Program

12th EANN / 7th AIAI Joint Conferences

15 - 18 Sep 2011, Corfu, Greece

Engineering Applications of Neural Networks / Artificial Intelligence Applications and Innovations

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Index

Welcome to the 12th EANN / 7th AIAI Conferences

Welcome to the 12th EANN (Engineering Applications of Neural Networks) / 7th AIAI (Artificial Intelligence Applications and Innovations) Joint Conferences. The 2011 co-organization of the 12th EANN and 7th AIAI Conferences is a major technical event in the fields of Soft Computing and AI respectively.

EANN is technically supported by the IEEE Greece Sector and by the INNS (International Neural Network Society) EANN Special Interest Group. Since the first conference in 1995, EANN has provided a great discussion forum on engineering applications of neural networks and related artificial intelligence technologies. EANN promotes the use of neural networks and associated techniques where significant benefits can be derived from their use. The conference is not only for reporting advances in techniques, but also for showing how neural networks provide practical solutions in a wide range of applications. Novel, innovative applications and methods are particularly appreciated. The conference attracts between 100 engineers, researchers, academics and managers from universities, research centers and industry. Papers are presented orally and not more than 2 sessions are held simultaneously in order to offer a real forum for discussion. Submissions are welcome from all fields of informatics and engineering and some special sessions, dedicated to these different fields, are organized. Both theoretical and practical works are submitted, but the authors are encouraged to focus their paper on the presentation of an application featuring experimental results on real world data.

AIAI is technically supported by the IFIP (International Federation for Information Processing). The ever expanding abundance of information and computing power enables researchers and users to tackle highly interesting issues, such as applications providing personalized access and interactivity to multimodal information based on user preferences and semantic concepts or human-machine interface systems utilizing information on the affective state of the user. The general focus of the AIAI conference is to provide insights on how AI can be implemented in real world applications. Also research papers describing advanced prototypes, innovative systems, tools and techniques are encouraged. General survey papers indicating future directions and professional work-in-progress reports are of equal interest. Acceptance will be based on quality, originality and the practical value of the work.

We would very much like to thank Hassan Kazemian (London Metropolitan University) and Pekka Kumpulainen (Tampere University of Technology, Finland) for their kind effort to organize successfully the Applications of Soft Computing to Telecommunications workshop (ASCOTE). Moreover we would like to thank Efstratios Georgopoulos (TEI of Kalamata, Greece), Spiridon Likothanassis, Athanasios Tsakalidis and Seferina Mavroudi (University of Patras, Greece) and also Grigorios Beligiannis (University of Western Greece) for their contribution to the organization of the Computational Intelligence Applications in Bioinformatics (CIAB) workshop. We are grateful to Andreas Andreou (Cyprus University of Technology) and Harris Papadopoulos (Frederick University of Cyprus) for the organization of the Computational Intelligence in Software Engineering workshop (CISE). The Artificial Intelligence Applications in Biomedicine (AIAB)

workshop was organized successfully in the framework of the 12th EANN 2011 conference and we wish to thank Harris Papadopoulos, Efthyvoulos Kyriacou (Frederick University of Cyprus), Ilias Maglogiannis (University of Central Greece) and George Anastassopoulos (Democritus University of Thrace, Greece). Finally, the second workshop on Informatics & Intelligent Systems Applications for Quality of Life information Services (2nd ISQLIS) was held successfully and we would like to thank Kostas Karatzas (Aristotle University of Thessaloniki, Greece) Lazaros Iliadis (Democritus University of Thrace, Greece) and Mihaela Oprea (University Petroleum-Gas of Ploiesti, Romania). The accepted papers of all five workshops (after passing through a peer review process by independent academic referees) were published in the Springer Proceedings. They include timely applications and theoretical research on specific subjects. We hope that all of them will be well established in the future and that they will be repeated every year in the framework of these conferences.

The conferences will be held in the premises of the Ionian University and more specifically in the Department of Informatics. We are certain that it will provide a stimulating forum for scientists, engineers and students. It is the first time that these two well established events will be hosted under the same umbrella, in the beautiful Greek island of Corfu in the Ionian Sea. It is an island located in a privileged position on the northwestern coast of Greece. Corfu is proud of her history, her Venician architecture and art. You will find there the "Achillion" Palace which served for decades as the official residence of Princes Sissy, the ancient castle and the "Mon Repos" Palace. In Corfu one can see a major and very important collection of Chinese and Asian art with dozens of exhibits coming from Chinese imperial dynasties. Finally you will have the chance to swim in the fantastic beaches of the island and to walk through the narrow paths along the old city.

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About EANN 2011

Sponsored by IEEE Greece Sector and by INNS International Neural Network Society EANN Special Interest Group. Since the first conference in 1995, EANN has provided a great discussion forum on engineering applications of neural networks and related artificial intelligence technologies. EANN promotes the use of neural networks and associated techniques where significant benefits can be derived from their use. The conference is not only for reporting advances in techniques, but also for showing how neural networks provide practical solutions in a wide range of applications. Novel, innovative applications and methods are particularly appreciated.

