Preface

Artificial Intelligence is a branch of computer science, continuously and rapidly evolving. It is a fact that more and more sophisticated modeling techniques are published in the literature all the time, capable of tackling complicated and challenging problems. Artificial Neural Networks (ANN) and other Soft Computing approaches seek inspiration from the world of biology to enable the development of real-world intelligent systems.

It is a fact that EANN is a well-established event with a very long and successful history. Eighteen years have passed since the first organization in Otaniemi Finland, in 1995. For the following years it has a continuous and dynamic presence as a major European scientific event. An important milestone is year 2009, when its guidance by a steering committee of the INNS (EANN Special Interest Group) was initiated. Thus, from that moment the conference has been continuously supported technically, by the International Neural Network Society (INNS).

This volume contains the papers that were accepted to be presented orally at the 14th EANN conference and its satellite workshops. This volume belongs to the CCIS Springer Series. The event was held (13th-16th of September) in the “Athina Pallas” Resort and Conference center in Halkidiki, Greece and was supported by the Aristotle University of Thessaloniki and the Democritus University of Thrace.

Three workshops on timely AI subjects were organized successfully and collocated with EANN-2013:

1. the 2nd Mining Humanistic Data (MHD) Workshop supported by the Ionian University and the University of Patras. We wish to express our gratitude to Professors Spyros Sioutas and Christos Makris for their common effort towards the organization of the 2nd MHD Workshop. Also we would like to thank Professors Vassilios Verykios of the Hellenic Open University, Greece and Evaggelia Pitoura of the University of Ioannina, Greece, for their keynote lectures in the MHD workshop.

2. the 3rd Computational Intelligence Applications in Bioinformatics (CIAB) Workshop supported by the University of Patras. We are grateful to Professor Spyros Likothanasis for his kind efforts towards the management of the CIAB Workshop and for his keynote lecture in the frame of this event.

3. the 1st Innovative European Policies and Applied Measures for Developing Smart Cities (IPMSC) Workshop, supported by the Hellenic Telecommunications Organization. The IPMSC was driven by the hard work of Drs. Ioannis P. Chochoiliouros and Ioannis M. Stephanakis (Hellenic Telecommunications Organization - OTE, Greece).

Three Keynote Speakers, Professors Nikola Kasabov, Erkki Oja, and Marios Polycarpou, were invited and they gave lectures in timely aspects of AI and ANN. Finally, an highly interesting tutorial entitled “Neural Networks for Digital Media Analysis and Description” was delivered by Assistant Professor Anastasios Tefas of the Aristotle University of Thessaloniki Greece. We wish to express our sincere thanks to our invited keynote speakers and Assistant Professor Tefas.
The diverse nature of papers presented, demonstrates the vitality of neural computing and related soft computing approaches and proves the very wide range of ANN applications as well. On the other hand, this volume contains basic research papers, presenting variations and extensions of several approaches.

The Organizing Committee was delighted by the overwhelming response to the call for papers. All papers have passed through a peer review process by at least 2 independent academic referees. Where needed a third referee was consulted to resolve any conflicts. Overall 40% of the submitted manuscripts (totally 91) were accepted to be presented in the EANN and in the three satellite workshops. The accepted papers of the 8th AIAI conference are related to the following thematic topics:

- Evolutionary Algorithms
- Adaptive Algorithms
- Control Approaches
- Soft Computing Applications
- ANN
- Ensembles
- Bioinformatics
- Classification
- Pattern Recognition
- Medical Applications of AI
- Fuzzy Inference
- Filtering
- SOM
- Image – Video Analysis
- Social Media Applications
- Community based Governance
- Medical Applications of AI
- Fuzzy Inference
- Filtering
- SOM
- Image – Video Analysis
- Social Media Applications
- Community based Governance

The authors came from 28 different countries from all over Europe (e.g. Austria, Bulgaria, Cyprus, Czech Republic, Finland, France, Germany, Greece, Holland, Italy, Poland, Portugal, Slovakia, Slovenia, Spain, UK, Ukraine, Russia, Romania, Serbia), Americas (e.g. Brazil, USA, Mexico), Asia (e.g., China, India, Iran, Pakistan), Africa (e.g. Egypt, Tunisia, Algeria) and Oceania (New Zealand).

We hope that these proceedings will help researchers worldwide to understand and to be aware of new ANN aspects. We do believe that they will be of major interest for scientists over the globe and that they will stimulate further research in the domain of Artificial Neural Networks and AI in general.

