Conference Program

AIAI 2009

5TH IFIP CONFERENCE ON ARTIFICIAL INTELLIGENCE APPLICATIONS & INNOVATIONS

Invited speakers

Nikolaos Bourbakis
Washington State University, USA

Dominic Palmer-Brown
Metropolitan University London, UK

Tutorials

Kostas Karpouzis
National Technical University of Athens, Greece

Nada Matta
University of Technology of Troyes, France

Conference Organization

General Co-Chairs

Ioannis Vlahavas
Aristotle University of Thessaloniki, Greece

Max Bramer
University of Portsmouth, UK

Program Committee Chair

Lazaros Iliadis
Democritus University of Thrace, Greece

Workshop Chair

Nick Bassiliades
Aristotle University of Thessaloniki, Greece

April 23-25, 2009

Capsis Hotel Conference Centre
Thessaloniki, Greece

Organizing Institutions

ifip
International Federation for Information Processing

University of Macedonia

Aristotle University of Thessaloniki

Democritus University of Thrace

Information

http://delab.csd.auth.gr/aiai2009

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Welcome to AIAI-2009

Welcome to the 5th IFIP Conference on Artificial Intelligence Applications & Innovations (AIAI 2009) being held from 23rd till 25th of April, in Thessaloniki, Greece. The IFIP AIAI 2009 conference is co-organized by the Aristotle University of Thessaloniki, by the University of Macedonia Thessaloniki and by the Democritus University of Thrace. AIAI 2009 is the official conference of the WG12.5 "Artificial Intelligence Applications" working group of IFIP TC12 the International Federation for Information Processing Technical Committee on Artificial Intelligence (AI).

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.

The AIAI conference is a conference growing and maintaining high standards of quality. The purpose of the 5th IFIP AIAI Conference is to bring together researchers, engineers and practitioners interested in the technical advances and business / industrial applications of intelligent systems. AIAI 2009 is not only focused in providing in-sights on how AI can be implemented in real world applications, but it also covers innovative methods, tools and ideas of AI on architectural and algorithmic level.

The response to the 'Call for Papers' was overwhelming resulting in the submission of 113 high quality full papers. All contributions were reviewed by two independent academic referees. A third referee was consulted in some cases with conflicting reviews after the submission of the reviews was officially over. Finally, 30 full papers and 32 short papers were accepted. This amounts to an acceptance rate of 27% for full papers and 28% for short ones. The authors of the accepted papers come from 19 countries from all over the world. The collection of papers that were included in the proceedings offer stimulating insights into emerging applications of AI and describe advanced prototypes, systems, tools and techniques. The 2009 AIAI Proceedings will interest not only academics and researchers, but also IT professionals and consultants by examining technologies and applications of demonstrable value.

Two Keynote speakers are invited to make interesting presentations on innovative and state of the art aspects of AI:

- **Professor Nikolaos Bourbakis, Associate Dean for Engineering Research, Distinguished Professor of Information Technology and Director of the ATR Centre at Wright State University will talk about "*Synergies of AI Methods for Robotic Planning & Grabbing, Facial Expressions Recognition, and Blind's Navigation*".**
- **Professor Dominic Palmer-Brown, Dean, Metropolitan University London, UK, will talk about "*Neural Networks for Modal and Virtual Learning*".**

The AIAI 2009 conference comprises of the following twelve (12) main thematic Sessions:

- **Intelligent Human-Computer Interaction**
- **Decision Support Systems**

- **Machine Sensing Algorithms & Applications**
- **Intelligent Medical Applications**
- **Fuzzy Logic Techniques & Applications**
- **Intelligent Commerce Applications**
- **Knowledge Representation & Reasoning**
- **Intelligent Web Applications**
- **Multi-Agent Techniques & Applications**
- **Machine Learning Algorithms**
- **Machine Learning Applications**
- **Knowledge Based Applications**

Also, four (4) Workshops, on various specific AI application areas, are being held during the main conference, with parallel sessions:

- **Workshop on Biomedical Informatics and Intelligent Approaches in the Support of Genomic Medicine (BMIINT)**
- **Workshop on Artificial Intelligence Approaches for Biometric Template Creation and Multibiometrics Fusion (ArtIBio)**
- **2nd Workshop on Artificial Intelligence Techniques in Software Engineering (AISEW 2009)**
- **Workshop on Artificial Intelligence Applications in Environmental Protection (AIAEP)**

Finally, two (2) tutorials give special insight on modern topics of AI:

- **Multimodal Emotion Recognition in HCI Environments, given by Dr. Kostas Karpouzis**
- **Capitalization of Collective Knowledge: from Knowledge Engineering to Computer Supported Cooperative Work and Socio-Semantic Web, given by Dr. Nada Matta**

The wide range of topics and high level of contributions will surely guarantee a very successful conference. We express our special thanks to all who have contributed to the organization and scientific contents of this conference, first to the authors and reviewers of the papers, as well as the members of the Program and Organization Committees.

Especially, we would like to express our thanks to the Program Committee chair, Associate Professor Lazaros Iliadis, to the Workshop-Tutorial chair, Assistant Professor Nick Bassiliades, and to the Organizing Committee chair Professor Yannis Manolopoulos, for their crucial help in organizing this event. Special thanks are also due to the co-editors of the proceedings, Assistant Professor Ilias Maglogiannis and Lecturer Gregory Tsoumakas.

Over the next few days, we hope that everyone participating in the conference will expand their knowledge and will find useful resources to help with their ongoing work. Most importantly, we hope that by the end of the conference everyone will have found new friends and partners with whom to work towards new research achievements.