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Keynote Lectures

Professor Nikola Kasabov

Ex-President of the INNS (International Neural Network Society) Founding Director and the Chief Scientist of the Knowledge Engineering and Discovery Research Institute (KEDRI), Auckland (www. kedri.info/). He holds a Chair of Knowledge Engineering at the School of Computing and Mathematical Sciences at Auckland University of Technology. He is a Fellow of the Royal Society of New Zealand, Fellow of the New Zealand Computer Society and a Senior Member of IEEE. He is the President of the International Neural Network Society (INNS) and a Past President of the Asia Pacific Neural Network Assembly (APNNA). He is a member of several technical committees of the IEEE Computational Intelligence Society and of the IFIP AI TC12. Kasabov is Associate Editor of several international journals that include Neural Networks, IEEE TrNN, IEEE TrFS, Information Science, J. Theoretical and Computational Nanosciences. He chairs a series of int. conferences ANNES/NCEI in New Zealand. N Kasabov holds MSc and PhD from the Technical University of Sofia. His main research interests are in the areas of intelligent information systems, soft computing, neuro-computing, bioinformatics, brain study, speech and image processing, novel methods for data mining and knowledge discovery. He has published more than 400 publications that include 15 books, 120 journal papers, 60 book chapters, 32 patents and numerous conference papers. He has extensive academic experience at various academic and research organizations: University of Otago, New Zealand; University of Essex, UK; University of Trento, Italy; Technical University of Sofia, Bulgaria; University of California at Berkeley; RIKEN and KIT, Japan; TUniversity Kaiserslautern, Germany, and others.

Evolving, Probabilistic Spiking Neural Network Reservoirs for Spatio- and Spectro-Temporal Data

Friday, September 16
09.00 - 10.00

Spatio- and spectro-temporal data (SSTD) are the most common data in many domain areas, including bioinformatics, neuroinformatics, ecology, environment, medicine, economics, etc., and still there are no sufficient methods to model such data and to discover complex spatio-temporal patterns from it. The talk introduces new methods for modeling and pattern recognition of SSTD based on novel evolving probabilistic spiking neural network reservoir (epSNNr) architecture. The epSNNr are built of probabilistic neurons that extent the popular integrate-and-fire models with the introduction of some biologically plausible probabilistic parameters. epSNNr allow to model stochastic processes, to learn noisy SSTD, and to efficiently recognize complex patterns from incoming streams of SSTD. The epSNNr learn whole chunks of input SSTD, rather than learning the data from single time frames. The epSNNr are evolving structures that learn and adapt to new incoming data streams in a fast incremental way. To control the numerous parameters of the epSNNr a gene regulatory network (GRN) is introduced, to obtain a computational neuro-genetic model (CNGM). Applications across domain areas are demonstrated, including: moving object recognition; sound recognition; integrated audio-visual pattern recognition; EEG data modeling; design of artificial cognitive and emotional systems. Challenging open problems and future directions are presented.

Professor Tom Heskes

Professor of Artificial Intelligence, and head of the Machine Learning Group, at the Institute for Computing and Information Sciences, Radboud University Nijmegen, the Netherlands. He is further affiliated Principal Investigator at the Donders Centre for Neuroscience and director of the Institute for Computing and Information Sciences. Prof Heskes' research is on artificial intelligence, in particular (Bayesian) machine learning. He works on Bayesian inference (approximate inference, hierarchical modeling, dynamic Bayesian networks, preference elicitation); machine learning (multi-task learning, bias-variance decompositions); and neural networks (on-line learning, self-organizing maps, time-series prediction) with applications to, among others, neuroscience and bioinformatics. Prof Heskes is the Editor-in-Chief of the Neurocomputing Journal.

Reading the Brain with Bayesian Machine Learning	Saturday, September 17 11.00 - 12.00

Machine learning is about learning models from data. In so-called Bayesian machine learning we build probabilistic models and use probability calculus, in particular Bayes' rule, to infer the unknown model parameters given the observed data. In my presentation I will show where this leads to by highlighting some of the applications that we work on related to neuroimaging: brain-computer interfaces based on covert attention and brain reading by decoding fMRI images.

Professor A G. Cohn

Professor of Automated Reasoning Director of Institute for Artificial Intelligence and Biological Systems, School of Computing, University of Leeds, UK . Tony Cohn holds a Personal Chair at the University of Leeds, where he is Professor of Automated Reasoning. He is presently Director of the Institute for Artificial Intelligence and Biological Systems. He leads a research group working on Knowledge Representation and Reasoning with a particular focus on qualitative spatial/spatio-temporal reasoning, the best known being the well cited Region Connection Calculus (RCC). His current research interests range from theoretical work on spatial calculi and spatial ontologies, to cognitive vision, modelling spatial information in the hippocampus, and detecting buried underground assets (e.g. utilities and archaeological residues) using a variety of geo-located sensors. He has been Chairman/President of SSAISB, ECCAI, KR inc, the IJCAI Board of Trustees and is presently Editor-in-Chief of the AAAI Press, Spatial Cognition and Computation, and the Artificial Intelligence journal. He was elected a founding Fellow of ECCAI, and is also a Fellow of AAAI, AISB, the BCS, and the IET.

Learning about Activities and Objects from Video

Sunday, September 18
09.00 - 10.00

Prof Cohn will present ongoing work at Leeds on building models of video activity. He will present techniques, both supervised and unsupervised, for learning the spatio-temporal structure of tasks and events from video or other sensor data. In both cases, the representation will exploit qualititive spatio-temporal relations. A novel method for robustly transforming video data to qualitative relations will be presented. For supervised learning he will show how the supervisory burden can be reduced using what we term "deictic supervision", whilst in the unsupervised case he will present a method for learning the most likely interpretation of the training data. He will also show how objects can be "functionally categorised" according to their spatio-temporal behaviour and how the use of type information can help in the learning process, especially in the presence of noise. Finally he will present results from several domains including a kitchen scenario and an aircraft apron.