September 2013
Lazaros Iliadis, Harris Papadopoulos, Chrisina Jayne
Program Committee

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- Shigang Yue, University of Lincoln, UK
- Achilles Zapranis, University of Macedonia, Greece
- Rodolfo Zunino, University of Genova, Italy
The talk presents a brief overview of contemporary methods for neurocomputing, including: evolving connection systems (eSNN) and evolving neuro-fuzzy systems [1]; evolving spiking neural networks (eSNN) [2-5]; evolutionary and neurogenetic systems [6]; quantum inspired evolutionary computation [7,8]; rule extraction from eSNN [9]. These methods are suitable for incremental adaptive, on-line learning from spatio-temporal data and for data mining. But the main focus of the talk is how they can learn to predict early the outcome of an input spatio-temporal pattern, before the whole pattern is entered in a system. This is demonstrated on several applications in bioinformatics, such as stroke occurrence prediction, and brain data modeling for brain-computer interfaces [10], on ecological and environmental modeling [11].

eSNN have proved superior for spatio-and spectro-temporal data analysis, modeling, pattern recognition and early event prediction as outcome of recognized patterns when partially presented. Future directions are discussed. Materials related to the lecture, such as papers, data and software systems can be found from www.kedri.aut.ac.nz and also from: www.thenuecom.com and http://ncs.ethz.ch/projects/evospike/.

References


Tutorial

Dr Anastasios Tefas

Anastasios Tefas received the B.Sc. in informatics in 1997 and the Ph.D. degree in informatics in 2002, both from the Aristotle University of Thessaloniki, Greece. Since 2013 he has been an Assistant Professor at the Department of Informatics, Aristotle University of Thessaloniki. From 2008 to 2012, he was a Lecturer at the same University. From 2006 to 2008, he was an Assistant Professor at the Department of Information Management, Technological Educational Institute of Kavala. Dr. Tefas participated in 12 research projects financed by national and European funds. He has co-authored 34 journal papers, 100 papers in international conferences and contributed 7 chapters to edited books in his area of expertise. Over 1900 citations have been recorded to his publications and his H-index is 21 according to Google scholar. His current research interests include computational intelligence, pattern recognition, statistical machine learning, digital signal and image processing and computer vision, biometrics and security.

Neural Networks for Digital Media Analysis and Description

Friday, September 13
11:55 - 12:55

Recent advances in technological equipment, like digital cameras, smart-phones, etc., have led to an increase of the available digital media, e.g., videos, captured every day. Moreover, the amount of data captured for professional media production (e.g., movies, special effects, etc) has dramatically increased and diversified using multiple sensors (e.g., 3D scanners, multi-view cameras, very high quality images, motion capture, etc), justifying the digital media analysis as a big data analysis problem. As expected, most of these data are acquired in order to describe human presence and activity and are exploited either for monitoring (visual surveillance and security) or for personal use and entertainment. Basic problems in human centered media analysis are face recognition, facial expression recognition and human activity recognition. According to YouTube statistics http://www.youtube.com/yt/press/statistics.html, 100 hours of video are uploaded by the users every minute. Such a data growth, as well as the importance of visual information in many applications, has necessitated the creation of methods capable of automatic processing and decision making when necessary. This is why a large amount of research has been devoted in the analysis and description of digital media in the last two decades.

In this tutorial a short overview on recent research efforts for digital media analysis and description using neural networks will be given. Neural networks are very powerful in analyzing, representing and classifying digital media content through various architectures and learning algorithms. Both unsupervised and supervised algorithms can be used for digital media feature extraction. Digital media representation can be done either in a synaptic level or at the output level. The specific problem that will be used as a case study for digital media analysis is the human-centered video analysis for activity and identity recognition. Several neural network topologies, such as self organizing maps, independent subspace analysis, multi-layer perceptrons, extreme learning machines and deep learning architectures will be presented and results on human activity recognition will be reported.

Distributed Sensor Fault Diagnosis in Big Data Environments

Friday, September 13
10:30 - 11:30

The emergence of networked embedded systems and sensor/actuator networks has given rise to advanced monitoring and control applications, where a large amount of sensor data is collected and processed in real-time in order to achieve smooth and efficient operation of the underlying system. The current trend is towards larger and larger sensor data sets, leading to so called big data environments. However, in situations where faults arise in one or more of the sensing devices, this may lead to a serious degradation in performance or even to an overall system failure. The goal of this presentation is to motivate the need for fault diagnosis in complex distributed dynamical systems and to provide a methodology for detecting and isolating multiple sensor faults in a class of nonlinear dynamical systems. The detection of faults in sensor groups is conducted using robust analytical redundancy relations, formulated by structured residuals and adaptive thresholds. Various estimation algorithms will be presented and illustrated, and directions for future research will be discussed.
Workshops

2nd Mining Humanistic Data Workshop
MHDW 2013

Program chairs:
Spyros Sioutas, Ionian University, Greece
Christos Makris, University of Patras, Greece
Achilleas Kameas, Hellenic Open University, Greece
Katia Lida Kermanidis, Ionian University, Greece
Giannis Tzimas, TEI of Messolonghi, Greece

Aim
The abundance of available data that is retrieved from or is related to the areas of Humanities and the human condition challenges the research community in processing and analyzing it. The aim is two-fold: on the one hand, to extract knowledge that will help understand human behavior, creativity, way of thinking, reasoning, learning, decision making, socializing and even biological processes; on the other hand, to exploit the extracted knowledge by incorporating it into intelligent systems that will support humans in their everyday activities.