Thessaloniki, April 2009

Ioannis Vlahavas
Max Bramer

Conference Officers and Program Committee Members

General Co-Chairs
Ioannis Vlahavas, Aristotle University of Thessaloniki, Greece
Max Bramer, University of Portsmouth, UK

Program Committee Chair
Lazaros Iliadis, Democritus University of Thrace, Greece

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D. Rafailidis, Aristotle University of Thessaloniki

Workshop Organizers

Workshop on Biomedical Informatics and Intelligent Approaches in the Support of Genomic Medicine (BMIINT)
George Potamias, Foundation for Research & Technology - Hellas (FORTH)
Vassilis Moustakis, Technical University of Crete, Greece

Workshop on Artificial Intelligence Approaches for Biometric Template Creation and Multibiometrics Fusion (ArtIBio)
Nicolas Tsapatsoulis, Cyprus University of Technology
Bernadette Dorizzi, Institute National des Telecommunications, France
Anixi Antonakoudi, Philips College, Cyprus
Constantinos Pattichis, University of Cyprus

2nd Workshop on Artificial Intelligence Techniques in Software Engineering (AISEW 2009)
Ioannis Stamelos, Aristotle University of Thessaloniki, Greece
Michalis Vazirgiannis, Athens University of Economics & Business, Greece

Workshop on Artificial Intelligence Applications in Environmental Protection (AIAEP)
Mihaela Oprea, University Petroleum-Gas of Ploiesti, Romania
Nick Bassiliades, Aristotle University of Thessaloniki, Greece

Tutorial Presenters

Multimodal Emotion Recognition in HCI Environments
Kostas Karpouzis, National Technical University of Athens, Greece

Capitalization of Collective Knowledge: from Knowledge Engineering to Computer Supported Cooperative Work and Socio-Semantic Web
Nada Matta, University of Technology of Troyes, France

About IFIP

The International Federation for Information Processing (IFIP) is a non-governmental, not-for-profit umbrella organisation of national learned societies working in the field of Information Technology. It was established in 1960 under the auspices of UNESCO as a result of the first World Computer Congress held in Paris in 1959.

IFIP:

- **Is the leading multinational, non-political organisation in Information & Communications Technologies and Sciences, recognised by United Nations and other world bodies**
- **Comprises IT Societies from 56 countries or regions, covering all 5 continents with a total membership of over half a million**
- **Links more than 3500 scientists from Academia and Industry, organised in 107 Working Groups reporting to 13 Technical Committees**
- **Provides an unparalleled global scientific coverage from theoretical foundations of IT to the relationship between IT and society including hardware, software, and networking technologies**
- **Addresses issues critical to developing countries, such as the application of IT in health, fighting poverty, access to education, environment.**

Within IFIP IT member societies find a forum for sharing experience, and discussing challenges and opportunities. TCs and WGs contribute to, and often lead, progresses in the state-of-knowledge and state-of-the-art: voluntary work of its WG members is catalysed into creative synergy, with societal relevance.

The "Artificial Intelligence Applications" working group 12.5, which belongs to the TC12 IFIP Technical Committee on Artificial Intelligence (AI), was established in 1993 and was then called "Knowledge Oriented Development of Applications". It was renamed "Artificial Intelligence Applications" in 2003. Its aim is to explore the use of Artificial Intelligence techniques for applications development and covers all areas of application in which Artificial Intelligence techniques can give benefits to users.

Techniques for application development include the following:

- **Conceptual frameworks for application specification and design**
- **User interface design**
- **Integration of AI software and systems with conventional databases, programming languages, and operating systems**
- **Related research issues such as knowledge acquisition, learning, validation and implementation techniques.**

WG 12.5 organizes a worldwide "applications and innovations" conference (AIAI), plus a number of smaller applications-oriented conferences or workshops at a variety of locations each year. Past AIAI conferences were held in Toulouse, France (2004), Beijing, China (2005), Athens, Greece (2006, 2007), and finally this year in Thessaloniki, Greece.

WG 12.5 is led by Prof. Max Bramer (University of Portsmouth, UK), Group Chair, and the Group's secretary Prof. John Debenham (University of Technology, Sydney, Australia).

Conference Venue

AIAI-2009 will be hosted by the Capsis Hotel Conference Centre (www.capsishotel.gr) which is located in the city of Thessaloniki the capital of Macedonia region in northern Greece. A block of rooms has been reserved for the conference registrants at Capsis Hotel, the conference venue. The prices per night are 85 euros for single rooms and 105 for double rooms. Prices include buffet breakfast, use of gym, free internet at business center, wi-fi, stay late (check out at 17.00 without charge) and taxes.

For reservations, you are kindly directed to Capsis Hotel at
Tel: +30-2310-596800
Fax: +30-2310-510555
Email: reservations@capsishotel.gr
indicating that you are registrant for the AIAI'2009 conference.

Capsis hotel is located 17Km from the Airport "Macedonia" of Thessaloniki and is very near at the port and the train station of Thessaloniki. City bus and taxi stations are located near the hotel.

General Conference Information

Registration
The conference registration will take place each day of the conference (23rd-25th April) 8.30am-13.30am.

Help and Support: If you need help or additional information during the symposium please contact one of the AIAI-2009 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: Thessaloniki and Greece are located in the Eastern European Summer Time (EEST). During the AIAI-2009 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 regular papers 20 minutes**
- **For short papers 15 minutes**

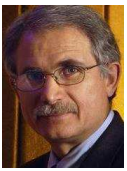
Please be considerate to the other speakers: keep to the allowed time.

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.

Invited Talks

Plenary Session 1: Synergies of AI Methods for Robotic Planning & Grabbing, Facial Expressions Recognition, and Blind's Navigation

Thursday, April 30, 2009, 9.30 – 11.00 am



Nikolaos Bourbakis

OBR Distinguished Professor of Information Technology
Wright State University

Abstract

Artificial Intelligent (AI) techniques have reached an acceptable level of maturity as single entities and their application to small and simple problems have offered impressive results. For large scale and complex problems, however, these AI methods individually are not always capable to offer satisfactory results. Thus, synergies of AI methods are used to overcome difficulties and provide solutions to large scale complex problems.

This talk presents several synergies of AI methods for solving different complex problems. In particular, the first synergy combines AI planning, stochastic Petri-nets and neural nets for coordinating two robotic hands for boxes placement, and neuro-fuzzy nets for robotic hand grabbing. The second synergy is based on neural color constancy for skin detection and enriched with fuzzy image segmentation & regions synthesis and local global (LG) graphs method for biometrics application by detecting faces and recognizing facial expressions. The third synergy uses several image processing and computer vision techniques in combination with formal modeling of vibrations to offer to the blind 3D sensations of the surrounding space for safe navigation. Examples from other synergistic methodologies, such as, body motion-tracking and robotic 3D brain surgery are also presented.