Professor Vera Kurkova

Institute of Computer Science, Academy of Sciences of the Czech Republic

Inverse Problems in Learning From Data

Generalization capability in learning from data can be investigated in terms of regularization, which has been used in many branches of applied mathematics to obtain stable solutions of inverse problems, i.e., problems of finding unknown causes (such as shapes of functions) of known consequences (such as measured data). It will be shown that supervised learning modelled in terms of minimizations of error functionals can be reformulated as inverse problems with solutions in spaces of functions defined by kernels. Mathematical results from theory of inverse problems can be applied to propose new types of computational units, to design stabilizers increasing generalization, and to construct optimal solutions of learning tasks, which can be used to design learning algorithms based on solutions of systems of linear equations.

Learning from data: minimization of the empirical error functional defined by a sample of data and minimization of the expected error functional defined by a probability distribution, optimizations of error functionals as best approximations. Generalization: generalization in learning as a stability of solutions with respect to small changes of data, penalization of solutions with high-frequency oscillation, output-weight regularization.

Inverse problems: well and ill-posed problems, well and ill-conditioned problems, Moore-Penrose pseudosolution, measures of stability, regularization as improvement of stability, properties of optimal and regularized solutions.

Representation of learning as an inverse problem: typical operators defining inverse problems, tomography and Radon transform, operators defining inverse problems modeling learning, characterization of optimal and regularized solutions, comparison of regularized and non regularized case.

Three reasons for using kernels in machine learning: kernels define a class of hypothesis spaces satisfying assumptions needed for application of main results from theory of inverse problems, kernels define stabilizers penalizing various types of high-frequency oscillations, kernels define transformations of input space geometry allowing more types of data to be separated linearly.

Learning algorithms based on solutions of inverse problems: neural network learning as a solution of a system of linear equations, computational units using tensor products and combinations of kernels, approximate optimization as complexity reduction, comparison with algorithms operating on networks with smaller number of units than the size of the sample of data.

Professor Michel Verleysen

Professor - Honorary Research Director FNRS Universite Catholique de Louvain Machine Learning Group ICTEAM Institute Louvain School of Engineering, Belgium

Nonlinear Dimensionality Reduction & Feature Selection

Saturday, September 17
14.00 - 15.00

Machine learning methods are used to build models for classification and regression tasks, among others. Models are built on the basis of information contained in a set of samples, with few or no information about the underlying process. The more information there is in the set of samples, the better the model should be. However, this natural assumption does not always hold, since most machine learning paradigms suffer from the curse of dimensionality. The curse of dimensionality means that strange phenomena appear when data are represented in a high-dimensional space. These phenomena are most often counter-intuitive: the conventional geometrical interpretation of data analysis in 2- or 3-dimensional spaces cannot be extended to much higher dimensions. Among the problems related to the curse of dimensionality, the feature redundancy and concentration of the norm are probably those that have the largest impact on data analysis tools. Feature redundancy means that models will lose the identifiability property (for example they will oscillate between equivalent solutions), will be difficult to interpret, etc.; although it is an advantage on the point of view of information content in the data, the redundancy makes the learning of the model more difficult. The concentration of the norm is a more specific unfortunate property of high-dimensional vectors: when the dimension of the space increases, norms and distance will concentrate, making the discrimination between data more difficult. Most data analysis tools are not robust to these phenomena. Their performance collapse when the dimension of the data space increases, in particular when the number of data available for learning is limited. This tutorial will start by a presentation of phenomena related to the curse of dimensionality. Then, feature selection and nonlinear dimensionality reduction will be discussed, as possible remedies to this curse. Feature selection consists in selecting some of the variables/features among those available in the dataset, according to a relevance criterion. The goal is twofold: to avoid redundancy between features, and to discard irrelevant ones. State-of-the-art feature selection methods based on information theory criteria will be presented, together with the respective advantages of filter, wrapper and embedded methods. Nonlinear dimensionality reduction, or manifold learning, consists in mapping the high-dimensional data to a lower-dimensional representation, while preserving some topology, distance or information criterion. Such nonlinear projection methods may be used both for dimensionality reduction (therefore fighting the curse of dimensionality), and for the visualization of data when the manifold dimension is restricted to 2 or 3. The tutorial will conclude by opening new challenges and questions in the field of feature selection and dimensionality reduction.

Professor Dominic Palmer-Brown and **Dr Chrisina Jayne**

London Metropolitan University, UK

Self-organisation Modal Learning Algorithms

Sunday, September 18
14.20 - 15.20

Modal learning in neural computing refers to the strategic combination of modes of adaptation and learning within a single artificial neural network structure. Modes, in this context, are learning methods that are transferable from one learning architecture to another, such as weight update equations. Two or more modes may proceed in parallel in different parts of the neural computing structure (layers and neurons), or they occupy the same part of the structure, and there is a mechanism for allowing the neural network to switch between modes. The switching can be periodic, random, or performance guided. When we look at human and machine learning in a wider context, there are many reasons and motivations to consider modal learning, as it allows for a range of learning methods to be taken into account, along the spectrum from memorisation to generalisation. From a theoretical perspective any individual mode has inherent limitations because it is trying to optimise a particular objective function. Since we cannot in general know a priori the most effective learning method or combination of methods for solving a given problem, we should equip the system (the neural network) with the means to discover the optimal combination of learning modes during the learning process. There is potential to furnish a neural system with numerous modes. Most of the work conducted so far concentrates on the effectiveness of two to four modes. The modal learning approach applies equally to supervised and unsupervised (including self organisational) methods. Snap-Drift Neural Network (SDNN), introduced by (Lee, S. W., Palmer-Brown, 2004), is an example of a modal learning method which toggles its weight update equation between two modes: Min(Fuzzy AND) and Learning Vector Quantization. This tutorial focuses on the Snap-Drift Neural Network and two recent developments of the algorithm related to self-organisational maps and sequence learning. The Snap-Drift SOM (SDSOM) adopts the Kohonen SOM architecture, while the Recurrent SDNN uses the Simple Recurrent Network architecture (RSDNN). In the tutorial we review modal learning in general, and present the Snap-Drift algorithms. We demonstrate their use and results obtained with Matlab implementations for well known data sets and real-world applications.

