

EPIA 2007 – 13 th Portuguese Conference in Artificial Intelligence – Hotel de Guimarães, Portugal

December 3-7th 2007

Program and conference co-chairs:

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WORKSHOPS

Second General Artificial Intelligence Workshop (GAIW 2007)

Chairs: José Neves, Manuel Santos and José Machado

The General Artificial Intelligence workshop (GAIW) intends to promote uncovered areas by the remaining workshops, bringing space to the presentation and discussion of theoretical, foundational and application works. The topics of interest were Art and Music; Automated Reasoning; Case-Based Reasoning; Cognitive Modelling; Hybrid systems; Knowledge Representation and Reasoning; Logic Programming; Machine Learning; Mathematical Foundations; Model-Based Reasoning; Natural Language Processing; Perception/Vision; Philosophical Foundations; Planning and Scheduling; and Uncertainty.

This is the second edition of this workshop, after the successful experience in Covilhã, two years ago. This year GAIW received the highest number of submissions of all the workshops, showing that AI research is diverse, rich and innovative. We thank the excellent work of the members of the Program Committee for their excellent reviewing work, sometimes hard due to the high number of submissions.

First Workshop on AI Applications for Sustainable Transportation Systems (AIASTS 2007)

Chairs: Rosaldo Rossetti, José Telhada, Ronghui Liu and Elisabete Arsénio

The Workshop on Artificial Intelligence Applications for Sustainable Transportation Systems, AIASTS for short, is the first event of its genre to be held at the Portuguese Conference on Artificial Intelligence. In its first edition, the AIASTS workshop aims to build an interdisciplinary working platform to discuss current developments and advances of AI techniques in a rather practical perspective, applied to the analysis, implementation and management of sustainable complex systems. One major goal of such an event was to stimulate the submission of contributions that emphasised on how theory and practice could be effectively bridged to solve real-life problems in the specific application domain of contemporary transportation systems.

Transportation systems have always played an imperative role in society. Besides its economical, social, and environmental importance, transportation is also a very challenging domain, especially due to its inherent complexity. It is formed up by both geographically and functionally distributed heterogeneous elements, with different decision-making abilities, collective or individual goals, which make its dynamics rather uncertain. Transportation also plays a major role towards citizen's quality of life. With resources even scarcer and the imposition of uncountable constraints, contemporary transportation has experienced a great revolution within the last two decades, giving rise to the concept of Intelligent Transportation Systems (ITS), with the ability to ensure productivity and mobility by making better use of existing transportation infrastructures. Featuring today's transportation systems with smarter, safer, and more efficient technologies, much of the advance verified in this field is due to AI which plays a key role in ITS. Such a relationship between these two multidisciplinary areas is certainly mutually beneficial, suggesting a wide range of cross-fertilisation opportunities and potential synergisms between the AI community, which devises theory, and transport practitioners that use it in practice. Therefore, the transportation domain can be seen as a natural ground to conceive, develop, test and apply AI techniques, while AI itself is fostered through challenges imposed by the issues that scientists address when applying theory to solve practical problems in ITS.

This workshop is primarily aimed at bringing together the AI community and transportation practitioners to discuss how cutting-edge AI technologies can be effectively applied to improve transportation performance towards more sustainable systems (e.g. greener and smarter transportation). We have encouraged and invited contributions reporting on original research, work under development and

experiments of different AI techniques, such as neural networks, biologically inspired approaches (such as swarm intelligence), evolutionary algorithms (evolutionary programming and genetic algorithms for instance), knowledge-based and expert systems, case-based reasoning, fuzzy logics, intelligent agents and multi-agent systems, support vector regression, data mining and other pattern-recognition and optimisation techniques, to address specific issues in contemporary transportation. A large spectrum of issues, ranging from different modes of transport and their interactions, to intelligent and real-time traffic management and control, from design, operation, and management of logistics systems, to transportation policy, planning, design and management, are some examples of areas where AI techniques may be effectively applied.

Due to its ability to practically link AI theory to such a challenging and important application domain, namely Transportation Systems, the AIASTS workshop is pioneering as a discussion forum in which sustainable transportation systems are made possible through the practical use of Artificial Intelligence.