The nature of humanistic data can be multimodal, semantically heterogeneous, dynamic, time and space-dependent, and highly complicated. Translating humanistic information, e.g. behavior, state of mind, artistic creation, linguistic utterance, learning and genomic information into numerical or categorical low-level data is a significant challenge on its own. New techniques, appropriate to deal with this type of data, need to be proposed and existing ones adapted to its special characteristics.

The workshop aims to bring together interdisciplinary approaches that focus on the application of innovative as well as existing data matching, fusion and mining and knowledge discovery and management techniques (like decision rules, decision trees, association rules, ontologies and alignments, clustering, filtering, learning, classifier systems, neural networks, support vector machines, preprocessing, post processing, feature selection, visualization techniques) to data derived from all areas of Humanistic Sciences, e.g. linguistic, historical, behavioral, psychological, artistic, musical, educational, social etc., Ubiquitous Computing and Bioinformatics.

Ubiquitous Computing applications (aka Pervasive Computing, Mobile Computing, Ambient Intelligence, etc.) collect large volumes of usually heterogeneous data in order to effect adaptation, learning and in general context awareness. Data matching, fusion and mining techniques are necessary to ensure human centred application functionality.

An important aspect of humanistics centers around managing, processing and computationally analyzing Biological and Biomedical data. Hence, one of the aims of this workshop will be to also attract researchers that are interested in designing, developing and applying efficient data and text mining techniques for discovering the underlying knowledge existing in Biomedical data, such as sequences, gene expressions and pathways.

Workshop Topics
The workshop topics include but are not limited to:

- Humanistic Data Collection and Interpretation
- Data pre-processing
- Feature Selection
- Supervised learning of humanistic knowledge
- Clustering
- Fuzzy modeling
- Heterogeneous data fusion
- Knowledge Representation and Reasoning
- Linguistic Data Mining
- Historical Research
- Educational Data Mining
- Music Information Retrieval
- Data-driven Profiling/Personalization
- User Modeling
- Behavior Prediction
- Recommender Systems
- Web Sentiment Analysis
- Social Data Mining
- Visualization techniques
- Integration of data mining results into real-world applications with humanistic context
- Ontologies, ontology matching and alignment
- Mining Humanistic Data in the Cloud
- Game Data Mining
- Virtual-World Data Mining
- Speech and Audio Data Processing
- Data Mining Techniques for Knowledge Discovery
- Biomedical Data Mining
- Protein structure prediction
Bioinformatics is the field of science in which Biology, Computer Science, and information technology merge to form a single discipline. The ultimate goal of the field is to enable the discovery of new biological insights as well as to create a global perspective from which unifying principles in Biology can be discerned. The analysis and interpretation of biological data is an extremely hard task due to their complexity, size and noisy nature. Recent applications of Computational Intelligence (CI) in this area suggest that they are well-suited to this area of research. This workshop will highlight applications of CI to a broad range of topics. Particular interest will be directed towards novel applications of CI approaches to problems in these areas.

Computational Intelligence, a sub-branch of Artificial Intelligence, studies, mostly nature inspired, adaptive mechanisms to facilitate intelligent behavior in complex and changing environments. Some of the most important CI representative methods are: Artificial Neural Networks, Evolutionary Algorithms, Swarm Intelligence, Artificial Immune Systems, Ant-colony Optimization, and Fuzzy Systems. Individual techniques from these CI paradigms, as well as hybridizations between CI approaches, have been applied successfully to solve Applied Biology, Bioinformatics and Molecular Biology problems.

The aim of CIAB2013 (prlab.ceid.upatras.gr/CIAB2013/) workshop is to serve as an interdisciplinary forum for bringing together specialists and to deal with problems from the field of Biology, Bioinformatics, Computational Biology, Chemical Informatics, and Bioengineering. Issues related to the theory of Computational Intelligence techniques, as well as applications in Bioinformatics and Computational Biology will be addressed in this workshop in order to motivate research in new trend-setting directions. This is the third year of the existence of the CIAB2013 workshop. CIAB2011 took place in Corfu, Greece, 15-18 September, 2011 at the 12th EANN/7th AIAI Joint Conference (http://delab.csd.auth.gr/eann2011/) and CIAB2012 in London, United Kingdom, 20-23 September, 2012 at the 13th EANN Conference.

