> November

**Session:** Keynote Tue. 1 & 2

**Time & Place:** 10:30-12:00 – Les Etoiles

**Chairperson:** Vasilis J. Promponas, *Dep. of Biological Sciences, University of Cyprus, Cyprus*

**Keynote Tue. 1**

**10:30-11:15**

**Turning data into predictions of gene and protein function**

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*

**Keynote Tue. 2**

**11:15-12:00**

**From reading to writing (and rewriting) the code of life: the future of biology – scientific, ethical, legal, civil and social issues**

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*

Tuesday Morning, 13<sup>th</sup> November

**Session:** Special Session 2<sup>2</sup> – Algorithms for Marker Selection, Diagnosis, Prognosis and Patient Empowerment

**Time & Place:** 12:00-13:15 – Les Etoiles

**Chairpersons:** Anca Bucur, *Healthcare Information Management Philips Research Europe, Eindhoven, the Netherlands*  
Konstantinos Marias, *Computational Medicine Laboratory, FORTH-ICS Heraklion, Crete, Greece*

**Tue. SS. 16.1**

**12:00-12:15**

**Linked2Safety: A secure linked data medical information space for semantically-interconnecting EHRs advancing patients' safety in medical research** \*\*

Athos Antoniadou<sup>1</sup>, Christos Georgousopoulos<sup>2</sup>, Nikolaus Forgó<sup>3</sup>, Aristos Aristodimou<sup>1</sup>, Federica Tozzi<sup>4</sup>, Panagiotis Hasapis<sup>2</sup>, Konstantinos Perakis<sup>5</sup>, Thanasis Bouras<sup>5</sup>, Dimitris Alexandrou<sup>5</sup>, Eleni Kamateri<sup>6</sup>, Eleni Panopoulou<sup>6</sup>, Konstantinos Tarabanis<sup>6</sup> and Constantinos Pattichis<sup>1</sup>

<sup>1</sup>University of Cyprus, Nicosia, Cyprus; <sup>2</sup>INTRASOFT International, Brussels, Luxembourg; <sup>3</sup>Gottfried Wilhelm Leibniz Universität Hannover, Hannover, Germany; <sup>4</sup>School of Medicine, University of North Carolina, Chapel Hill, NC, USA; <sup>5</sup>Ubitech Ltd., Athens, Greece; <sup>6</sup>The Centre for Research and Technology Hellas, Thessaloniki, Greece

**Tue. SS. 16.2**

**12:15-12:30**

**Influence of Algorithmic Parameters on Marker Selection in Genomic Datasets** \*\*

Theodora Vigideli<sup>1</sup>, Ekaterini Bei<sup>1</sup>, Michalis Zervakis<sup>1</sup> and Dimitrios Kafetzopoulos<sup>2</sup>

<sup>1</sup>Department of Electronic and Computer Engineering, Technical University of Crete, Chania, Crete, Greece; <sup>2</sup>Institute of Molecular Biology and Biotechnology, Foundation of Research and Technology Hellas (FORTH), Heraklion Crete, Greece

**Tue. SS. 16.3**

**12:30-12:45**

**Design Rules for Cancer Nanomedicines** \*\*\*

Triantafyllos Stylianopoulos<sup>1</sup>, Konstantinos Soteriou<sup>1</sup>, Dai Fukumura<sup>2</sup> and Rakesh Jain<sup>2</sup>

<sup>1</sup>Department of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus; <sup>2</sup>Edwin L. Steele laboratory, Department of Radiation Oncology, Massachusetts General Hospital and Harvard Medical School, Boston, USA

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<sup>2</sup> See Special Session description: *Computational Solutions to Large-scale Data Management and Analysis in Translational and Personalized Medicine*, page xxix.