About the speaker

Nikolaos G. BOURBAKIS (IEEE Fellow) received his PhD in computer engineering and informatics in 1983, Patras, Greece. He currently is the Associate Dean for Engineering Research, a Distinguished Professor of Information Technology and the Director of the ATR Center at WSU. He has directed several research projects (Applied AI, Image Processing & Machine Vision, Visual Autonomous Navigation, Information Security, Bio-Informatics, Biomedical Engineering) funded by government and industry, he has graduated 14 PhD and 30 MS students, and he has published 300 papers in International refereed Journals, Conference proceedings and book-chapters. Previous working places: SUNY, TUC, IBM, GMU, UP. He is actively involved as an Associate Editor in several IEEE and International Journals and Founder/General/Program Chair in numerous International IEEE Conferences (ICTAI, BIBE, IIS, INBS, NLP, IRS, JIS, RAT, etc). He is the EIC of the

Artificial Intelligence Tools Int. Journal (WSP). He is an IEEE Computer Society Distinguished Speaker, and NSF University Research Programs Evaluator, an IEEE Computer Society Golden Core Member. He has received several high prestigious awards, some of them are: IBM Author recognition Award 1991, IEEE Computer Society Outstanding Contribution Award 1992, IEEE Outstanding Paper Award ATC 1994, IEEE Computer Society Technical Research Achievement Award 1998, IEEE I&S Outstanding Leadership Award 1998, IEEE ICTAI 10 years Research Contribution Award 1999, PRS Best Selection Papers Recognition 1999, IEEE BIBE Leadership Award 2003, ASC Recognition Award 2005, SETN Honorary Membership 2006, University of Patras Honorary Recognition Degree 2007.

Plenary Session 2: Neural Networks for Modal and Virtual Learning
Friday, April 24, 2009, 9.30 – 11.00 am

Dominic Palmer-Brown

Dean Faculty of Computing
London Metropolitan University

Abstract

This talk will explore the integration of learning modes into a single neural network structure in order to overcome the inherent limitations of any given mode (for example some modes memorise specific features, others average across features, and both approaches may be relevant according to the circumstances). Inspiration come from neuroscience, cognitive science and human learning, where it is impossible to build a serious model of learning without consideration of multiple modes; and motivation also comes from non-stationary input data, or time-variant learning objectives, where the optimal mode is a function of time. Several modal learning ideas will be presented, including the Snap-Drift Neural Network which toggles its learning (across the network or on a neuron-by-neuron basis) between two modes, either unsupervised or guided by performance feedback (reinforcement), and an adaptive function neural network (ADFUNN), in which adaptation applies simultaneously to both the weights and the individual neuron activation functions. The talk will also focus on a virtual learning environment example that involves the modal learning neural network identifying patterns of student learning that can be used to target diagnostic feedback that guides the learner towards increased states of knowledge.

About the speaker

Dominic Palmer-Brown is professor of neural computing and Dean of the Faculty of Computing in the London Metropolitan University. His research covers neural network learning methods for processing language, modelling interaction and data mining. He was the neural network specialist on a 5 year UN/NERC/DoE funded crops data analysis project involving 15 countries, ending in 2000, and has supervised 12 PhDs to completion. He was selected as Editor of the journal Trends in Cognitive Sciences by Elsevier Science London in 2001 and has published about 75 papers overall. He was keynote invited speaker at the European Simulation Multiconference 2003, and at The 10th Int. Conference on Engineering Applications of Neural Networks, 2007, WSEAS Int Con. On Neural Networks 2008, and has published in many journals including IEEE Transactions in Neural Networks, Neurocomputing, Information Sciences and Connection Science.

The program at a glance

	Thursday 23 April		
8:30-9:30	*Registration*		
9.30-11.00	**Room A**		
	Plenary 1: Synergies of AI Methods for Robotic Planning & Grabbing, Facial Expressions Recognition, and Blind's Navigation		
11.00-11.30	*Coffee Break*		
11.30-13.00	**Room A**	**Room B**	
	Session 1: Intelligent Human-Computer Interaction	**Session 2:** Decision Support Systems	
13.00-14.30	*Lunch*		
14.30-16.00	**Room A**	**Room B**	
	Session 3: Machine Sensing Algorithms & Applications	**Session 4:** Intelligent Medical Applications	
16.00-16.30	Coffee Break		
16.30-18.00	**Room A**	**Room B**	
	Session 5: Fuzzy Logic Techniques & Applications	**Session 6:** Intelligent Commerce Applications	

	Friday 24 April		
8:30-9:30	*Registration*		
9.30-11.00	**Room A**		
	Plenary 2: Neural Networks for Modal and Virtual Learning		
11.00-11.30	*Coffee Break*		
11.30-13.00	**Room A**	**Room B**	**Room C**
	Session 7: Knowledge Representation & Reasoning	**Workshop 1: BMIINT** *Session 1*	**Tutorial 1:** Multimodal Emotion Recognition in HCI Environments
13.00-14.30	*Lunch*		
14.30-16.00	**Room A**	**Room B**	**Room C**
	Session 8: Intelligent Web Applications	**Workshop 1: BMIINT** *Session 2*	**Workshop 2: ArtIBio** *Session 1*
16.00-16.30	Coffee Break		
16.30-18.00	**Room A**	**Room B**	**Room C**
	Session 9: Multi-Agent Techniques & Applications	**Workshop 1: BMIINT** *Roundtable*	**Workshop 2: ArtIBio** *Session 2*
21.00-23.00	*Gala Dinner*		