CIAB2013 welcomes paper submissions introducing and implementing Computational Intelligent techniques to address various problems in Bioinformatics and Computational Biology. Our aim is to bring together researchers, engineers, developers and practitioners from academia to industry working in multi-disciplinary area and technically converging areas. Topics of interest include, but are not limited to:

- Systems Biology
- Molecular Sequence Alignment and Analysis
- RNA and protein folding and structure prediction
- Gene expression analysis from microarrays
- Protein-Protein interactions
- Biological Networks
- Biological Processes
- Biological and Medical Ontologies
- Computational Proteomics and Genomics
- In-silico Optimization of Biological Systems
- High-Throughput Data Analysis (microarrays, mass spectrometry, EST, NGS etc.)
- Analysis of Large Biological Data Sets
- Medical Image Analysis and Pattern Recognition

Bioinformatics is the field of science in which Biology, Computer Science, and information technology merge to form a single discipline. The ultimate goal of the field is to enable the discovery of new biological insights as well as to create a global perspective from which unifying principles in Biology can be discerned. The analysis and interpretation of biological data is an extremely hard task due to their complexity, size and noisy nature. Recent applications of Computational Intelligence (CI) in this area suggest that they are well-suited to this area of research. This workshop will highlight applications of CI to a broad range of topics. Particular interest will be directed towards novel applications of CI approaches to problems in these areas.

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The Workshop has been established to disseminate knowledge obtained from EU projects and funded research in the area of Smart Cities as well as original technical reports/deliverables from related pilots and intelligent telecom applications such as the LiveCity Project (Grant Agreement No.297291) and the Social&Smart Project (Grant Agreement No.317947). Other similar projects from the same thematic category are expected to join the current workshop. Papers from industry and academia covering EU policies regarding smart cities in the following areas are encouraged:

- **European Union policies and regulatory issues, business aspects and related market practices**
  Economics for Next-Generation-Networks; business trends; cost models and service pricing; access regulation and migration strategies; regulatory challenges and assessment of related applied legal measures; strategic challenges and current European initiatives for research and innovation in the context of smart cities; experimental results from specific research platforms and of related pilots (i.e.: Living Labs); societal and environmental aspects of proposed corresponding solutions; future plans for new use cases, test beds and local initiatives within the scope of an Internet-based modern society; other Internet-based urban ecosystems.

- **Smart cities applications, strategies and business models; application scenarios in the areas of eGovernment, Emergency Services, eHealth, Education and City Experiences; service evaluation and service delivery**
  Service-Oriented Architecture (SOA); service business models for smart cities and e-government diffusion; service design, service deployment and service delivery; QoS-related aspects; knowledge-intensive services; risk management in services management; specific applications in the areas of Emergency services, eHealth, Education and City Experiences.

- **Internet of the things, ubiquitous and pervasive services - Applications and interaction for social networking**
  Future technologies bridging the physical and virtual worlds; Internet-based ecosystems; Internet services and applications, home area networks, smart home, personal area networks; impacts on the security, privacy and risks on the physical world.

- **AI applications and agents in telecommunications**
  Service-oriented agent-based architectures, protocols and deployment environments; multi-agent planning uses; swarm intelligence and ant colony optimization models.

- **Cloud computing, grid computing and virtualization**
  Architectures, resource management and protocols, M2M (machine-to-machine) interaction/SDNs and cloud telematics, brokering.

- **Video-to-video and other multimedia-based communications, IPv6 and mobile networks**
  IPv6 protocol and next generation networks; HEVC and H.264/MPEG-4 AVC; mobile TV, multimedia delivery and LTE/Long Term Evolution; Rate-distortion control in heterogeneous networks; Multi-point-to-Multi-point delivery; interactive advertisement; IPTV and IMS; 3D Internet and 3D TV; immersive multimedia; enhanced and augmented reality; virtualization.
### Program at a glance

#### Friday 13/09/13

- **09:30-10:30**: Registration
- **10:30-11:30**: Invited talk by Professor Marios Polycarpou
- **11:30-12:00**: Coffee Break
- **12:00-13:00**: Tutorial by Dr Anastasios Tefas
- **13:00-14:00**: Session 1 (PR-PRED) + Session 2 (SCA 1)
- **14:00-15:00**: Lunch
- **15:00-16:00**: Workshop CIAB 1 + Session 3 (MEDA)
- **16:00-16:20**: Coffee Break
- **16:20-17:20**: Workshop MHD 1 + Workshop CIAB 2
- **17:20-18:20**: Workshop MHD 2 + Workshop IPMSC 1

#### Saturday 14/09/13

- **09:30-10:00**: Registration
- **10:00-11:00**: Session 4 (FUZ) + Workshop IPMSC 2
- **11:00-11:20**: Coffee Break
- **11:20-12:40**: Session 5 (EVOLA) + Session 6 (SCA 2)
- **12:40-13:40**: Workshop MHD 3 + Session 7 (CNNN)
- **13:40-14:40**: Lunch
- **14:40-16:00**: Workshop MHD 4 + Session 8 (SOM-RBF)
- **16:00-16:20**: Coffee Break
- **16:20-17:20**: Session 9 (CTAAI) + Session 10 (IVA 1)
- **17:30-18:30**: Invited talk by Professor Erkki Oja

#### Sunday 15/09/13

- **09:30-10:30**: Registration
- **10:30-11:00**: Invited talk by Professor Nikola Kasabov
- **11:00-12:30**: Session 11 (IVA 2) + Session 12 (CPR)
- **12:30-13:00**: Coffee Break
- **13:00-14:00**: Session 13 (SOC-MED) + Workshop MHD 5
- **14:00-15:00**: Lunch
- **15:00-16:00**: Workshop CIAB 3 + Workshop MHD 6
- **16:00-16:20**: Coffee Break
- **16:20-17:30**: Session 14 (MEDA 2) + Workshop MHD 7
- **17:30-18:30**: Session 15 (LEARN)
- **18:30-18:45**: Closing Session