Third Workshop on Artificial Life and Evolutionary Algorithms (ALEA 2007)

Chairs: Luís Correia and Agostinho Rosa

In the last twenty years, Artificial Life (ALife) and Evolutionary Algorithms (EA) developed from a theoretical biology niche into wide research and application methodology. Recent topics of interest cover work on computer based bio-inspired models for studying natural systems as well as for solving engineering and social problems. In general, self-organisation, emergence and evolution of multicomponent systems are themes within the scope of this workshop. It targets the ALife community, the EA community and researchers working in the overlap of these two areas, from computer science and exact sciences in general to social sciences. The main topics of interest that can be identified are: Genetic Algorithms, Evolutionary Strategies, Evolutionary Programming, Genetic Programming, Classifier Systems, Evolutionary Robotics, Parallel Evolutionary Algorithms, Evolution Dynamics, Artificial Immune Systems, Ant Algorithms, Cultural Algorithms, (Particle) Swarm Algorithms and Systems with emergent properties. Recently self-organisation has been gaining popularity among the management community, which is a clear signal that the ALEA themes are extending over new research areas. ALEA'07 is the third international workshop, held in Portugal, specifically dedicated both to the theory and application of ALife and EA. ALife and EA solutions have been gaining popularity in solving complex problems of different industrial, economical, and scientific domains. These workshops have been good opportunities to gather researchers to present their latest research and to discuss current developments and applications. This year's edition continued the growing interest of previous ones. In ALEA 07 we received thirty submissions. The papers have been selected by rigorous double-blind international peer-review. Due to logistics limitations only 20% of the submissions were accepted for oral presentation. This puts ALEA quality in a very high and demanding level.

As in previous editions the contributions spread over the different subjects covered by ALEA: fundamental research on EA, statistical and theoretical approaches to population dynamics and interactions, immune systems and a wide area of applications ranging from traditional engineering problems to molecular genetics, gaming and telecommunications. Overall, the quality and variety of the contributions provide a solid support for a rich debate expected at ALEA 2007. We are happy to have been part of the organisation of such a successful gathering.

First Workshop on Ambient Intelligence Technologies and Applications (AMITA 2007)

Chairs: Carlos Ramos and Fariba Sadri

Ambient Intelligence (AmI) is a concept introduced by the European Commission's IST Advisory Group (ISTAG) in 2001. Like in the Artificial Intelligence (AI) field we may find some works related with

Ambient Intelligence even before the assignment of the concept name. AmI deals with a new world where computing devices are spread everywhere (ubiquity) allowing humans to interact with physical world environments in an intelligent and unobtrusive way. These environments should be aware of the needs of people, customizing requirements and forecasting behaviours. AmI environments may be highly diverse, such as homes, offices, meeting rooms, schools, hospitals, control centres, transport facilities, tourist attractions, stores, sport installations, music devices, toys, etc. Several AI technologies are important to achieve an intelligent behaviour in AmI systems. Areas like Machine Learning, Computational Intelligence, Planning, Natural Language, Knowledge Representation, Computer Vision, Intelligent Robotics, Incomplete and Uncertain Reasoning and Multi-Agent Systems play an important role in the AmI challenge. On the other hand, AmI concept is not possible to achieve just with AI technologies. Automation, Computer Graphics/Interaction, and Communications are just some of the technologies that we need to include in most of the AmI systems. AI community needs to pay attention to this integration need.

In this workshop we will present some works and systems, discussing issues in Artificial Intelligence topics included in AmI environments. The main idea is to show that it is possible to combine the use of Artificial Intelligence methods and technologies in real-world Ambient Intelligence Scenarios. In this way we observe that “Intelligence” is not just one more keyword when we use the concept of Ambient Intelligence. We are explicitly claiming that the real Ambient Intelligence concept is possible just if Artificial Intelligence methods and technologies are used.

Second Workshop on Building and Applying Ontologies for the Semantic Web (BAOSW 2007)

Chairs: H. Sofia Pinto, Andreia Malucelli, Fred Freitas and Philipp Cimiano

The emergence of the Semantic Web has marked another stage in the evolution of the ontology field. According to Berners-Lee, the Semantic Web is an extension of the current Web in which information is given well-defined meaning, better enabling computers and people to work in cooperation. This cooperation can be achieved by using shared knowledge components. Once ontologies usually play the role of a shared semantic vocabulary in agents’ communication, they have also become a key instrument in developing the Semantic Web. They interweave human understanding of symbols with their machine processability.