	Saturday 25 April		
8:30-9:30	*Registration*		
9.30-11.00	**Room A**	**Room B**	
	Session 10: Machine Learning Algorithms	**Tutorial 2:** Capitalization of Collective Knowledge: from Knowledge Engineering to Computer Supported Cooperative Work and Socio-Semantic Web	
11.00-11.30	*Coffee Break*		
11.30-13.00	**Room A**	**Room B**	**Room C**
	Session 11: Machine Learning Applications	**Workshop 3: AISEW 2009** *Session 1*	**Workshop 4: AIAEP** *Session 1*
13.00-14.30	*Lunch*		
14.30-16.00	**Room A**	**Room B**	**Room C**
	Session 12: Knowledge Based Applications	**Workshop 3: AISEW 2009** *Session 2*	**Workshop 4: AIAEP** *Session 2*
16.00-16.30	**Room A**		
	Closing session		

Room A: THEODORA

Room B: VERGINA I

Room C: VERGINA II

Conference Sessions

Plenary Session 1: Invited Talk

Synergies of AI Methods for Robotic Planning & Grabbing, Facial Expressions Recognition, and Blind's Navigation
Nikolaos Bourbakis

Plenary Session 2: Invited Talk

Neural Networks for Modal and Virtual Learning
Dominic Palmer-Brown

Tutorial 1:

Multimodal Emotion Recognition in HCI Environments
Kostas Karpouzis

Tutorial 2:

Capitalization of Collective Knowledge: from Knowledge Engineering to Computer Supported Cooperative Work and Socio-Semantic Web
Nada Matta

Session 1: Intelligent Human-Computer Interaction

Performance Evaluation of a Speech Interface for Motorcycle Environment (regular)
Iosif Mporas, Todor Ganchev, Otilia Kocsis, Nikos Fakotakis

Learning Rules from User Behaviour (regular)
Domenico Corapi, Oliver Ray, Alessandra Russo, Arosha Bandara, Emil Lupu, Domenico

MobiAct: Supporting Personalized Interaction with Mobile Context-Aware Applications (regular)
Adrian Stoica, Nikolaos Avouris

Semi-tacit Adaptation of Intelligent Environments (short)
Tobias Heinroth, Achilles Kameas, Hani Hagras, Yacine Bellik

Multi-modal System Architecture for Serious Gaming (short)
Otilia Kocsis, Todor Ganchev, Iosif Mporas, George Papadopoulos, Nikos Fakotakis

Session 2: Decision Support Systems

A Hybrid Technology for Operational Decision Support in Pervasive Environments (regular)
Alexander Smirnov, Tatiana Levashova, Nikolay Shilov, Alexey Kashevnik

An Expert System Based on Parametric Net to Support Motor Pump Multi-Failure Diagnostic (regular)
Flavia Bernardini, Ana Garcia, Inhauma Ferraz

Providing Assistance during Decision-making Problems Solving in an Educational Modelling Environment (regular)
Panagiotis Politis, Ioannis Partsakoulakis, George Vouros, Christos Fidas

A Fuzzy Knowledge-based Decision Support System for Tender Call Evaluation (short)
Panos Alexopoulos, Manolis Wallace, Konstantinos Kafentzis, Aristodimos Thomopoulos

Extended CNP Framework for the Dynamic Pickup and Delivery Problem Solving (short)
Zoulel Kouki, Besma Fayech Chaar, Mekki Ksouri

Session 3: Machine Sensing Algorithms & Applications

Computational Modeling of Visual Selective Attention Based on Correlation and Synchronization of Neural Activity (regular)
Kleanthis Neokleous, Christos Schizas

Combining Gaussian Mixture Models and Support Vector Machines for Relevance Feedback in Content Based Image Retrieval (regular)
Apostolos Marakakis, Nikolaos Galatsanos, Aristidis Likas, Andreas Stafylopatis

Two Levels Similarity Modelling: a Novel Content Based Image Clustering Concept (short)
Amar Djouak, Hichem Maaref

Intelligent Modification of Colours in Digitized Paintings for Enhancing the Visual Perception of Color-blind Viewers (short)
Paul Doliotis, George Tsekouras, Christos-Nikolaos Anagnostopoulos, Vassilis Athitsos

Locating an Acoustic Source Using a Mutual Information Beamformer (short)
Osama Alrabadi, Fotios Talantzis, Anthony Constantinides

Session 4: Intelligent Medical Applications

Background Extraction in Electron Microscope Images of Artificial Membranes (regular)
Argyro Karathanou, Jean-Luc Buessler, Hubert Kihl, Jean-Philippe Urban

Enhanced Human Body Fall Detection Utilizing Advanced Classification of Video and Motion Perceptual Components (regular)
Charalampos Doukas, Ilias Maglogiannis, Nikos Katsarakis, Aristodimos Pneumatikakis

An Evolutionary Technique for Medical Diagnostic Risk Factors Selection (regular)
Dimitrios Mantzaris, George Anastassopoulos, Lazaros Iliadis, Adam Adamopoulos

Heterogeneous Data Fusion to Type Brain Tumor Biopsies (short)
Vangelis Metsis, Heng Huang, Fillia Makedon, Aria Tzika

Automatic Knowledge Discovery and Case Management: an Effective Way to Use Databases to Enhance Health Care Management (short)
Luciana Kobus, Fabricio Enembreck, Edson Scalabrin, Joao Dias, Sandra Honorato

Session 5: Fuzzy Logic Techniques & Applications

An Adaptive Resource Allocating Neuro-Fuzzy Inference System with Sensitivity Analysis Resource Control (regular)
Minas Pertselakis, Natali Raouzaiou, Andreas Stafylopatis

An Intelligent Fuzzy Inference System for Risk Estimation Using Matlab Platform: the Case of Forest Fires in Greece (regular)
Theocharis Tsataltzinos, Lazaros Iliadis, Spartalis Stefanos

A Formal Fuzzy Framework for Representation and Recognition of Human Activities (short)
Suphot Chunwiphat, Patrick Reignier, Augustin Lux

Fuzzy Dependencies between Preparedness and Learning Outcome (short)
Sylvia Encheva, Sharil Tumin

Backing-up Fuzzy Control of a Truck-trailer Equipped with a Kingpin Sliding Mechanism (short)
Georgios Siamantas, Stamatis Manesis

Session 6: Intelligent Commerce Applications

Certified Trust Model (regular)
Vanderson Botelho, Fabricio Enembreck, Braulio Avila, Edson Scalabrin, Hilton Azevedo