**Tue. SS. 16.4**

**12:45-13:00**

**IEMs: A collaborative Environment for Patient Empowerment** ..

Haridimos Kondylakis<sup>1</sup>, Lefteris Koumakis<sup>1</sup>, Eirini Genitsaridi<sup>1</sup>, Manolis Tsiknakis<sup>1,2</sup>, Konstantinos Marias<sup>1</sup>, Gabriella Pravettoni<sup>3</sup>, Alessandra Gorini<sup>4</sup> and Ketti Mazzocco<sup>3</sup>

<sup>1</sup>*Computational Medicine Laboratory, FORTH-ICS Heraklio, Crete, Greece;* <sup>2</sup>*Department of Applied Informatics and Multimedia, Technological Educational Institute, Heraklion, Crete;* <sup>3</sup>*Centro Interdipartimentale di Ricerca e Intervento sui Processi Decisionali (IRIDe) Università degli Studi di Milano;* <sup>4</sup>*Department of Decision Sciences, Bocconi University, Milan and eCancer – Cancer Intelligence Limited*

**Tue. SS. 16.5**

**13:00-13:15**

**Security Issues in research projects with patient`s medical data** ..

Nikolaus Forgó, Magdalena Goralczyk and Constantin Graf von Rex  
*Institute for Legal Informatics, LUH Hannover, Germany*

**Lunch Break**

**13:30-14:30**

Tuesday Morning, 13<sup>th</sup> November

**Session:** Algorithms and Systems in Bioinformatics

**Time & Place:** 12:00-13:30 – Minerva

**Chairpersons:** Mesude Bicak, *NERC Centre for Ecology and Hydrology, Wallingford, United Kingdom*  
Vasilis J. Promponas, *Dep. of Biological Sciences, University of Cyprus, Cyprus*

**Tue. 17.1** **12:00-12:15**

**Clustering Subjects in Genetic Studies with Self Organizing Maps** \*\*

Aristos Aristodimou, Athos Antoniadis, Constantinos Pattichis  
*Department of Computer Science, University of Cyprus, Nicosia, Cyprus*

**Tue. 17.2** **12:15-12:30**

**Open Source Workflow Systems in Life Sciences Informatics** \*\*

Kleo Achilleos<sup>1</sup>, Christos Kannas<sup>1</sup>, Christodoulos Nicolaou<sup>1</sup>, Constantinos Pattichis<sup>1</sup>, Vasilis Promponas<sup>2</sup>  
<sup>1</sup>*Department of Computer Science, University of Cyprus, Nicosia, Cyprus;* <sup>2</sup>*Department of Biological Sciences, University of Cyprus, Nicosia, Cyprus*

**Tue. 17.3** **12:30-12:45**

**Opportunities from the Use of FPGAs as Platforms for Bioinformatics Algorithms** \*\*\*

Grigorios Chrysos<sup>1</sup>, Euripides Sotiriades<sup>1</sup>, Christos Rousopoulos<sup>1</sup>, Apostolos Dollas<sup>1</sup>, Agathoklis Papadopoulos<sup>2</sup>, Ioannis Kirmitzoglou<sup>2</sup>, Vasilis Promponas<sup>2</sup>, Theocharis Theocharides<sup>2</sup>, George Petihakis<sup>3</sup>, Jacques Lagnel<sup>3</sup>, Panagiotis Vavylis<sup>3</sup>, George Kotoulas<sup>3</sup>  
<sup>1</sup>*Technical University of Crete, Chania, Greece;* <sup>2</sup>*University of Cyprus, Nicosia, Cyprus;* <sup>3</sup>*Hellenic Center for Marine Research, Heraklion, Greece*

**Tue. 17.4** **12:45-13:00**

**A New Iterative Graph Based Clustering Method** \*\*

Erion - Vasilis Pikoulis and Emmanouil Psarakis  
*Department of Computer Engineering and Informatics, University of Patras, 26500 Rio-Patras, Greece*

**Tue. 17.5**

**13:00-13:15**

**sColn: A Scoring algorithm based on COmplex INteractions for reverse engineering regulatory networks** "

Vijender Chaitankar<sup>1</sup>, Preetam Ghosh<sup>1</sup>, Mohamed Elasm<sup>2</sup>, Kurt Gust<sup>3</sup> and Edward Perkins<sup>3</sup>