#### Thursday 12/09/2013

- **20:30**: Welcome Reception

#### Monday 16/09/13

- **20:30**: Gala Dinner
- **09:00-17:00**: Mount Athos Cruise
Detailed Program

Thursday 12/9/2013

Welcome Reception (at Athena Pallas Village) 20:30

Friday 13/9/2013

Registration (at Athena Pallas Village) 9:30-10:30

Welcome message by Professor Lazaros Iliadis

Keynote Lecture 1
Professor Marios Polycarpou
Distributed Sensor Fault Diagnosis in Big Data Environments
Chair: Ilias Maglogiannis

Plenary Session 1 10:30-11:30

COFFEE BREAK 11:30-12:00

Tutorial 1
Assistant Professor Anastasios Tefas
Neural Networks for Digital Media Analysis and Description presentation
Chair: Marios Polycarpou

Plenary Session 2 12:00-13:00

EANN Session 1: PR-PRED
Pattern Recognition-Predictors
Chair: Konstantinos Margaritis

13:00-14:00

Feature Comparison and Feature Fusion for Traditional Dances Recognition
Ioannis Kapsouras, Stylianos Karanikolos, Nikos Nikolaidis and Anastasios Tefas

Intelligent Chair Sensor - Classification of Sitting Posture
Leonardo Martins, Rui Lucena, Joao Belo, Marcelo Santos, Claudia Quaresma, Adelaide Jesus and Pedro Vieira

EANN Session 2: SCA1
Soft Computing Applications 1
Chair: Lazaros Iliadis

Study of Influence of Grouping Type and the Number of Simultaneously Determined Parameters on the Error of Neural Network Solution in the Inverse Problem of Electrical Prospecting
Sergey Dolenko, Igor Isaev, Eugeny Obornev, Igor Persiantsev and Mikhail Shimelevich

Prediction of Foreign Currency Exchange Rates Using CGPANN
Durre Nayab, Gul Muhammad Khan and Sahibzada Ali Mahmud

Coastal Hurricane Inundation Prediction for Emergency Response Using Artificial Neural Networks
Bernard Hsieh and Jay Ratcliff

LUNCH 14:00-15:00

Workshop: CIAB1
Computational Intelligence Applications in Bioinformatics

Keynote Lecture
Professor Spyros Likothanasis
Application of Computational Intelligence Techniques in Systems’ Biology
Chair: Christos Makris

15:00-16:00

EANN Session 3: MEDA
Medical Applications of AI
Chair: Harris Papadopoulos

An Immune-Inspired Approach for Breast Cancer Classification
Rima Daoudi, Khalifa Djemal and Abdelkader Benyettou

Classification of Arrhythmia Types Using Cartesian Genetic Programming Evolved Artificial Neural Networks
Masood Ahmad Arbab, Gul Muhammad Khan and Sahibzada Ali Mahmud
### Workshop: MHD2
**Mining Humanistic Data**
**Chair:** Giannis Tzimas
**17:20-18:20**

**Evaluating Sentiment in Annual Reports for Financial Distress Prediction using Neural Networks and Support Vector Machines**
Petr Hajek and Vladimir Olej

**Identification of all Exact and Approximate Inverted Repeats in Regular and Weighted Sequences**
Carl Barton, Costas S. Iliopoulos, Nicola Mulder and Bruce Watson

**Query Expansion through On-line Social Microblogging Services**
Ioannis Anagnostopoulos, Gerasimos Razis, Phivos Mylonas and Christos-Nikolaos Anagnostopoulos

**Recognizing Emotion Presence in Natural Language Sentences**
Isidoros Perikos and Ioannis Hatzilygeroudis

### Workshop: IPMSC1
**Innovative European Policies and Applied Measures for Developing Smart Cities**
**Chair:** Ioannis Chochliouros
**17:20-18:20**

**A Particle Swarm Optimization (PSO) Model for Scheduling Nonlinear Multimedia Services in Multicommodity Fat-tree Cloud Networks**
Ioannis M. Stephanakis, Ioannis P. Chochliouros, George Caridakis and Stefanos Kollias

**Social and Smart: Towards an Instance of Subconscious Social Intelligence**

**Creative Rings for Smart Cities**
Simon Delaere, Pieter Ballon, Peter Mechant, Giorgio Parladori, Dirk Osstyn, Merce Lopez, Fabio Antonelli, Sven Maltha, Makis Stamatelatos, Ana Garcia and Artur Serra

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### Workshop: CIAB2
**Computational Intelligence Applications in Bioinformatics**
**Chair:** Konstantinos Theofilatos
**16:20-17:20**