Automated Product Pricing Using Argumentation (regular)
Nikolaos Spanoudakis, Pavlos Moraitis

A Hybrid Approach for Improving Prediction Coverage of Collaborative Filtering (regular)
Manolis Vozalis, Angelos Markos, Konstantinos Margaritis

User Recommendations Based on Tensor Dimensionality Reduction (regular)
Panagiotis Symeonidis

Adaptive Electronic Institutions for Negotiations (short)
Manolis Sardis, George Vouros

Session 7: Knowledge Representation & Reasoning

Sensing Inertial and Continuously-changing World Features (regular)
Theodore Patkos, Dimitris Plexousakis

Alternative Strategies for Conflict Resolution in Multi-Context Systems (regular)
Antonis Bikakis, Grigoris Antoniou, Panayiotis Hassapis

Towards Predicate Answer Set Programming via Coinductive Logic Programming (regular)
Richard Min, Ajay Bansal, Gopal Gupta

TELIOS: a Tool for the Automatic Generation of Logic Programming Machines (short)
Alexandros Dimopoulos, Christos Pavlatos, George Papakonstantinou

A Logic-based Approach to Solve the Steiner Tree Problem (short)
Mohamed El Bachir Menai

Session 8: Intelligent Web Applications

Revealing Paths of Relevant Information in Web Graphs (regular)
George Kouzas, Vassileios Kolias, Ioannis Anagnostopoulos, Eleftherios Kayafas

On the Combination of Textual and Semantic Descriptions for Automated Semantic Web Service Classification (regular)
Ioannis Katakis, Georgios Meditskos, Grigorios Tsoumakas, Nick Bassiliades, Ioannis Vlahavas

Preferential Infinitesimals for Information Retrieval (regular)
Maria Chowdhury, Alex Thomo, William Wadge

OntoLife: an Ontology for Semantically Managing Personal Information (short)
Eleni Kargioti, Efstratios Kontopoulos, Nick Bassiliades

Visualizing RDF Documents (short)
Aris Athanassiades, Efstratios Kontopoulos, Nick Bassiliades

Session 9: Multi-Agent Techniques & Applications

A Multi-agent Task Delivery System for Balancing the Load in Collaborative Grid Environment (short)
Mauricio Paletta, Pilar Herrero

An Argumentation Agent Models Evaluative Criteria (short)
John Debenham

ASIC Design Project Management Supported by Multi Agent Simulation (short)
Jana Blaschke, Christian Sebeke, Wolfgang Rosenstiel

MEDICAL_MAS: an Agent-Based System for Medical Diagnosis (short)
Mihaela Oprea

Experimental Evaluation of Multi-Agent Ontology Mapping Framework (short)
Miklos Nagy, Maria Vargas-Vera

AIR_POLLUTION_Onto: an Ontology for Air Pollution Analysis and Control (short)
Mihaela Oprea

Session 10: Machine Learning Algorithms

Multi-Source Causal Analysis: Learning Bayesian Networks from Multiple Datasets (regular)
Ioannis Tsamardinos, Asimakis P. Mariglis

Model Identification in Wavelet Neural Networks Framework (regular)
Achilleas Zapranis, Antonis Alexandridis

Reconstruction-based Classification Rule Hiding through Controlled Data Modification (regular)
Aliki Katsarou, Aris Gkoulalas-Divanis, Vassilios Verykios

A Lazy Approach for Machine Learning Algorithms (short)
Ines M. Galvan, Jose M. Valls, Nicolas Lecomte, Pedro Isasi

GF-Miner: a Genetic Fuzzy Classifier for Numerical Data (short)
Vicky Tsikolidaki, Nikos Pelekis, Yannis Theodoridis

Session 11: Machine Learning Applications

Mining Patterns of Lung Infections in Chest Radiographs (regular)
Spyros Tsevas, Dimitris Iakovidis, George Papamichalis

Confidence Predictions for the Diagnosis of Acute Abdominal Pain (regular)
Harris Papadopoulos, Alex Gammerman, Volodya Vovk

Computer Log Anomaly Detection Using Frequent Episodes (short)
Perttu Halonen, Markus Miettinen, Kimmo Hätönen

A Genetic Algorithm for the Classification of Earthquake Damages in Buildings (short)
Peter-Fotios Alvanitopoulos, Ioannis Andreadis, Anaxagoras Elenas

Mining Retail Transaction Data for Targeting Customers with Headroom - a Case Study (short)
Madhu Shashanka, Michael Giering

Session 12: Knowledge Based Applications

Behaviour Recognition Using the Event Calculus (regular)
Alexander Artikis, George Paliouras

MSRS - Critique on its Usability via a Path Planning Algorithm Implementation (regular)
George Markou, Ioannis Refanidis

A Knowledge Based System for Translating FOL Formulas into NL Sentences (short)
Aikaterini Mpagouli, Ioannis Hatzilygeroudis

Managing Diagnosis Processes with Interactive Decompositions (short)
Quang-Huy Giap, Stéphane Ploix, Jean-Marie Flaus

Defining a Task's Temporal Domain for Intelligent Calendar Applications (short)
Anastasios Alexiadis, Ioannis Refanidis

Workshop Sessions

Workshop 1: Workshop on Biomedical Informatics and Intelligent Approaches in the Support of Genomic Medicine (BMIINT)

Welcome note

The AIAI2009/BMIINT workshop: Scope and overview of presentations
Vassilis Moustakis and George Potamias

Session 1: Integration of Biomedical Information & Data Sources

Homogenising access to heterogeneous biomedical data sources
Erwin Bonsma and Jeroen Vrijnsen

COMBIOMED: A Cooperative Thematic Research Network on COMputational BIOMEDicine in Spain
Fernando Martin-Sanchez, Victoria Lopez-Alonso, Isabel Hermosilla-Gimeno, Guillermo Lopez-Campos, and the COMBIOMED Network

Building a System for Advancing Clinico-Genomic Trials on Cancer
Stelios Sfakianakis, Norbert Graf, Alexander Hoppe, Stefan Ruping, Dennis Wegener, Lefteris Koumakis, and George Zacharioudakis

Unification of heterogeneous data towards the prediction of oral cancer reoccurrence
Konstantinos P. Exarchos, Yorgos Goletsis, Dimitrios I. Fotiadis

Cross-platform integration of transcriptomics data
Georgia Tsiliki, Marina Ioannou and Dimitris Kafetzopoulos

Session 2: Mining Clinico-Genomic Data Sources

A Simple Algorithm Implementation for Pattern-Matching with Bounded Gaps in Genomic and Proteomic Sequences, on the Grid EGEE Platform, using an intuitive User Interface
Vegoudakis K. I., Margaritis K. G., Maglaveras N.