<sup>1</sup>*Department of Computer Science, Virginia Commonwealth University, Richmond, VA, USA;* <sup>2</sup>*Dept. of Biological Sciences, University of Southern Mississippi, Hattiesburg, MS, USA;* *Environmental Laboratory, E.R.D.C, U.S. Army, Vicksburg, MS, USA*

**Tue. 17.6**

**13:15-13:30**

**Bio-Linux as a Tool for Bioinformatics Training** "

Timothy Booth<sup>1</sup>, Mesude Bicak<sup>1</sup>, Hyun Soon Gweon<sup>1</sup>, Dawn Field<sup>1</sup>, Enis Afgan<sup>2</sup>

<sup>1</sup>*Molecular Evolution and Bioinformatics Group, NERC Centre for Ecology and Hydrology, Wallingford, United Kingdom;* <sup>2</sup>*Center for Informatics and Computing, Ruđer Bošković Institute, Zagreb, Croatia*

**Lunch Break**

**13:30-14:30**

Tuesday Morning, 13<sup>th</sup> November

**Session:** Image Registration and Microscopy Imaging

**Time & Place:** 12:00-13:30 – Diana

**Chairpersons:** Christos Loizou, *Department of Computer Science, Intercollege, Limassol, Cyprus*  
Takis Kasparis, *Department of Electrical Engineering, Computer Engineering & Informatics, Cyprus University of Technology, Limassol, Cyprus*

**Tue. 18.1**

**12:00-12:15**

**Intraoperative Registration of Preoperative 4D Cardiac Anatomy with real-time MR images** \*\*

Xifeng Gao<sup>1</sup>, Nikhil Navkar<sup>1,3</sup>, Dipan Shah<sup>2</sup>, Nikolaos Tsekos<sup>3</sup> and Zhigang Deng<sup>1</sup>

<sup>1</sup>*Computer Graphics and Interactive Media Lab, Department of Computer Science, University of Houston, Houston, USA;* <sup>2</sup>*Methodist DeBakey Heart & Vascular Center, Houston, USA;* <sup>3</sup>*Medical Robotics Lab, Department of Computer Science, University of Houston, Houston, USA*

**Tue. 18.2**

**12:15-12:30**

**Image Guided Mechanically Scanned and Co-registered Localized Optical and MR Spectroscopies** \*\*

Ahmet Sonmez<sup>1</sup>, Andrew Webb<sup>2</sup> and Nikolaos Tsekos<sup>1</sup>

<sup>1</sup>*Medical Robotics Lab, Department of Computer Science, University of Houston, Houston, USA;* <sup>2</sup>*Department of Radiology, Leiden University Medical Center, Leiden, Netherlands*

**Tue. 18.3**

**12:30-12:45**

**Detection and registration of vessels of Fundus and OCT images using curvelet analysis** \*\*

Marzieh Golabbakhsh, Hossein Rabbani and Mahdad Esmaeili

*Biomedical Engineering Department, Medical Image and Signal Processing Research Center, Isfahan University of Medical Sciences, Isfahan, Iran*

**Tue. 18.4**

**12:45-13:00**

**Lateral resolution improvement in Optical Coherence Tomography (OCT) images** \*\*

Evgenia Bousi and Costas Pitris

*KIOS Research Center, Department of Electrical and Computer Engineering, University of Cyprus, Nicosia, Cyprus*

**Tue. 18.5**

**13:00-13:15**

**Atomic Force Microscopy Surface Nanocharacterization of UV-Irradiated Collagen Thin Films** \*\*

Andreas Stylianou, Dido Yova and Konstantinos Politopoulos

*Biomedical Optics & Applied Biophysics Lab, School ECE, Division of Electromagnetics, Electrooptics & Electronic Materials, National Technical University of Athens, Athens, Greece*