This workshop addressed the problems of building and applying ontologies in the Semantic Web as well as the theoretical and practical challenges arising from different applications. We invited and received contributions that enhance the state-of-the-art of creating, managing and using ontologies. The workshop received high quality submissions, which were peer-reviewed by two or three reviewers. We would like to express our sincere gratitude to all the people who helped to bring about BAOSW 07. First of all thanks to the contributing authors, for ensuring the high scientific standard of the workshop and for their cooperation in the preparation of this volume. Special thanks go to the members of the program committee for their professionalism and their dedication in selecting the best papers for the workshop. Finally, we hope the workshop provided its attendees a lively, fruitful and interesting discussion on building and applying ontologies for the Semantic Web.

First Workshop on Business Intelligence (BI 2007)

Chairs: Paulo Cortez and Robert Stahlbock

Nowadays, business organizations are increasingly moving towards decision-making processes that are based on information. Business Intelligence (BI) represents applications, technologies and methods to enhance managerial decision making in public and corporate enterprises from operational to strategic level. On the other hand, Artificial Intelligence (AI) includes several computational technologies that may be useful to improve BI (e.g. Data Mining, Evolutionary Computation, Neural Computing and Intelligent

Agents). Hence, the aim of this workshop is to gather the latest research on BI using AI and promote an open discussion. The list of relevant topics is Methodologies, Architectures or Computational Tools for BI; BI Applications (Data Mining, Optimization, Business Forecasting and Demand Planning, Decision Support Systems, Adaptive BI, Competitive Intelligence, Examples of real-world applications (in Marketing, Sales, Production, Internal Operations or others); AI techniques applied to BI (Data Mining and Machine Learning (Neural Networks, Support Vector Machines, Decision Trees, Random Forests, ...), Evolutionary Computation (Genetic Algorithms, Evolutionary Strategies, Swarm Intelligence, Artificial Immune Systems, ...) and other AI techniques (Intelligent Agents, Fuzzy Logic, ...)); Future trends and challenges for BI. In particular, papers that describe experience and lessons learned from BI projects and/or present business and organizational impacts using AI technologies, were welcome.

Although some of the previous EPIA conferences included workshops with a subset of the BI topics (e.g. extraction of Knowledge from Databases and Warehouses), this is the first edition of the workshop.

First Workshop on Computational Methods in Bioinformatics and Systems Biology (CMBSB 2007)

Chairs: Rui Camacho and Miguel Rocha

The success of bioinformatics in recent years has been prompted by research in molecular biology and molecular medicine in initiatives like the human genome project. The volume and diversification of data has increased so much that it is very hard if not impossible to analyze it by human experts. Systems Biology is a related research area that has been replacing the reductionist view that dominated biology research in the last decades, requiring the coordinated efforts of biological researchers with those related to data analysis, mathematical modelling, computer simulation and optimization.

The growth of large-scale data bases prompts for new computational technology and for research in this arena. Computational methods have been helping in tasks related to knowledge discovery, modelling and optimization tasks. This workshop brings the opportunity to discuss applications of AI exploring the interactions between these fields, Bioinformatics and Systems Biology.

We thank the excellent work of the other members of the organization: Yonghong Peng (University of Bradford, U. K.), Isabel Rocha (Universidade do Minho, Portugal), Nuno Fonseca (Universidade do Porto, Portugal), Kiran Patil (Technical University of Denmark, Denmark), Alexsander Alves (Universidade do Porto, Portugal) and Florentino Fdez-Riverola (Escuela Superior de Ingeniería Informática, Ourense, Spain). And finally we would like also to thank the members of the Program Committee for their excellent reviewing work.

Second Workshop on Intelligent Robotics (IROBOT 2007)

Chairs: Luís Paulo Reis, Nuno Lau, Cesar Analide and Luís Correia

Research in robotics has traditionally emphasized low-level sensing and control tasks, path planning, and actuator design and control. In contrast, several Artificial Intelligence (AI) researchers are more concerned with providing real/simulated robots with higher-level cognitive functions that enable them to reason, act and perceive in an autonomous way in dynamic, inaccessible, continuous and non deterministic environments. Combining results from traditional robotics with those from AI and cognitive science will be thus essential for the future of intelligent robotics.