Discovery of Genotype-to-Phenotype Associations: A Grid-enabled Scientific Workflow Setting
Lefteris Koumakis, Stelios Sfakianakis, Vassilis Moustakis, and George Potamias

Method for relating inter-patient gene copy numbers variations with gene expression via gene influence networks
Sylvain Blachon, Gautier Stoll, Carito Guziolowski, Andrei Zinovyev, Emmanuel Barillot, Anne Siegel and Ovidiu Radulescu

Revealing Disease Mechanisms via Coupling Molecular Pathways Scaffolds and Microarrays: A Study on the Wilm's Tumor Disease
Alexandros Kanterakis, Vassilis Moustakis, Dimitris Kafetzopoulos, and George Potamias

Roundtable discussion: 'hot;-topics, roadmap, collaborations …

Workshop 2: Workshop on Artificial Intelligence Approaches for Biometric Template Creation and Multibiometrics Fusion (ArtIBio)

Session 1

Behavioral biometrics (invited speech)
Dimitrios Tzovaras, ITI/CERTH

POLYBIO Multibiometrics database: Contents, description and interfacing platform
Anixi Antonakoudi, Anastasis Kounoudes, Zenonas Theodosiou

Facial Biometric Templates and Aging: Problems and Challenges for Artificial Intelligence
Andreas Lanitis

Applied surveillance using biometrics on Agents infrastructures
Manolis Sardis, Vasilis Anagnostopoulos, Nikos Doulamis

Session 2

Gaussian Mixture Model Coupled with Independent Component Analysis for Palmprint Verification
Raghavendra.R, Bernadette Dorizzi, Ashok Rao, Hemantha Kumar G.

Support Vector Machines for Dynamic Biometric Handwriting Classification
Tobias Scheidat, Marcus Leich, Mark Alexander, Claus Vielhauer

Palm geometry biometrics: A score-based fusion approach
Nicolas Tsapatsoulis, Constatinos Pattichis

Unsupervised Human Members Tracking Based on an Silhouette Detection and Analysis Scheme
Costas Panagiotakis, Anastasios Doulamis

Workshop 3: 2nd Workshop on Artificial Intelligence Techniques in Software Engineering (AISEW 2009)

Welcome note

Introduction to AISEW
I. Stamelos

Session 1: AI in SW Development

Semantic annotation, publication and discovery of Java software components: an integrated approach
Zinon Zygkostiotis, Dimitris Dranidis, Dimitris Kourtesis

Quality Classifiers for Open Source Software Repositories
George Tsatsaronis, Maria Halkidi, Emmanouel Giakoumakis

A probabilistic Approach for Change Impact Prediction in Object-Oriented Systems
M.K. Abdi, H. Lounis, H. Sahraoui

Session 2: AI in SW Quality and Management

Improving Evolutionary Test Data Generation with the Aid of Symbolic Execution
M. Papadakis and N. Malevris

Reliable Confidence Intervals for Software Effort Estimation
Harris Papadopoulos, Efi Papatheocharous and Andreas S. Andreou

Bootstrap confidence intervals for regression error characteristic curves evaluating the prediction error of software cost estimation models
Nikolaos Mittas, Lefteris Angelis

Approaching Software Cost Estimation Using an Entropy-Based Fuzzy k-Modes Clustering Algorithm
Efi Papatheocharous, Andreas S. Andreou

Workshop Conclusion

Workshop 4: Workshop on Artificial Intelligence Applications in Environmental Protection (AIAEP)

Invited Talk

Artificial Intelligence Applications in the Atmospheric Environment: Status and Future Trends
Kostas D. Karatzas

Session 1: Applications of machine learning techniques in environmental protection

Hydrological Neural Modeling aided by Support Vector Machines
Lazaros Iliadis, Stefanos Spartalis

Use of AI Techniques for Residential Fire Detection in Wireless Sensor Networks
Majid Bahrepour, Nirvana Meratnia, Paul J. M. Havinga

Estimation of the permeability of granular soils using neuro-fuzzy system
A. Sezer, A.B. Goktepe , S. Altun

A Data Mining System for Estimating a Largesize Matrix for the Environmental Accounting
Ting Yu, Manfred Lenzen, Blanca Gallego, John Debenham

Session 2: Decision support and knowledge-based systems for environmental protection

Autonomous Inspection Of Complex Environments by Means of Semantic Techniques
M. Ziegenmeyer, K. Uhl, J.M. Zöllner, R. Dillmann

Abductive Reasoning in Environmental Decision Support Systems
Franz Wotawa, Ignasi Rodriguez-Roda, Joaquim Comas

Supporting Decision Making in Maritime Environmental Protection with a Knowledge-based Education and Awareness Approach
Konstantinos Kotis, Andreas Papasalouros, Nikitas Nikitakos

Validation of a knowledge-based risk model for biological foaming in anaerobic digestion simulation
J. Dalmau, J. Comas, I. Rodríguez-Roda, E. Latrille, J.P. Steyer

An Environmental Diagnosis Expert System
M. Oprea, D. Dunea

Tutorials

Tutorial 1: Multimodal emotion recognition in HCI environments

Friday, April 24, 2009, 11.30 – 13.00 am

Presenter

Dr. Kostas Karpouzis
Image, Video and Multimedia Systems Lab
National Technical University of Athens
Email: kkarpou@cs.ntua.gr

Description

Research on computational models of emotion and emotion recognition has been in the forefront of interest for more than a decade. The abundance of non-intrusive sensors (mainly cameras and microphones), data and ubiquitous computing power caters for real-time results in areas where this was deemed impossible a few years ago. As a result, emotion recognition and peripheral or related issues (body and hand gesture and gait analysis, speech recognition, eye gaze and head pose related to attention estimation in multi-person environments, etc.) can now benefit from the available resources, as well as the interest shown to these applications from major authorities in psychology like K. Scherer and P. Ekman.