**Tue. 18.6**

**13:15-13:30**

**Mechanical Properties of Collagen Fibrils on Thin Films by Atomic Force Microscopy Nanoindentation**

Stylianos-Vasileios Kontomaris, Andreas Stylianos, Dido Yova and Konstantinos Politopoulos

*Biomedical Optics & Applied Biophysics Lab, School ECE Division of Electromagnetics, Electrooptics & Electronic Materials, National Technical University of Athens, Athens, Greece*

**Lunch Break**

**13:30-14:30**



Tuesday Afternoon, 13<sup>th</sup> November

**Session:** Special Session 3<sup>3</sup> – Modeling and Analysis Frameworks

**Time & Place:** 14:30-16:00 – Les Etoiles

**Chairpersons:** Norbert Graf, *University of the Saarland, Department of Pediatric Oncology and Hematology, Homburg, Germany*  
Georgios Mitsis, *Department of Electrical and Computer Engineering, University of Cyprus, Cyprus*

**Tue. SS. 19.1** **14:30-14:45**

**Model-based control of tumor progression** <sup>''</sup>

Marios Hadjiandreou and Georgios Mitsis

*Department of Electrical and Computer Engineering, University of Cyprus, Nicosia, Cyprus*

**Tue. SS. 19.2** **14:45-15:00**

**An innovative mathematical analysis of routine MRI scans in patients with glioblastoma using DoctorEye** <sup>''</sup>

Jonathan Zepp<sup>1</sup>, Norbert Graf<sup>1</sup>, Ioannis Karatzanis<sup>2</sup>, Holger Stenzhorn<sup>1</sup>, Georgios Manikis<sup>2</sup>, Vangelis Sakkalis<sup>2</sup>, Wolfgang Reith<sup>3</sup>, Georgios Stamatakos<sup>4</sup>, Konstantinos Marias<sup>2</sup>

<sup>1</sup>*University of the Saarland, Department of Pediatric Oncology and Hematology, D-66421 Homburg, Germany;* <sup>2</sup>*Institute of Computer Science at FORTH, Heraklion, Crete, Greece;* <sup>3</sup>*University of the Saarland, Department of Neuroradiology, Homburg, Germany;* <sup>4</sup>*Institute of Communications and Computer Systems, National Technical University of Athens, In Silico Oncology Group, Zografos, Greece*

**Tue. SS. 19.3** **15:00-15:15**

**The effects of near optimal growth solutions in genome-scale human cancer metabolic model** <sup>''</sup>

Eleftheria Tzamali, Vangelis Sakkalis and Konstantinos Marias

*Institute of Computer Science, Foundation for Research and Technology-Hellas (FORTH), Heraklion, Crete, Greece*

**Tue. SS. 19.4** **15:15-15:30**

**Analysis of DNA Methylation Epidemiological Data through a Generic Composite Statistical Framework** <sup>'''</sup>

Ioannis Valavanis, Emmanouil Sifakis, Panagiotis Georgiadis, Sotirios Kyrtopoulos and Aristotelis Chatziioannou

*Institute of Biology, Medicinal Chemistry & Biotechnology, National Hellenic Research Foundation, Athens, Greece*

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<sup>3</sup> See Special Session description: *Computational Solutions to Large-scale Data Management and Analysis in Translational and Personalized Medicine*, page xxix.