Workshops

Workshop on Applications of Soft Computing to Telecommunications ASCOTE 2011

Saturday, September 17
09.00 - 10.30

Program chairs:

Hassan Kazemian, *Director of Intelligent Systems Research Centre, Faculty of Computing, London Metropolitan University, UK*

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

2nd Workshop on Informatics & Intelligent Systems Applications for Quality of Life Information Services ISQLIS 2011

Sunday, September 18
15.20 - 16.50

Program chairs:

Kostas Karatzas, *Aristotle University of Thessaloniki, Greece*

Lazaros Iliadis, *Democritus University of Thrace, Greece*

Mihaela Oprea, *University Petroleum-Gas of Ploiesti, Romania*

1st International Workshop on Computational Intelligence in Software Engineering CISE 2011

Friday, September 16
14.30 - 15.30
16.50 - 17.30

Program Chairs:

Andreas S. Andreou, *Department of Electrical Engineering and Information Technology, Cyprus University of Technology, Cyprus*

Harris Papadopoulos, *Department of Computer Science and Engineering, Frederick University, Cyprus*

Workshop on Computational Intelligence Applications in Bioinformatics CIAB 2011

Friday, September 16
10.30 - 11.30
12.50 - 13.30

Program chairs:

Spiridon D. Likothanassis, *University of Patras, Greece*

Efstratios F. Georgopoulos, *Technological Educational Institute of Kalamata, Greece*

Seferina Mavroudi, *University of Patras, Greece*

Grigorios Beligiannis, *Department of Business Administration of food and Agricultural Enterprises*

Adam Adamopoulos, *Democritus University of Thrace, Greece*

Athanasios Tsakalidis, *University of Patras, Greece*

Workshop on Artificial Intelligence Applications in Biomedicine AIAB 2011

Saturday, September 17
15.00 - 16.15
Sunday, September 18
11.40 - 13.20

Program chairs:

Harris Papadopoulos, *Frederick University, Cyprus*

Efthyvoulos Kyriacou, *Frederick University, Cyprus*

Ilias Maglogiannis, *University of Central Greece*

George Anastassopoulos, *Democritus University of Thrace, Greece*

Program at a glance

	Friday 16/09/11
08:30-09:00	Registration (Corfu Holiday Palace Hotel)
09:00-10:00	Invited talk by Kasabov (Corfu Holiday Palace Hotel)

10:30-11:30	Session 1 : CVR
	Session 13 : CL_PR1
	Workshop : CIAB 1
11:30-11:50	Coffee Break
11:50-12:50	Tutorial by Kurkova
12:50-13:30	Session 2 : FIN_M_QA1
	Session 14 : CL_PR2
	Workshop : CIAB 2
13:30-14:30	Lunch
14:30-15:30	Session 3 : FS
	Session 15 : LE_RE_RBF1
	Workshop : CISE 1
15:30-15:50	Coffee Break
15:50-16:50	Session 4 : NOV_AL_OPT
	Session 16 : LE_RE_RBF2
16:50-17:30	Wokshop : CISE 2
	Session 17 : EVOL1

	Thursday 15/09/11
18:00	Guided Walking Tour of Corfu (departure from Old Fortress, opposite from Cavalieri Hotel)
20:00	Classic music concert Welcome Reception (Corfu Holiday Palace Hotel)

	Saturday 17/09/11
08:30-09:00	Registration
09:00-10:30	Session 5 : ML_FC
	Session 18 : SVM
	Workshop : ASCOTE
10:30-11:00	Coffee Break
11:00-12:00	Invited talk by Heskes
12:00-12:50	Session 6 : MED_ETH
	Session 19 : LE_RE_RBF3
	Session 7 : WEB_TXT1
13:00-14:00	Lunch
14:00-15:00	Tutorial by Verleysen
15:00-16:15	Session 8 : MED
	Session 20 : FE_EX
	Wokshop : AIAB 1
16:30	Achilion Palace Guided Tour Gala Dinner

	Sunday 18/09/11
08:30-09:00	Registration
09:00-10:00	Invited talk by Cohn
10:00-11:20	Session 9 : WEB_TXT2
	Session 21 : MED_ANN
	Session 22 : LE_RE_RBF4
11:20-11:40	Coffee Break
11:40-13:20	Session 10 : ENV
	Workshop : AIAB 2
	Session 23 : MULTI
13:20-14:20	Lunch
14:20-15:20	Tutorial by Palmer-Brown, Jayne
15:20-16:50	Session 11 : PR_CON
	Session 24 : CL_PR3
	Workshop : ISQLIS
16:50-17:10	Coffee Break
17:10-18:10	Session 12 : FIN_M_QA2
	Session 25 : FSYS
	Session 26 : EVOLV2