In addition to this, several research initiatives in the EU (TMR, FP5, 6 and 7: ICT, e-Health, Technology-Enhanced Learning and recently Digital Content and Libraries) promote research in this field and encourage researchers to establish strong connections with theoretician via Networks of Excellence (Humaine, Similar, SSPNET) as well as provide tangible results of application that benefit from this technology (IP Callas, STREP Feelix-Growing, STREP Agent-Dysl, etc.) Another indication of the interest in emotion-related research is the fact that papers on affective computing appear in more than 90 conferences across disciplines and almost 30 special issues in high-impact journals have been published or prepared; the momentum is such that more than 500 researchers participate in the Humaine Association (http://emotion-research.net/), a follow-up initiative of the Humaine Network of Excellence which also plans to produce a journal on related topics in association with the IEEE.

Outline

The tutorial will be divided in three axes:

- **Multimodal (What is multimodality? The characteristics and intricacies of multimodal interaction. Available modalities in HCI. Fusing modalities. Handling uncertainty/noise.)**
- **Emotion (Emotion, mood, personality – terminology clarification. Psychological theories of emotion related to HCI. Emotion in interaction – do we need it, can we benefit from it, how is it defined? Computational models of emotion. From signals to signs of emotion. Embodying emotion: robots, interfaces, ECAs.)**
- **Recognition (Databases of natural expressivity. Application scenarios. Unimodal recognition of features from visual and prosody information. Results from processing natural databases. Natural interaction vs. robust recognition. Fallback to less detailed recognition in the presence of noise. From emotional episodes to understanding behaviour. What else can we recognize? What can't we? Open issues in emotion-related research.)**

Tutorial 2: Capitalization of Collective Knowledge: From Knowledge Engineering to Computer Supported Cooperative Work and Socio-Semantic Web

Saturday, April 25, 2009, 9.30 – 11.00 am

Presenter

Nada Matta is a professor at the University of Technology of Troyes. She studies techniques in knowledge engineering and management and especially to handle cooperative activities like design projects. She pursues her PhD in knowledge engineering and Artificial Intelligence at University of Paul Sabatier in collaboration with Thales. She worked for four years at INRIA in projects with Dassault-Aviation and Airbus Industry. She has organized Knowledge Management workshops jointly to IJCAI, ECAI and COOP conferences.
Email: nada.matta@utt.fr

Description

Knowledge Management (KM) is one of the key progress factors in organizations. It aims at capturing explicit and tacit knowledge of an organization in order to facilitate the access, sharing, and reuse of that knowledge as well as creation of new knowledge and organizational learning. KM must be guided by a strategic vision to fulfil its primary organizational objectives: improving knowledge sharing and cooperative work inside the organization; disseminating best practices; improving relationships with the external world; preserving past knowledge of the organization for reuse; improving the quality of projects and innovations; anticipating the evolution of the external environment; and preparing for unexpected events and managing urgency and crisis situations.

Several approaches are used to handle knowledge Management (community of practices, operational learning, knowledge engineering, semantic web, etc.). These approaches help to capture profession knowledge in specific domains. Other type of knowledge produced in cooperative activity (projects, discussions, etc) has to be managed. Approaches from CSCW help to handle this knowledge and to represent its organizational and cooperative dimensions.

We introduce in this tutorial knowledge engineering techniques that help at structuring information and knowledge and we present techniques defined in CSCW to handle design rationale and negotiation. An example of collective knowledge is then defined: Project memory. Approaches that help to keep track project knowledge are then detailed. We extend our tutorial by presenting the socio semantic web approach which helps to represent concepts built collectively in an organization. These approaches can be illustrated in real applications in several domains: design, safety, marketplace, etc.

This tutorial summarizes several years of studies and presents how knowledge engineering and CSCW can help in knowledge management. It opens knowledge management studies on a hard problem to deal with: the dynamic aspect of collective knowledge.

Outline

- ***Knowledge Engineering*. The KE process is a cycle of knowledge extraction and modeling. The model so build is at knowledge level. It explains the "why", "how" and "what" of activities in an organization. A knowledge reference must**

contain these three dimensions. Several approaches have developed techniques (CommonKADS, expertise components, etc.) in order to guide the KE process. These techniques can be viewed as a methodology, languages and vocabulary.

- ***Knowledge Engineering and Knowledge Management.*** **First applications of KE have been the building of knowledge Based Systems. Nowadays, KE techniques are largely applied in Knowledge Management cycle. Knowledge Management (KM) is a notion that has been defined is management sciences. The aim of KM is to capture and use knowledge produced in an organization. The underlying idea is that an organization produced knowledge as same as other products and services. This knowledge has to be managed as a product. The main phases of the lifecycle of KM are: knowledge localization, capitalization, sharing and appropriation. We note also, knowledge evolution and evaluation.**
- **KE techniques allow representing knowledge in a conceptual way that emphasizes roles that play knowledge in an activity. So this type of representation can be useful to extract and share knowledge in an organization. KE techniques are mainly used in knowledge capitalization and sharing. We can note methods like MASK, CommonKADS, REX, etc. These methods allow defining corporate memories. A corporate memory is defined as the "explicit and persistent representation of the knowledge and the information in an organization". We can distinguish several types of memories: profession memory, project memory and organization memory.**
- ***Collective Knowledge*** **is knowledge produced in cooperative activity. This type of knowledge (for instance produced during the realization of a project) has a collective dimension which is in general volatile. The documents produced in a project are not sufficient to keep track of knowledge which even the head of project cannot explain. This dynamic character of knowledge is due to the cooperative problem solving where various ideas are confronted and with a cooperative definition of the produced solution. Organization and negotiation aspects must be considered to represent this type of knowledge. CSCW studies can give some techniques to handle this knowledge. We note specially works on Design Rationale that study negotiation, and organization aspects.**
- ***Design Rationale approaches.*** **Several methods were defined to represent the design rationale in a project. Design rationale is considered as the analysis of the Space of design. These methods can be classified in two principal categories: decision-making driven representation IBIS, and QOC, and problem solving dynamics representation DIPA, DRCS system, etc.**
- ***Project Memory.*** **We present then, project memory as one approach to handle collective knowledge. A project memory is currently defined as experiences learned from project realization. It represents the project environment: context (rules, constraints, techniques, references, etc.), organization (participants, tasks, roles, competencies, etc.) and problem solving (problem definition, design rationale, solutions, etc.). The structure of this memory is detailed and illustrated on an example on safety domain.**
- ***Socio-semantic Web*** **aims at identifying in cooperative activity: How people do to model and to share knowledge (approaches and methods)? In which formal framework they can do it? How computer supported environments can give them a kind of overview of their knowledge? How these environments support the activities of maintenance and update of knowledge? And how they make it possible the use of this knowledge (information retrieval, problem solving, learning...)? A "Centralized co-construction method" is then presented. It supposes a semantic facilitator's intervention in the bootstrap phase. It consists on several negotiation phases in order to define concepts and related attributes corresponding on several topics and point of views in an organization. Tools based on a Hypertopic language and examples of application in Marketplace and design models are presented.**