**Tue. SS. 19.5**

**15:30-15:45**

**Strengths and Weaknesses of the European Concept of Informed Consent: Theoretical Issues and Practical Examples** \*\*

Nikolaus Forgó, Magdalena Goralczyk and Constantin Graf von Rex

*Institute for Legal Informatics, LUH Hannover, Germany*

**Tue. SS. 19.6**

**15:45-16:00**

**The effects of applying cell-suppression and perturbation to aggregated genetic data** \*\*\*

Athos Antoniadēs<sup>1</sup>, John Keane<sup>2</sup>, Aristos Aristodimou<sup>1</sup>, Christa Philipou<sup>1</sup>, Andreas Constantinou<sup>1</sup>, Christos Georgousopoulos<sup>3</sup>, Federica Tozzi<sup>4</sup>, Kyriacos Kyriacou<sup>5</sup>, Andreas Hadjisavvas<sup>5</sup>, Maria Loizidou<sup>5</sup>, Christiana Demetriou<sup>5</sup> and Constantinos Pattichis<sup>1</sup>

<sup>1</sup>*University of Cyprus, Nicosia, Cyprus;* <sup>2</sup>*University of Manchester, Manchester, United Kingdom;* <sup>3</sup>*INTRASOFT International, Luxembourg, Brussels;* <sup>4</sup>*School of Medicine, University of North Carolina, Chapel Hill, NC, USA;* <sup>5</sup>*Cyprus Institute of Neurology and Genetics, Nicosia, Cyprus*

**Coffee Break**

**16:00-16:30**

Tuesday Afternoon, 13<sup>th</sup> November

**Session:** Biological Systems and Models

**Time & Place:** 14:30-16:00 – Minerva

**Chairpersons:** Peter Groumpos, *Dep. of Electrical and Computer Engineering, University of Patras, Greece*  
Panagiotis Bamidis *School of Medicine, Aristotle University of Thessaloniki, Greece*

**Tue. 20.1** 14:30-14:45

**Modeling the Activation of a Non-Homogenous Nerve Fiber by Magnetic Stimulation** \*\*\*

Mihaela Cretu, Laura Darabant and Radu Ciupa

*Technical University of Cluj-Napoca/Electrotechnics Department, Cluj-Napoca, Romania*

**Tue. 20.2** 14:45-15:00

**Modeling of the manuo-ocular coordination during object guiding through a path** \*\*

Saulius Niauronis, Raimondas Zemblys and Vincas Laurutis

*Biomedical engineering center, Siauliai University, Siauliai, Lithuania*

**Tue. 20.3** 15:00-15:15

**Studying the blood plasma flow past a red blood cell, with the mathematical method of Kelvin's transformation** \*\*

Maria Hadjinicolaou and Eleftherios Protopapas

*School of Science and Technology, Hellenic Open University, Patras, Greece*

**Tue. 20.4** 15:15-15:30

**Towards a Graph Theoretical Approach to Study Gender Lateralization Effect in Mathematical Thinking** \*\*

Manousos Klados<sup>1</sup>, Chrysa Lithari<sup>1</sup>, Ioannis Antoniou<sup>2</sup>, Anastasia Semertzidou<sup>1</sup>, Charalampos Bratsas<sup>2</sup>, Sifis Micheloyannis<sup>3</sup> and Panagiotis Bamidis<sup>1</sup>

<sup>1</sup>*Lab of Medical Informatics, School of Medicine, Aristotle University of Thessaloniki, Greece;* <sup>2</sup>*Department of Mathematics, Aristotle University of Thessaloniki, Greece;* <sup>3</sup>*School of Medicine, University of Crete, Greece*

**Tue. 20.5** 15:30-15:45

**Linear Dynamic Modelling and Bayesian Forecasting of Tumor Evolution** \*\*\*

Achilleas Achilleos<sup>1</sup>, Charalambos Loizides<sup>1</sup>, Triantafyllos Stylianopoulos<sup>2</sup> and Georgios Mitsis<sup>1</sup>

<sup>1</sup>*KIOS Research Center for Intelligent Systems and Networks, Department of Electrical and Computer Engineering, University of Cyprus, Nicosia, Cyprus;* <sup>2</sup>*Department of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus*

**Tue. 20.6**

**15:45-16:00**

**A Theoretical Mathematical Modeling of Parkinson's Disease Using Fuzzy Cognitive Maps "**

Peter Groumpos and Antigoni Anninou

*Laboratory for Automation and Robotics, Department of Electrical and Computer Engineering,  
University of Patras, Patra, Greece*