**Enhanced Weighted Restricted Neighborhood Search Clustering: A Novel Algorithm for Detecting Human Protein Complexes from Weighted Protein-Protein Interaction Graphs**
Christos Dimitrakopoulos, Konstantinos Theofilatos, Andreas Pegkas, Spiros Likothanassis and Seferina Mavroudi

**A Hybrid Approach to Feature Ranking for Microarray Data Classification**
Dusan Popovic, Alejandro Sifrim, Charalampos Moschopoulos, Yves Moreau and Bart De Moor

**Derivation of Cancer Related Biomarkers from DNA Methylation Data from an Italian Epidemiological Cohort**
Ioannis Valavanis, Emmanouil Sifakis, Panagiotiis Georgriadiis, Soterios Kyrtopoulos and Aristotelis Chatziioannou

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**COFFEE BREAK 16:00-16:20**

**Workshop: MHD1**
**Mining Humanistic Data**
**Chair:** Spyros Sioutas

**16:00-16:20**

**Keynote Lecture 1**
Associate Professor Vassilios Verykios

**Knowledge Hiding in Data Mining**
Chair: Spyros Sioutas
Saturday 14/9/2013

EANN Session 4: FUZ
Fuzzy Inference
Chair: Peter Hajek

Temperature Forecasting in the Concept of Weather Derivatives: A Comparison between Wavelet Networks and Genetic Programming
Antonis Alexandridis and Michael Kampouridis

MPEG-4 Internet Traffic Estimation Using Recurrent CGPANN
Gul Muhammad Khan, Fahad Ullah and Sahibzada Ali Mahmud

SCH-EGA: An Efficient Hybrid Algorithm for the Frequency Assignment Problem
Shaohui Wu, Gang Yang, Jieping Xu and Xirong Li

Improving the RACAI Neural Network MSD Tagger
Tiberiu Boros and Stefan Daniel Dumitrescu

EANN Session 5: EVOLA
Evolutionary Algorithms
Chair: Spyros Likothanasis

Temperature Forecasting in the Concept of Weather Derivatives: A Comparison between Wavelet Networks and Genetic Programming
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EANN Session 6: SCA2
Soft Computing Applications 2
Chair: Ioannis Hatzilygeroudis

Crossroad Detection Using Artificial Neural Networks
Alberto Hata, Danilo Habermann, Denis Wolf and Fernando Osorio

Application of Particle Swarm Optimization Algorithm to Neural Network Training Process in the Localization of the Mobile Terminal
Jan Karwowski, Michal Okulewicz and Jaroslaw Legierski

Modeling spatiotemporal wild fire data with Support Vector Machines and Artificial Neural Networks
Georgios Karapilafis, Lazaros Iliadis, Stephanos Spartalis, Stefanos Katsavounis and Elias Pimenidis

Prediction of Surface Texture Characteristics in Turning of FRPs using ANN
Stefanos Karagiannis, Vassilis Iakovakis, John Kechagias, Nikos Fountas and Nikolaos Vaxevanidis
Workshop: MHD3

Mining Humanistic Data

Keynote Lecture 2
Professor Evaggelia Pitoura

POIKILO: Models, Algorithms and Tools for Result Diversification
Chair: Spyros Sioutas

EANN Session 7: CNNN
Classification - Novel ANN architectures
Chair: Katia Kermanidou

Towards a Wearable Coach: Classifying Sports Activities with Reservoir Computing
Stefan Schliebs, Nikola Kasabov, Doug Hunt and Dave Parry

Real-Time Psychophysiological Emotional State Estimation in Digital Gameplay Scenarios
Pedro Nogueira, Rui Rodrigues and Eugenio Oliveira

Novel Neural Architecture for Air Data Angle Estimation
Manuela Battipede, Mario Cassaro, Piero Gili and Angelo Lerro

LUNCH 13:40-14:40

Workshop: MHD4

Mining Humanistic Data
Chair: Evaggelia Pitoura

Classification of Event Related Potentials of Error-Related Observations Using Support Vector Machines
Pantelis Asvestas, Errikos Ventouras, Irene Karanasiou and George Matsopoulos

A Novel Hierarchical Approach to Ranking Based Collaborative Filtering
Athanassios N. Nikolakopoulos, Marianna Kouneli and John Garofalakis

Mimicking Real Users’ Interactions on Web Videos through a Controlled Experiment
Antonia Spiridonidou, Ioannis Karydis and Markos Avlonitis

EANN Session 8: SOM-RBF
Learning and Data Mining 2
Chair: Konstantinos Margaritis

A Parallel and Hierarchical Markovian RBF Neural Network: Preliminary Performance Evaluation
Yiannis Kokkinos and Konstantinos Margaritis

Data Mining and Modelling for Wave Power Applications Using Hybrid SOM-NG Algorithm
Maria J. Crespo-Ramos, Ivan Machon-Gonzalez, Hilario Lopez-Garcia and Jose Luis Calvo Rolle