Detailed Program

Thursday 15/9/2011

Guided Walking Tour of Corfu (departure from Old Fortress, opposite from Cavalieri Hotel) — 18:00

Classic music concert – Welcome Reception (at Corfu Holiday Palace Hotel) — 20:00

Friday 16/9/2011

Registration (at Corfu Holiday Palace Hotel) — 08:30-09:00

Welcome message by **Professor Vasilis Chrisikopoulos** — 09:00

Keynote Lecture 1 — Plenary Session 1 (Corfu Holiday Palace Hotel)	
Professor Nikola Kasabov *Evolving, Probabilistic Spiking Neural Network Reservoirs for Spatio- and Spectro-Temporal Data* Chair: **Dominic Palmer Brown**	09:00-10:00

AIAI Session 1: CVR **Computer Vision & Robotics** Chair: **Nikoletta Nicolaou**	10:30-11:30
Real Time Robot Policy Adaptation Based on Intelligent Algorithms *Capi, Toda, Kaneko*	*full*
A Model and Simulation of Early-stage Vision as a Developmental Sensorimotor Process *Georgeon, Cohen, Cordier*	*short*
Enhanced Object Recognition in Cortex-like Machine Vision *Tsitiridis, Yuen*	*full*

EANN Session 13: CL_PR1 **Classification – Pattern Recognition 1** Chair: **Nikola Kasabov**	10:30-11:30

SOM Based Clustering and Optimization of Production *Potočnik, Berlec, Starbek, Govekar*	*full*

Hypercube Neural Network Algorithm for Classification *Palmer-Brown, Jayne*	*full*

Behavioral Profiles for Building Energy Performance Using Exclusive SOM *Iglesias, Cantos, Kastner, Montero*	*short*

Workshop **CIAB 1** Chair: **Efstratios Georgopoulos**	10:30-11:30

Mathematical Models of Dynamic Behaviour of Individual Neural Networks
Pagania, Adamopoulos, Likothanassis

Towards Optimal Microarray Universal Reference Sample Designs
Potamias, Kaforou, Kafentzopoulos

Information-Preserving Techniques Improve Chemosensitivity Prediction
Christodoulou, Roe, Folarin, Tsamardinos

COFFEE BREAK	11:30-11:50

Tutorial 1 Plenary Session 2 **Professor Vera Kurkova** *Inverse Problems in Learning from Data* Chair: **Lazaros Iliadis**	11:50-12:50

AIAI Session 2: FIN_M_QA1 **AI in Finance, Management and Quality Assurance 1** Chair: **Ioannis Stephanakis**	12:50-13:30

Intelligent Software Project Scheduling and Team Staffing with Genetic Algorithms *Stylianou, Andreou*	*full*

Time Variations of Association Rules in Market Basket Analysis *full*
Papavasileiou, Tsadiras

EANN Session 14: CL_PR2 **Classification – Pattern Recognition 2** Chair: **Ioannis Hatziligeroudis**	12:50-13:30

Improving the Classification Performance of Liquid State Machines Based on the Separation Property *full*
Hourdakis, Trahanias

Optimal Fuzzy Controller Mapped from LQR under Power and Torque Constraints *short*
Chen, Lian

Workshop **CIAB 2** Chair: **Spiros Likothanasis**	10:30-11:30

Optimizing Filter Processes on Protein Interaction Clustering Results
Moschopoulos, Beligiannis, Kossida, Likothanassis

Adaptive Filtering Techniques Combined with Natural Selection
Dimitrakopoulos, Theofilatos, Georgopoulos, Likothanassis, Tsakalidis, Mavroudi

LUNCH	13:30-14:30

AIAI Session 3: FS **Fuzzy Systems** Chair: **Hassan Kazemian**	14:30-15:30

Using a Combined Intuitionistic Fuzzy Set-TOPSIS Method for Evaluating Project and Portfolio Management Information Systems *full*
Gerogiannis, Fitsilis, Kameas

Fuzzy and Neuro-Symbolic Approaches to Assessment of Bank Loan Applicants *full*
Hatzilygeroudis, Prentzas

Comparison of Fuzzy Operators for IF-Inference Systems of Takagi-Sugeno Type in Ozone Prediction *short*
Olej, Hájek

EANN Session 15: LE_RE_RBF1
Learning - Recurrent & RBF ANN 1
Chair: **Efstratios Georgoupoulos**

14:30-15:30

Time-Frequency Analysis of Hot Rolling using Manifold Learning
Fernández, Blanco, García, López, Ordoñez, González

short

ART-based Fusion of Multi-Modal Information for Mobile Robots
Berghöfer, Schulze, Tscherepanow Wachsmuth

full

Quantization of Adulteration Ratio of Raw Cow Milk by Least Squares Support Vector Machines (LS-SVM) and Visible/Near Infrared Spectroscopy
Hsieh, Hung Kuo

full

Workshop
CISE 1
Chair: **Andreas Andreou**

14:30-15:30

Global Optimization of Analogy-Based Software Cost Estimation
Milios, Stamelos, Chatzibagias

The Impact of Sampling and Rule Set Size
MacDonell

Intelligent Risk Identification and Analysis in Computer Systems
Mohammadian

COFFEE BREAK

15:30-15:50

AIAI Session 4: NOV_AL_OPT
Novel Algorithms & Optimization
Chair: **Andre Krause**