Coffee Break

16:00-16:30

Tuesday Afternoon, 13<sup>th</sup> November

**Session:** Image Analysis 1

**Time & Place:** 14:30-16:00 – Diana

**Chairpersons:** Yang Yang, *NUS Graduate School for Integrative Sciences and Engineering, National University of Singapore & Faculty of Dentistry, National University of Singapore, Singapore*  
Costas Pitris, *Dep. of Electrical and Computer Engineering, University of Cyprus, Cyprus*

**Tue. 21.1**

**14:30-14:45**

**Image-based Estimation of Biomechanical Relationship between Masticatory Muscle Activities and Mandibular Movement** \*\*\*

Yang Yang<sup>1,2</sup>, Kelvin Foong Weng Chiong<sup>1,2</sup>, Ong Sim Heng<sup>1,3,4</sup>, Yagi Masakazu<sup>5</sup> and Takada Kenji<sup>2,6</sup>

<sup>1</sup>*NUS Graduate School for Integrative Sciences and Engineering, National University of Singapore;* <sup>2</sup>*Faculty of Dentistry, National University of Singapore, Singapore;* <sup>3</sup>*Department of Electrical and Computer Engineering, National University of Singapore, Singapore;* <sup>4</sup>*Department of Bioengineering, National University of Singapore, Singapore;* <sup>5</sup>*The Center for Advance Medical Engineering and Informatics, Osaka University, Osaka, Japan;* <sup>6</sup>*Department of Orthodontics and Dentofacial Orthopedics, Graduate School of Dentistry, Osaka University, Osaka, Japan*

**Tue. 21.2**

**14:45-15:00**

**HEp-2 Cells Classification via fusion of morphological and textural features** \*\*\*

Ilias Theodorakopoulos, Dimitris Kastaniotis, George Economou and Spiros Fotopoulos  
*Electronics Laboratory, University of Patras, Patras, Greece*

**Tue. 21.3**

**15:00-15:15**

**Monitoring circulating cancer cells by multichannel in vivo flow cytometry** \*\*\*

Costas Pitsillides<sup>1</sup>, Konstantinos Kapnisis<sup>1</sup>, Andreas Anayiotos<sup>1</sup>, Marianna Prokopi<sup>2</sup> and Christina Kousparou<sup>2</sup>

<sup>1</sup>*Department of Mechanical Engineering and Materials Science and Engineering, Cyprus University of Technology, Nicosia, Cyprus;* <sup>2</sup>*Trojantec Ltd, Bank of Cyprus Oncology Center, Nicosia, Cyprus*

**Tue. 21.4**

**15:15-15:30**

**An Image-based Method for Quantification of Lateral Pterygoid Muscle Deformation** \*\*

Yang Yang<sup>1,2</sup>, Kelvin Foong Weng Chiong<sup>1,2</sup>, Ong Sim Heng<sup>1,3,4</sup>, Yagi Masakazu<sup>5</sup> and Takada Kenji<sup>2,6</sup>

<sup>1</sup>*NUS Graduate School for Integrative Sciences and Engineering, National University of Singapore;* <sup>2</sup>*Faculty of Dentistry, National University of Singapore, Singapore;* <sup>3</sup>*Department of Electrical and Computer Engineering, National University of Singapore, Singapore;* <sup>4</sup>*Department of Bioengineering, National University of Singapore, Singapore;* <sup>5</sup>*The Center for Advance Medical Engineering and Informatics, Osaka University, Osaka, Japan;* <sup>6</sup>*Department of Orthodontics and Dentofacial Orthopedics, Graduate School of Dentistry, Osaka University, Osaka, Japan*

**Tue. 21.5**

**15:30-15:45**

**Adaptive Nonlinear Probabilistic Filter for Positron Emission Tomography** \*\*\*

Musa Alrefaya and Hichem Sahli

*Department of Electronics and Informatics, Vrije Universiteit Brussel, Brussels, Belgium*