Automatic Detection of Different Harvesting Stages in Lettuce Plants by Using Chlorophyll Fluorescence Kinetics and Supervised Self Organizing Maps (SOMs)
Xanthoula Eirini Pantazi, Dimitrios Moshou, Dimitrios Kasampalis, Pavlos Tsouvaltas and Dimitrios Kateris

Analysis of Heating Systems in Buildings Using Self-Organizing Maps
Pablo Barrientos, Carlos J. Del Canto, Antonio Moran, Serafin Alonso, Miguel A. Prada, Juan J. Fuertes and Manuel Dominguez

COFFEE BREAK 16:00-16:20

EANN Session 9: CTAAI
Control Techniques-Aspects of AI evolution
Chair: Mario Malcangni

Neural Network Simulation of Photosynthetic Production
Tibor Kmet and Maria Kmetova
A Novel Artificial Neural Network based Space Vector Modulated DTC and its Comparison with other Artificial Intelligence (AI) Control Techniques
Sadhana Jadhav and B Chaudhari

Thinking Machines versus Thinking Organisms
Petro Gopych

EANN Session 10: IVA1
Image – Video Analysis 1
Chair: Anastasios Tefas
IMMI: Interactive Segmentation Toolkit
Jan Masek, Radim Burget and Vaclav Uher
Learning Accurate Active Contours
Adas Gelzinis, Antanas Verikas, Marija Bacauskiene and Evaldas Vaiciukynas
Local Binary Patterns and Neural Networks for No-Reference Image and Video Quality Assessment
Marko Panic, Dubravko Culibrk, Srdjan Sladojevic and Vladimir Crnojevic

Keynote Lecture 2
Professor Erkki Oja
Machine Learning for Big Data Analytics
Chair: Nikola Kasabov

Gala Dinner

Sunday 15/9/2013

Registration
9:30-10:30

Keynote Lecture 3
Professor Nikola Kasabov
Neurocomputing for Spatio/Spectro-Temporal Pattern Recognition and Early Event Prediction: Methods, Systems, Applications
Chair: Erkki Oja

EANN Session 11: IVA2
Image – Video Analysis 2
Chair: Adas Gelzinis
Pattern Recognition in Thermal Images of Plants Pine Using Artificial Neural Networks
Adimara Bentivoglio Colturato, Andre Gomes Benjamin, Daniel Fernando Pigatto, Danielle Bentivoglio Colturato, Alex Sandro Roschilda Pinto, Luiz Henrique Castelo Branco, Edson Luiz Furtado and Kalinka Regina Lucas Jaquie Castelo Branco
Direct Multi-label Linear Discriminant Analysis
Maria Oikonomou and Anastasios Tefas
Image Restoration Method by Total Variation Minimization Using Multilayer Neural Networks Approach
Mohammed Debakla, Khalifa Djemal and Mohamed Benyettou

EANN Session 12: CPR
Classification – Pattern Recognition
Chair: Aristeidis Tsitiridis
Hierarchical Object Recognition Model of Increased Invariance
Aristeidis Tsitiridis, Ben Mora and Mark Richardson
Detection of Damage in Composite Materials Using Classification and Novelty Detection Methods
Ramin Amali and Bradley Hughes
Impact of Over and Under Sampling on Neural Network Classification Performance in the Context of Repeat Movie Viewing
Elena Fitkov-Norris and Sakinat Oluwabukonla Folorunso

Discovery of Weather Forecast Web Resources Based on Ontology and Content-driven Hierarchical Classification
Anastasia Mountzidou, Stefanos Vrochidis and Ioannis Kompatsiaris

COFFEE BREAK

EANN Session 13: SOC-MED
Social Media – Community Based Governance
Chair: Manolis Maragoudakis

Social Media – Community Based Governance

13:00-14:00

On Mining Opinions from Social Media
Vicky Politopoulou and Manolis Maragoudakis

On the Quantification of Missing Value Impact on Voting Advice Applications
Marilena Agathokleous, Nicolas Tsapatsoulis and Ioannis Kakisis

Automata on Directed Graphs for the Recognition of Assembly Lines
Antonios Kalampakas, Stefanos Spartalis and Lazaros Iliadis

Workshop: MHD5
Mining Humanistic Data
Chair: Christos Makris

The Strength of Negative Opinions
Athanasios Papaoikonomou, Magdalini Kardara, Konstantinos Tserpes and Theodora Varvarigou

Extracting Knowledge from Web Search Engine Using Wikipedia
Andreas Kanavos, Christos Makris, Yannis Plegas and Evangelos Theodoridis

AppendicitisScan Tool: a New Tool for the Efficient Classification of Childhood Abdominal Pain Clinical Cases Using Machine Learning Tools
Athanasios Mitroulias, Konstantinos Theofilatos, Spiros Likothanassis and Seferina Mavroudi

Workshop: CIAB3
Computational Intelligence Applications in Bioinformatics
Chair: Chrisina Jayne