15:50-16:50

A New Criterion for Clusters Validation
Alizadeh, Minaei, Parvin

short

Generalized Bayesian Pursuit: a Novel Scheme for Multi-Armed Bernoulli Bandit Problems
Zhang, B. Oommen, Granmo

full

A Recurrent Neural Network Multivalued for the Quadratic Assignment Problem
Triviño, Muñoz, Domínguez

full

EANN Session 16: LE_RE_RBF **Learning - Recurrent & RBF ANN 2** Chair: **Spiros Likothanasis**	15:50-16:50

Anomaly Detection from Network Logs Using Diffusion Maps — *full*
Sipola, Juvonen, Lehtonen

Large Datasets: a Mixed Method to Adapt and Improve their Learning by Neural Networks used in Regression Contexts — *full*
Sauget, Henriet, Michel Salomon and Sylvain Contassot-Vivier

LQR-Mapped Fuzzy Controller Applied to Attitude Stabilization of a Power-Aided-Unicycle — *short*
Chen, Hsu, Fong

Workshop **CISE 2** Chair: **Andreas Andreou**	16:50-17:30

Benchmark Generator for Software Testers
Ferrer, Chicano, Alba

Automated Classification of Medical-billing Data
Crandall, Lynagh, Mehoke, Pepper

EANN Session 17: EVOL1 **Evolutionary Algorithms & Optimization 1** Chair: **Chrisina Jayne**	16:50-17:30

Evolutionary Algorithm Optimization of Edge Delivery Sites in Next Generation Multi-Service Content Distribution Networks — *full*
Stephanakis, Logothetis

Neural Networks Approach to Optimization of Steel Alloys Composition — *full*
Koprinkova-Hristova, Tontchev, Popova

Registration 08:30-09:00

AIAI Session 5: ML_FC
Computer Vision & Robotics
Chair: **Ioannis Stamelos**

09:00-10:30

Comparative Analysis of Content-based and Context-based Similarity on Musical Data Boletsis, Gratsani, Chasanidou, Karydis, Kermanidis	*full*
Ranking Functions in Large State Spaces Häming, Peters	*full*
Machine Learning of User Preferences in a Declarative Modelling Environment Bardis, Golfinopoulos, Makris, Miaoulis, Plemenos	*full*
Learning Shallow Syntactic Dependencies from Imbalanced Datasets: A Case Study in Modern Greek and English Karozou, Kermanidis	*short*
Modeling and Dynamic Analysis on Animals' Repeated Learning Process Lin, Yang, Xu	*short*

EANN Session 18: SVM
Support Vector Machines
Chair: **Harris Papadopoulos**

09:00-10:30

Object Segmentation using Multiple Neural Networks for Commercial Offers Visual Search Gallo, Nodari, Vanetti	*full*
Determining Soil – Water Content by Data Driven Modeling when Relatively Small Data Sets Are Available Cisty	*short*
Permutation Entropy for Discriminating 'Conscious' and 'Unconscious' State in General Anaesthesia Nicolaou, Houris, Alexandrou, Georgiou	*full*
Support Vector Machines versus Artificial Neural Networks for Wood Dielectric Loss Factor Estimation Iliadis, Tachos, Avramidis, Mansfield	*full*

ASCOTE

09:00-10:30

Chair: **Hassan Kazemian**

An Intelligent Approach to Detect Probe Request Attacks
Ratnayake, Kazemian, Yusuf, Abdullah

An Intelligent Keyboard Framework for Improving Disabled People
Ouazzane, Li, Kazemian

Finding 3g Mobile Network Cells with Similar Radio Interface Quality Problems
Kumpulainen, Särkioja, Kylväjä, Hätönen

Analyzing 3G Quality Distribution Data with Fuzzy Rules and Fuzzy Clustering
Kumpulainen, Särkioja, Kylväjä, Hätönen

Adaptive Service Composition for Meta-Searching in a Mobile Environment
Cheung, Kazemian

Simulation of Web Data Traffic Patterns Using Fractal Statistical Modelling
Tang, Kazemian

COFFEE BREAK | 10:30-11:00

Keynote Lecture 2
Plenary Session 3

Professor Tom Heskes
Reading the Brain with Bayesian Machine Learning
Chair: **Vera Kurkova**

11:00-12:00

AIAI Session 6: MED_ETH

Medical Applications & Ethics of AI

12:00-12:50

Chair: **Ilias Maglogiannis**

Data Mining Tools used in Deep Brain Stimulation Treatments - Analysis Results
Geman

short

Reliable Probabilistic Prediction for Medical Decision Support
Papadopoulos

full

Ethical Issues of Artificial Biomedical Applications
Alexiou, Psixa, Vlamos

short

EANN Session 19: LE_RE_RBF3

Learning - Recurrent & RBF ANN 3
Chair: **Tom Heskes**

12:00-12:50

Application of Radial Basis Network and Response Surface Method to Quantify Compositions of Raw Goat Milk with Visible/Near Infrared Spectroscopy
Hsieh, Hung, Lin

short

A Neural Based Approach and Probability Density Approximation for Fault Detection and Isolation in Nonlinear Systems
Boi, Montisci

short

Method for Training a Spiking Neuron to Associate Input-output Spike Trains
Mohemmed, Schliebs, Matsuda, Kasabov

full

AIAI Session 7: WEB_TXT1

Web-Text Mining & Semantics 1
Chair: **Katia Kermanidis**

12:00-12:50

Modeling of Web Domain Visits by Radial Basis Function Neural Networks and Support Vector Machine Regression
Olej, Filipová

short

A Framework for Web Page Rank Prediction
Voudigari, Pavlopoulos, Vazirgiannis

full

LUNCH

13:00-14:00

Tutorial 2   Plenary Session 4

Professor Michel Verleysen
Nonlinear Dimensionality Reduction and Feature Selection
Chair: **Vasilis Chrisikopoulos**