Thessaloniki

Thessaloniki, named after Alexander's the Great sister, is the second largest city in Greece. Thessaloniki is an industrial and commercial center hosting an annual international trade fair on September, as well as a transportation hub with a major modern port and an international airport connected with near 20 European major towns.

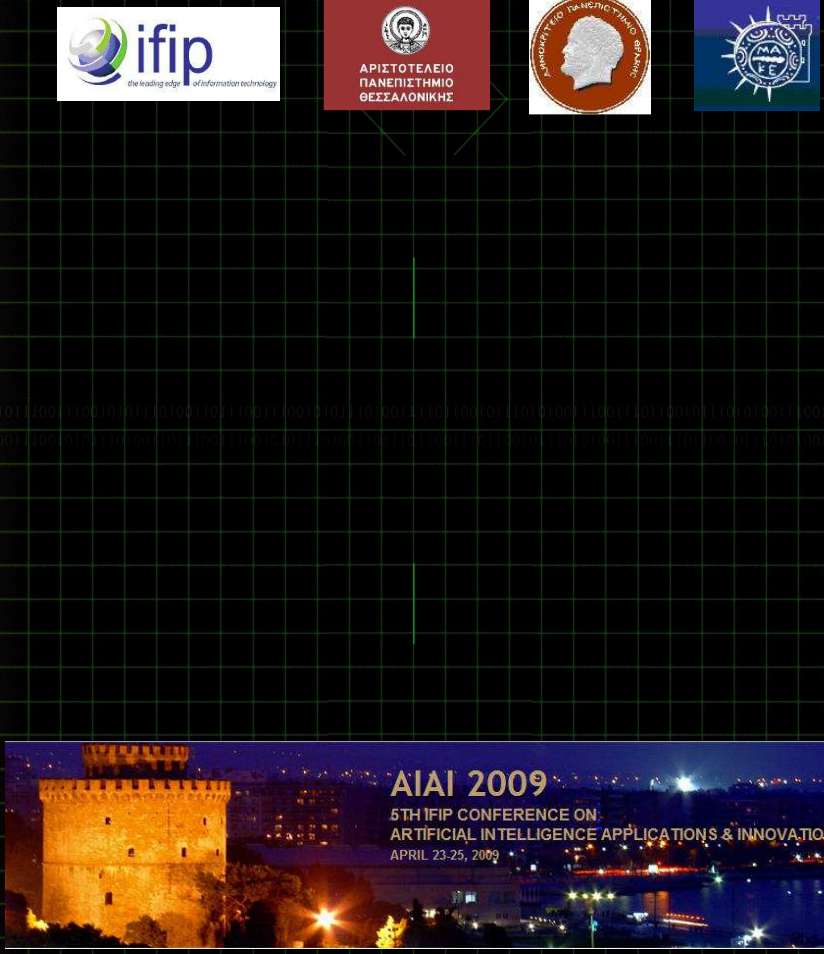
Although largely rebuilt in modern style, Thessaloniki still retains its famous white Byzantine walls, the 15th century White Tower, and a Venetian citadel. The city is famous for its many fine churches, notably those of Hagia Sophia (modeled after its namesake in Constantinople), of St. George, and of St. Demetrius with a catacomb. The ruins of the triumphal arch and the palace of Emperor Galerius are there.

Thessaloniki is also known for its museums: the Archaeological Museum of Thessaloniki, with astonishing Archaic, Classical and Hellenistic sculptures from Thessaloniki and other parts of Macedonia, and also for the Museum of Byzantine Culture, which presents various aspects of life during the byzantine and post-byzantine periods: art, ideology, social structure and religion, as well as how historical changes and the political situation were affecting people's everyday life. The Museum of Byzantine Culture was awarded the Council of Europe Museum Prize for 2005.

Thessaloniki is home of three universities, namely: the Aristotle University, the University of Macedonia and the Alexander Technological Educational Institute.

Thessaloniki is the second largest city of Greece and it has a population of 1000000 people. Its landmark is the White Tower, and there are many important sites within easy reach. Apart from being known as a cosmopolitan and commercial center, it is also known for its exceptional nightlife with the famous Ladadika quarter. The music scene in the city is vibrant and diverse and includes nightclubs, dance halls, discos, cafés and music bars, jazz clubs and clubs, and a wealth of live performances, both musical and theatrical. In half an hour distance from Thessaloniki one can visit the Archaeological site of Vergina (the old capital of ancient Makedonia) and where is the venue of Phillip's tomb (the father of Alexander the great) a site full of remarkable treasures of art and culture. Also in a distance of 70 km from Thessaloniki (45 minutes by car) one can visit mount Olympus (the mountain of the ancient Gods) where "Dion" the holy city of ancient Makedonia is located. It is, after all, the cultural capital of northern Greece!

Organizing Institutions



http://delab.csd.auth.gr/aiai2009/