15:00-16:00

Classification Models for Alzheimer’s Disease Detection
Christos-Nikolaos Anagnostopoulos, Ioannis Giannakou, Christian Spener, Andrew Simmons, Patrizia Mecocci, Hikka Soininen, Iwona Kloszweska, Bruno Vellas, Simon Lovestone and Maiga Tsalaki

Classification of Risk Factors in Abdominal Pain
Theodora Illiou, Christos-Nikolaos Anagnostopoulos, Ioannis Stephanakis and George Anastassopoulos

Analysis of DNA Barcode Sequences Using Neural Gas and Spectral Representation
Antonino Fiannaca, Massimo La Rosa, Riccardo Rizzo and Alfonso Urso

A Genetic Algorithm for Pancreatic Cancer Diagnosis
Charalampos Moschopoulos, Dusan Popovic, Alejandro Sifrim, Grigorios Beligiannis, Bart De Moor and Yves Moreau

Workshop: MHD6
Mining Humanistic Data
Chair: Vassilios Verykios

15:00-16:00

Multilingual Representation of Possessive Pronouns in Universal Networking Language
Velislava Stoykova

Sleep Spindle Detection in EEG Signals combining HMMs and SVMs
Iosif Mpors, Panagiots Korveis, Evangelia I. Zacharaki and Vasileios Megalookonomou
### EANN Session 14: MEDA2

**Medical Applications of AI-Bioinformatics**

Chair: Harris Papadopoulos

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<th>Time</th>
<th>Session</th>
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<tr>
<td>16:30-17:30</td>
<td>Probabilistic Prediction for the Detection of Vesicoureteral</td>
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<td>Application of a Neural Network for Improve the Automatic Measurement</td>
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<td>J. Luis Salazar Mendiola, Jose Luis Vargas Luna, Jose Luis Gonzalez Guerra</td>
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<td>and Jorge Armando Cortes Ramirez</td>
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<td>3D Molecular Modelling of the Helicase Enzyme of the Endemic, Zoonotic</td>
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<td>Greek Goat Encephalitis Virus</td>
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<td>Dimitrios Vlachakis, Georgia Tsiliki and Sophia Kossida</td>
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### Workshop: MHD7

**Mining Humanistic Data**

Chair: Giannis Karydis

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<th>Time</th>
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<tr>
<td>16:30-17:30</td>
<td>Medical Decision Making via Artificial Neural Networks: a Smart Phone-</td>
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<td>embedded Application Addressing Pulmonary Diseases’ Diagnosis</td>
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<td>George - Peter Economou and Vaios Papaioannou</td>
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<td>A Simulator for Privacy Preserving Record Linkage</td>
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<td>Alexandros Karakasisis and Vassilios Verykios</td>
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<td>Development of a Clinical Decision Support System Using AI, Medical</td>
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<td>Data Mining and Web Applications</td>
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<td>Dimitrios Tsolis, Kalliroi Paschali, Anna Tsakona and Zafeiria-Marina</td>
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<td>Ioannou, Spiridon Likothanasis, Athanasios Tsakalidis, Theodore</td>
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<td>Alexandrides and Athanasios Tsamandas</td>
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<td>Supporting and Consulting Mechanism for Teachers during Distance Learning</td>
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<td>Process: The case of Russian Verbs</td>
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<td>Xenia Kalita, Alexander Gartsov, Giorgos Pavlidis and Photis Nanopoulos</td>
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General Conference Information

Registration
The conference registration will take place each day of the conference (13th - 15th September) 9:30 am - 10:30 am.

Help and Support
If you need help or additional information during the symposium please contact one of the 14th EANN organizers.

Phone country code
For Greece is ++30.

Electricity
The voltage/frequency in Greece is AC 230 volts / 50 Hz with a plug of two round pins set parallel to each other (Type B). Non Greek participants may need a plug adapter and/or a voltage converter for electrical appliances.

Time
Greece is located in the Eastern European Summer Time (EEST). During the conference the summer Daylight Saving Time is in effect: UTC +3 hours or GMT + 2 hours.

Information for Presenters
Presentation time (including time for questions) is 15-20 minutes.

Please be considerate to the other speakers: keep to the allowed time.

You can present using laptops located at each presentation room. Earlier during the conference, please go to the room in which you will be presenting in order to copy your presentation files onto the conference laptop computer. Ask for help from the technical stuff at each room. Test it to make sure it runs as expected.

Conference venue
Athena Pallas Village

This property has its own private beach in Elia, 5 miles away from Neos Marmaras. Athena Pallas features 2 restaurants, and a swim-up bar and excellent spa facilities. Athena Pallas’s beautifully furnished rooms and suites feature wooden beams and stone features. All come complete with satellite TV, air conditioning and minibar. Athena Pallas Village’s spa center features massage rooms, sauna, jacuzzi, hammam and indoor heating pool. Guests can also choose from 3 outdoor swimming pools to refresh in. The main restaurant, Doxato, has a rich breakfast and dinner buffet. Regional dishes are served at the Aegean Taste tavern with views of the lovely pool area. There are also 3 snack bars near the pool.