**Tue. 21.6**

**15:45-16:00**

**Evaluation of Wound Healing Process Based on Texture Analysis** \*\*\*

Christos Loizou<sup>1,2</sup>, Takis Kasparis<sup>2</sup>, Orthodoxia Mitsi<sup>2</sup> and Michalis Poliviou<sup>3</sup>

*<sup>1</sup>Department of Computer Science, Intercollege, Limassol, Cyprus, <sup>2</sup>Department of Electrical Engineering, Computer Engineering & Informatics, Cyprus University of Technology, Limassol, Cyprus; <sup>3</sup>Poliviou Clinic, Limassol, Cyprus*

**Coffee Break**

**16:00-16:30**

Tuesday Afternoon, 13<sup>th</sup> November

**Session:** Linked2Safety SIG workshop<sup>4</sup>  
**Time & Place:** 16:00-18:00 – Les Etoiles  
**Chairpersons:** Ann Gledson, *University of Manchester, UK*  
Mirto Ioannidi, *ZEINCRO, Greece*

<b>Tue. 22.1</b>	<b>16:00-16:20</b>
<b>Linked2Safety overview: a next-generation, secure linked data medical information space for semantically interconnecting electronic health records and clinical trials systems</b> °	
Christos Georgousopoulos <i>Intrasoft, Greece</i>	
<b>Tue. 22.2</b>	<b>16:20-16:50</b>
<b>Linked2Safety architecture</b> °	
Panagiotis Gouvas <i>UBITECH, Greece</i>	
<b>Tue. 22.3</b>	<b>16:50-17:00</b>
<b>Linked2Safety surveys on current practice in health data access</b> °	
Thomai Stavropoulou <i>ZEINCRO, Greece</i>	
<b>Tue. 22.4</b>	<b>17:00-17:45</b>
<b>Round table discussion/feedback on the Linked2Safety data infrastructure</b> °	
Athos Antoniadis <i>University of Cyprus, Cyprus</i>	
<b>Tue. 22.5</b>	<b>17:45-18:00</b>
<b>Consolidating ideas, next steps and potential collaboration</b> °	
Ann Gledson <i>University of Manchester, UK</i>	
<b>Closing Ceremony – Student Paper Competition Awards</b>	<b>18:00</b>

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<sup>4</sup> See workshop description: *Linked2Safety Clinical Research and Patients Safety Special Interest Group Workshop*, page xxxi.

Tuesday Afternoon, 13<sup>th</sup> November

**Session:** Image Analysis 2

**Time & Place:** 16:00-17:30 – Diana

**Chairpersons:** Christakis Damianou, *Frederick University, Cyprus & MEDSONIC, LTD, Cyprus*  
Andreas Panayides, *Department of Computer Science, University of Cyprus, Cyprus*

**Tue. 23.1** **16:00-16:15**

**IVUS-based Characterization of Atherosclerotic Plaques using Feature Selection and SVM classification** ...

Vasilis Giannoglou, Dimitris Stavrakoudis and John Theocharis

*Department of Electrical and Computer Engineering, Aristotle University of Thessaloniki, Thessaloniki, Greece*

**Tue. 23.2** **16:15-16:30**

**Despeckling in Ultrasound Videos of the Common Carotid Artery** ...

Christos Loizou<sup>1</sup>, Takis Kasparis<sup>2</sup>, Pavlos Christodoulides<sup>2</sup>, Charoula Theofanous<sup>2</sup>, Marios Pantziaris<sup>3</sup>, Efthymoulos Kyriacou<sup>4</sup> and Constantinos Pattichis<sup>5</sup>

<sup>1</sup>*Departement of Computer Science, Intercollege, Limassol, Cyprus;* <sup>2</sup>*Departement of Electrical Engineering, Computer Engineering & Informatics, Cyprus University of Technology, Limassol, Cyprus;* <sup>3</sup>*Institute of Neurology and Genetics, Nicosia, Cyprus;* <sup>4</sup>*Frederick University, Department of Computer Science, Limassol, Cyprus;* <sup>5</sup>*Departement of Computer Science, University of Cyprus, Nicosia, Cyprus*