The 2nd Workshop on Intelligent Robotics took place in Guimarães, Portugal, December 4-6, 2007, as part of EPIA 2007 – 13th Portuguese Conference on Artificial Intelligence. Following the 1st IROBOT held in EPIA 2005 in December 2005, the purpose of the 2nd International Workshop on Intelligent Robotics was to bring together researchers, engineers and other professionals interested in the application of AI techniques in real/simulated robotics to discuss current work and future directions. Predicting an increase in the number and quality of submissions, IROBOT 2007 Program Committee (PC) included

thirty four of the more well-known researchers in the field of Intelligent Robotics from thirteen distinct countries.

The workshop received twenty three submissions from nine countries with Portugal, Germany, Spain and Brazil being the most contributing countries. Submissions covered most of the call for papers topics with emphasis on AI planning for robotics, simulation in robotics, learning and adaptation in robotics, computer vision and object recognition, multi-robot systems, real robots and human-robot interfaces. Each paper was blindly reviewed by three program committee members. As final result of the reviewing process, five full papers were selected for Springer LNCS main volume of the conference proceedings. We would like to thank all the authors who submitted their work and enabled the success of this second edition of IROBOT. Special thanks go also to the Program Committee members who were able to complete the reviewing process in less than two weeks, during August, enabling us to improve the workshop quality, relatively to its first edition, and create evaluation standards for future editions. We hope this Workshop contributed to the promotion of research and development of Artificial Intelligence, which are the main purposes of the EPIA Conferences

Fourth Workshop on Multi-Agent Systems: Theory and Applications (MASTA 2007)

Chairs: Luís Paulo Reis, João Balsa, Paulo Novais and Eugénio Oliveira

The 4th Workshop on Multi-Agent Systems: Theory and Applications (MASTA 2007) took place in Guimarães, Portugal, December 4-6, 2007, as part of EPIA 2007 – 13th Portuguese Conference on Artificial Intelligence. Like in previous editions that took place in 1997, 2001 and 2005, the workshop was a forum for presenting and discussing some of the most recent and original work in the areas of Autonomous Agents and Multi-Agent Systems (MAS). Submission of theoretical, experimental, methodological, and application papers was encouraged, making clear that, more theoretical papers should clarify the significance and relevance of their results to MAS community and, similarly, applied papers should explain both their scientific and technical contributions and include a practical evaluation.

MASTA 2007 Program Committee (PC) was selected to include some well-known researchers in the field of Autonomous Agents and Multi-Agent Systems. Thirty Nine known researchers from fifteen countries belong to the PC. The workshop received twenty submissions from seven countries with Portugal and Brazil being the most contributing countries. Submissions covered a broad spectrum of the Autonomous Agents and Multi-Agent System's areas, including: Multi-Agent Simulation; Cooperation, Coordination and Teamwork; Formal Modelling Methods; Automated Negotiation and Decision Making; Multi-Agent Evolution, Adaptation and Learning; Cognitive Models; Artificial Social Systems; Agent Architectures; and Agent Based Applications.

Although a tight schedule was imposed for completing the reviewing process, each paper was blinded reviewed by at least three program committee members. Very high quality papers were submitted to MASTA 2007. The centralized acceptance process for all EPIA workshops used this year, associated with MASTA standards and tradition as well as its strict and careful reviewing process, made some quality papers being rejected. We would like to thank all the authors who submitted their work and made possible the success of the 4th edition of MASTA. Special thanks go also to the Program Committee members who were able to complete the reviewing process in less than two weeks, during August, enabling us to keep the workshop quality and evaluation standards.