14:00-1500

AIAI Session 8: MED
Medical Applications of AI
Chair: **Mauricio Fiasche**

15:00-16:15

Cascaded Window Memoization for Medical Imaging *full*
Khalvati, Kianpour, Tizhoosh

Fast Background Elimination in Fluorescence Microbiology Images: *short*
Comparison of Four Algorithms
Gong, Artés-Rodríguez

Experimental Verification of the Effectiveness of Mammography Testing *short*
Description's Standardization
Podsiadły-Marczykowska, Zawislak

EANN Session 20: FE_EX
Feature extraction – minimization
Chair: **Andreas Andreou**

15:00-16:15

Two Different Approaches of Feature Extraction *full*
for Classifying the EEG Signals
Jahankhani, Lara

An Ensemble Based Approach for Feature Selection *short*
Minaei-Bidgoli, Asadi, Parvin

A New Feature Extraction Method based Clustering for Face Recognition *short*
Elferchichi, Zidi, Laabidi, Ksouri, Maouche

Workshop
AIAB 1
Chair: **Harris Papadopoulos**

15:00-16:15

Brain White Matter Lesions Classification in Multiple Sclerosis Subjects
Loizou, Kyriakou, Seimenis, Pantziaris, Christodoulou, Pattichis

Using Argumentation for Ambient Assisted Living
Marcais, Spanoudakis, Moraitis

Modelling Nonlinear Responses of Resonance Sensors
Salpavaara, Kumpulainen

An Adaptable Framework for Integrating and Querying Sensor Data
Ferdous, Kapidakis, Fegaras, Makedon

Guided Tour of Achilion Palace
Gala Dinner at Taverna "Trypas"   18:00

Sunday 18/9/2011

Registration   08:30-09:00

Keynote Lecture 3	Plenary Session 5	
Professor Anthony Cohn		09:00-10:00
Learning about Activities and Objects from Video		
Chair: **Michel Verleysen**		

AIAI Session 9: WEB_TXT2
Web-Text Mining & Semantics 2   10:00-11:20
Chair: **Anthony Cohn**

Towards a Semantic Calibration of Lexical Word via EEG *Poulos*	*full*
A Random Forests Text Transliteration System for Greek Digraphia *Panteli, Maragoudakis*	*short*
Acceptability in Timed Frameworks with Intermittent Arguments *Cobo, Martinez, Simari*	*full*
Object Oriented Modelling in Information Systems **Based on Related Text Data** *Onkov*	*short*

EANN Session 21: MED_ANN
Medical Applications of ANN
Chair: **Georgios Anastasopoulos**

10:00-11:20

A Recurrent Neural Network Approach for Predicting Glucose Concentration in Type-1 Diabetic Patients *Allam, Nossair, Gomma, Ibrahim, Abd Elsalam*	*short*
Segmentation of Breast Ultrasound Images Using Neural Networks *Othman, Tizhoosh*	*full*
Knowledge Discovery and Risk Prediction for Chronic Diseases: an Integrated Approach *Verma, Fiasche', Cuzzola, Carlo Morabito, Irrera*	*full*

EANN Session 22: LE_RE_RBF4
Learning - Recurrent & RBF ANN 4
Chair: **Mario Malcangi**

10:00-11:20

Transferring Models in Hybrid Reinforcement Learning Agents *Fachantidis, Partalas, Tsoumakas, Vlahavas*	*full*
A Neural Network Tool for the Interpolation of foF2 Data in the Presence of Sporadic E Layer *Haralambous, Ioannou, Papadopoulos*	*full*

COFFEE BREAK	11:20-11:40

AIAI Session 10: ENV
Environmental and Earth Applications of AI
Chair: **Kostas Karatzas**

11:40-13:20

EcoTruck: An Agent System for Paper Recycling *Berzigiannis, Sakellariou*	*full*
Prediction of CO and NOx levels in Mexico City using associative models *Arguelles, Yáñez, López, Camacho Nieto*	*full*
Neural Network Approach to Water-Stressed Crops Detection Using Multispectral WorldView-2 Satellite Imagery *Culibrk, Lugonja, Minic, Crnojevic*	*full*

A Generalized Fuzzy-rough Set Application for Forest Fire Risk Estimation Feature Reduction
Tsataltzinos, Iliadis, Spartalis

full

Pollen Classification Based on Geometrical, Descriptors and Colour Features
Rivas, Banos, Travieso Gonzalez, Alonso-Hernández, Pérez-Suárez, Arroyo-Hernández, Mora-Mora

short

EANN Session 23: (MULTI)
Multi Layer ANN
Chair: **Pekka Kumpulainen**

11:40-13:20

Predictive Automated Negotiators Employing Risk-Seeking and Risk-Averse Strategies
Masvoula, Halatsis, Martakos

full

Maximum Shear Modulus Prediction by Marchetti Dilatometer Test Using Neural Networks
Cruz, Santos, Cruz

full

NNIGnets, Neural Networks Software
Fontes, Lopes, Silva, Santos, Marques De Sá

short

Neural Network Rule Extraction to Detect Credit Card Fraud
Ryman-Tubb, Krause

short

Key Learnings From Twenty Years of Neural Network Applications in the Chemical Industry
Owens

full

Workshop
AIAB 2
Chair: **Ilias Maglogiannis**

11:40-13:20

Feature Selection by Conformal Predictor
Yang, Nouretdinov, Luo, Garmmerman

Applying Conformal Prediction to the Bovine TB Diagnosing
Adamskiy, Nouretdinov, Mitchell, Coldham, Gammerman