**Tue. 23.3** **16:30-16:45**

**Head Posture Influences the Geometric and Hemodynamic Features on the Healthy Human Carotid Bifurcation** ...

Nicolas Aristokleous<sup>1</sup>, Ioannis Seimenis<sup>2</sup>, Yannis Papaharilaou<sup>3</sup>, Mohammad Iman Khozaymeh<sup>1</sup>, Georgios Georgiou<sup>4</sup>, Brigitta Brott<sup>5</sup>, Andreas Anayiotos<sup>1</sup>

<sup>1</sup>*Department of Mechanical Engineering and Materials Science and Engineering, Cyprus University of Technology Limassol, Cyprus;* <sup>2</sup>*Department of Medicine Democritus, University of Thrace Alexandroupolis, Greece;* <sup>3</sup>*Institute of Applied and Computational Mathematics Foundation for Research and Technology-Hellas Heraklion, Creten, Greece;* <sup>4</sup>*Department of Mathematics and Statistics, University of Cyprus Nicosia, Cyprus;* <sup>5</sup>*Department of Medicine, University of Alabama at Birmingham, Birmingham, USA*

**Tue. 23.4** **16:45-17:00**

**Combination of different texture features for mammographic density classification** ...

Gregoris Liasis<sup>1</sup>, Constantinos Pattichis<sup>2</sup> and Styliani Petroudi<sup>2</sup>



<sup>1</sup>Department of Information and Communication Systems, Open University of Cyprus, Nicosia, Cyprus; <sup>2</sup>Department of Computer Science, University of Cyprus, Nicosia, Cyprus

**Tue. 23.5**

**17:00-17:15**

**A configurable system for role-specific video imaging during laparoscopic surgery** ..

Yuebing Jiang<sup>1</sup>, Timothy Perez<sup>2</sup>, Marios Pattichis<sup>1</sup>, and Bilal Khan<sup>2</sup>

<sup>1</sup>Department of ECE, University of New Mexico, Albuquerque, USA; <sup>2</sup>Department of Surgery, University of New Mexico, Albuquerque, USA

**Tue. 23.6**

**17:15-17:30**

**An Adaptive Multiscale AM-FM Texture Analysis System with Application to Hysteroscopy Imaging** ...

Ioannis Constantinou<sup>1</sup>, Marios Pattichis<sup>2</sup>, Vasilis Tanos<sup>3</sup>, Marios Neofytou<sup>1</sup> and Constantinos Pattichis<sup>1</sup>

<sup>1</sup>Department of Computer Science, University of Cyprus, Nicosia, Cyprus; <sup>2</sup>Department of ECE, University of New Mexico, Albuquerque, USA; <sup>3</sup>Aretaeion Medical Center, Nicosia, Cyprus

**Closing Ceremony – Student Paper Competition Awards**

**18:00**

Tuesday Afternoon, 13<sup>th</sup> November

**Session:** Closing Ceremony – Student Paper Competition Awards

**Time & Place:** 18:00-18:15 – Les Etoiles

**Chairpersons:** Constantinos S. Pattichis, *University of Cyprus, Cyprus*  
Nicolas Bourbakis, *BIBE Founding Steering Committee Chair*

**Tue. 24.1** **18:00-18:10**

**Student Paper Competition Awards**

**Styliani Petroudi, *Department of Computer Science, University of Cyprus, Cyprus***

**Ilias Maglogiannis, *Department of Computer Science and Biomedical Informatics, University of Central Greece***

**Tue. 24.2** **18:10-18:15**

**Concluding Remarks**

**Constantinos S. Pattichis, *Department of Computer Science, University of Cyprus, Cyprus***

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

**Cypriot Souvlaki Dinner** **19:15**