First Workshop on Search Techniques for Constraint Satisfaction (STCS 2007)

Chairs: Francisco Azevedo, Inês Lynce and Vasco Manquinho

Search is essential for solving combinatorial problems in AI. For the usual case where inference based methods are incomplete, search provides the core engine for applications such as hardware verification, planning, or protein folding. Recent advances in Constraint Programming (CP) and Boolean algorithms for Propositional Satisfiability (SAT) have allowed current solvers to perform several orders of magnitude faster than previous ones. New search pruning techniques, learning schemes, data structures for constraint processing and dynamic decision heuristics have proved to be crucial in the advance of solvers now capable of solving much larger instances. As a result, several related areas such as Pseudo-Boolean Optimization (PBO), Satisfiability-Modulo Theories (SMT) and Quantified Boolean Formulas (QBF) have also emerged with new and exciting research work. Additionally, researchers have also proposed new constraint formulations for several well-known problems that are more suited to be dealt by this new generation of solvers. The workshop had this year its first edition. Given the recent remarkable improvements in the field described above, the organizers felt that the EPIA conference would be the perfect forum to bring together researchers working in the area. The workshop aims at bringing together researchers and practitioners from these communities, in order to learn from each other, develop common understandings, and inspire new applications, algorithms and approaches.

The topics of the workshop span practical and theoretical research on search techniques for constraint satisfaction and include but are not limited to: complete and local search algorithms, analysis of search algorithms, search heuristics, search space pruning techniques, problem encodings for combinatorial problems using constraint programming and propositional satisfiability, novel applications using constraint satisfaction components, implementation techniques for constraint satisfaction and combinatorial optimization search algorithms, distributed and parallel algorithms for constraint satisfaction, case studies and empirical results.

The workshop attracted a number of submissions including different techniques and applications for the use of search in the presence of constraints.

Second Workshop on Text Mining and Applications (TEMA 2007)

Chairs: Joaquim Silva, José Gabriel Lopes, Gaël Dias and Vitor Rocio

This workshop contains papers presented in the workshop on Text Mining and Applications (TeMA 2007). It was organized under the auspices of the Portuguese Association for Artificial Intelligence (APPIA), and is held in the framework of the 13th Portuguese Conference on Artificial Intelligence (EPIA 2007). Pure symbolic methods for Language Processing alone are unable to address human languages complexity. Text Mining and Machine Learning techniques applied to text, raw or annotated, brought up new insights and completely shifted the approaches to Human Language Technologies. Both approaches, when duly integrated, bridge the gap between language theories and effective use of languages, and enable important applications. Our aim, with this workshop, is to bring together innovative contributions to fill in this gap and contribute for a deeper knowledge in this field.

TeMA 2007 received 20 paper submissions. This was the second Text Mining workshop in EPIA meetings. The first one was held in 2005, at Covilhã. Then, in 2005, 27 were received. These numbers show the importance of this field and suggest that it should be continued in future EPIA editions.

INVITED SPEAKERS

Pier Luca Lanzi

Evolving Rules to Solve Problems: The Learning Classifier Systems Way



Dipartimento di Elettronica e Informazione
Politecnico di Milano
December 4th, 9h30m, Room 1

Pier Luca Lanzi received the Laurea degree in computer science in 1994 from the Università degli Studi di Udine and the Ph.D. degree in Computer and Automation Engineering from the Politecnico di Milano in 1999. He is an associate professor at the Politecnico di Milano, Dept. of Electronics and Information. His research interests include genetic and evolutionary computation, reinforcement learning, and machine learning. Since 1997 he has been working in the field of genetics-based machine learning and learning classifier systems. He is member of the editorial board of the "Evolutionary Computation Journal" and Editor in chief of SIGEVolution, the ACM Newsletter of SIGEVO, the Special Interest Group on Genetic and Evolutionary Computation.

James Kennedy

Thinkers and Thoughts: Implications of Swarm Intelligence



US Department of Labor, Washington, USA
December 5th, 8h30m, Room 1

James Kennedy is a social psychologist who has been working with the particle swarm algorithm since 1994. He received his Ph.D. in 1992 from the University of North Carolina, and works for a statistical agency in the US federal government in Washington, DC. He has published dozens of articles and chapters on particle swarms and related topics, in both computer-science and social-science journals and conference Proceedings. The Morgan Kaufmann/Academic Press volume, "Swarm Intelligence," by Kennedy and Russell C. Eberhart, is now in its third printing.