Classifying Ductal Tree Structures Using Topological Descriptors
Skoura, Megalooikonomou, Bakic, Maidment

Intelligent Selection of Human miRNAs and Mouse mRNAs
Valavanis, Moulos, Maglogiannis, Klein, Schanstra, Chatziioannou

Independent Component Clustering for Skin Lesions Characterization
Tasoulis, Doukas, Maglogiannis, Plagianakos

A Comparison of Venn Machine with Platt's Method
Zhou, Nouretdinov, Luo, Randell, Coldham, Gammerman

LUNCH	13:20-14:20

Tutorial 3	Plenary Session 6	
Professor Dominic Palmer-Brown and **Dr Chrisina Jayne**		14:20-15:20
Self-organisation Modal Learning Algorithms		
Chair: **Ioannis Manolopoulos**		

AIAI Session 11: PR_CON		
Pattern Recognition-Constraints		15:20-16:50
Chair: **Ilias Sakellariou**		

**A New Discernibility Metric and Its Application
on Pattern Classification and Feature Evaluation**
Voulgaris
full

**Predicting Postgraduate Students' Performance Using Machine Learning
Techniques**
Koutina, Kermanidis
full

**Employing a Radial-basis Function Artificial Neural Network to Classify
Western and Transition European Economies Based on the Emissions
of Air Pollutants and on their Income**
Kitikidou, Iliadis
full

**A Bio-inspired Image Representation Model
Using non-Classical Receptive Field**
Wei, Zuo
short

EANN Session 24: CL_PR3 **Classification – Pattern Recognition 3** Chair: **Ignazio Gallo**	15:20-16:50

Induction of Linear Separability through the Ranked Layers of Binary Classifiers *Bobrowski*	*short*
Classifying the Differences in Gaze Patterns of Alphabetic and Logographic L1 Readers - a Neural Network Approach *Krause, Essig, Essig-Shih, Schack*	*full*
Subspace-based Face Recognition on an FPGA *Pizarro, Figueroa*	*full*
A Window-Based Self-Organizing Feature Map For Vector Filtering Segmentation of Color Medical Imagery *Stephanakis, Anastassopoulos, Iliadis*	*short*

Workshop **ISQLIS** Chair: **Kostas Karatzas**	15:20-16:50

Investigation of Medication Dosage Influences
Karatzas, Riga, Voukantsis, Dahl

Combination of Survival Analysis and Neural Networks
Kitikidou, Iliadis

An Artificial Intelligence-Based Environment Quality Analysis System
Oprea, Iliadis

Personalized Information Services for Quality of Life
Voukantsis, Karatzas, Jaeger, Berger

Fuzzy Modeling of the Climate Change Effect to Drought
Papakonstantinou, Iliadis, Pimenidis, Maris

COFFEE BREAK	16:50-17:10

AIAI Session 12: FIN_M_QA2
AI in Finance Management and Quality Assurance
Chair: **Spyros Sioutas**

17:10-18:10

A Software Platform for Evolutionary Computation with Pluggable Parallelism and Quality Assurance
Evangelista, Pinho, Gonçalves, Maia, Sobral, Rocha

short

Classifying the Differences in Gaze Patterns of Alphabetic and Logographic L1 Readers - a Neural Network Approach
Far, Pimenidis, Jahankhan, Wijeyesekera

full

Disruption Management Optimization for Military Logistics
Kaddoussi, Zoghlami, Zgaya, Hammadi and Bretaudeau

short

EANN Session 25: FSYS
Fuzzy Systems
Chair: **Ioannis Karydis**

17:10-18:10

A Neuro-Fuzzy Hybridization Approach to Model Weather Conditions in a Mission Planning and Evaluation System
Rao, Iliadis, Spartalis

full

Employing Smart Logic to Spot Audio in Real Time on Deeply Embedded Systems
Malcangi

full

Vision-based Autonomous Navigation Using Supervised Learning Techniques
Souza, Pessin, Osório, Wolf

full

EANN Session 26: EVOL2
Evolutionary Algorithms & Optimization 2
Chair: **Kyriaki Kitikidou**

17:10-18:10

Application of Neural Networks to Morphological Assessment in Bovine Livestock
Velasco, Orellana, Macías, Caballero, Manso

short

Incremental- Adaptive- Knowledge Based- Learning for Informative Rules Extraction in Classification Analysis of aGvHD
Fiasché, Verma, Cuzzola, Morabito, Irrera

full

Conference Venue

The conference will be held in the premices of the Corfu Holiday Palace Hotel which is located in Kanoni area on Corfu island.

The Plenary Keynote Lecture by Professor Nikola Kasabov will be held in the Corfu Holiday Palace Hotel on the 16th of September 2011 at 9:00 in the morning.

The same location applies to all other conference Sessions, Keynote and Tutorial Plenary Lectures and Workshops.

For further details or questions please contact the organizers.

Registration   The conference registration will take place each day of the conference (16th - 18th September) 8.30 am - 09.00 am.

Help and Support   If you need help or additional information during the symposium please contact one of the 12th EANN / 7th AIAI 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 is (including time for questions):

- For full papers 20 minutes
- For short paper 15 minutes
- For Workshops papers 15 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.

http://delab.csd.auth.gr/eann2011/