Ana Bazzan

Traffic Simulation and Control: challenges and opportunities for agent technology, multiagent systems, and artificial intelligence



Federal University of Rio Grande do Sul
Brazil
December 6th, 8h30m, Room 1

Ana Bazzan received her PhD in Computer Science in 1997 from the Informatik Fakultät at the Univ. of Karlsruhe (IPR institute), in Karlsruhe, Germany. From 1997 to 1998, she had a postdoc research associate position in the Multi-Agent Systems Laboratory at the University of Massachusetts in Amherst, under supervision of Prof. Victor Lesser. There, she was involved in the research project "Enhancing Survivability with Distributed Coordination" (part of DARPA/ITO's Information Survivability program) on Survivability, Intrusion Detection, and Diagnosis. In 1999 she joined the Institute of Informatics at UFRGS (Universidade Federal do Rio Grande do Sul) as an Assistant Professor. Her research group is mainly concerned with Artificial Intelligence and Multi-Agent Systems and ongoing projects include Coordination of Agents, Artificial Life, Distance Learning, BDI (Beliefs, Desire, Intentions) Formalisms, among others. Her own research interests also include: Use of Game-Theoretic Paradigms for Coordination of Agents (Minority Game, Iterated Prisoner's Dilemma, Congestion Games, etc.), Learning in MAS, Agent-based Simulation, Artificial Societies, Complex Systems, Bioinformatics, Traffic Simulation and Control, Pedestrian Simulation, Artificial Life, and Diagnosis. From April 2006 to March 2007 she had an appointment at the University of Würzburg (Germany), in the Lehrstuhl VI of Prof. F. Puppe, as a fellow of the Alexander von Humboldt Stiftung.

Martin Lauer

Neural Reinforcement Learning for Real Robot Applications



Institute of Cognitive Science
University of Osnabrück
Germany
December 7th, 8h30m, Room 1

Martin Lauer studied computer science at the University of Karlsruhe. After working as researcher in the computer science departments of the universities of Karlsruhe and Dortmund he joined the Institute of Cognitive Science at the University of Osnabrück where he finished his Ph.D. in 2004. His main research areas are machine learning, data analysis, and autonomous robots. As head of the robot soccer team "Brainstormers Tribots" he won the world championships in robot soccer 2006 and 2007.

Agenda

| | | 8h00 | 9h00 | 10h00 | 11h00 | 12h00 | 13h00 | 14h00 | 15h00 | 16h00 | 17h00 | 18h00 | 19h00 | 20h00 | 21h00 | | | | | |
|---------------------|--------|-----------------|-----------------|--------------|--------------|--------------|-------------|--------------|------------------------|-------------------|-------------------|-------|-------|-------|-------|-------|-------|--------|--|--|
| 03.Dec Monday | Room 1 | Opening Session | Registration | | | Invited Talk | Lunch break | Registration | | | Closing Session | | | | | | | | | |
| | Room 2 | | SDIA 2007 | Coffee break | SDIA 2007 | | | SDIA 2007 | Coffee break | SDIA 2007 | | | | | | | | | | |
| 04.Dec Tuesday | Room 1 | Registration | Opening Session | Invited Talk | Coffee break | Lunch break | GAIW | GAIW | Coffee break | GAIW | Welcome Reception | | | | | | | | | |
| | Room 2 | | | | | | | | | | | | | | | TEMA | TEMA | TEMA | | |
| | Room 3 | | | | | | | | | | | | | | | CMBBS | CMBBS | AJASTS | | |
| 05.Dec Wednesday | Room 1 | Invited Talk | Coffee break | GAIW | Lunch break | GAIW | GAIW | Coffee break | GAIW | | | | | | | | | | | |
| | Room 2 | | | | | | | | | TEMA | BAOSW | | | | | | | | | |
| | Room 3 | | | | | | | | | ALEA | ALEA | ALEA | | | | | | | | |
| 06.Dec Thursday | Room 1 | Invited Talk | Coffee break | GAIW | Lunch break | MASTA | MASTA | Coffee break | APPIA General Assembly | Conference Dinner | | | | | | | | | | |
| | Room 2 | | | | | | | | | | | | | | | MASTA | BI | | | |
| | Room 3 | | | | | | | | | | | | | | | ALEA | | | | |
| 07.Dec Friday | Room 1 | Invited Talk | Coffee break | IROBOT | Lunch break | IROBOT | IROBOT | Coffee break | IROBOT | Closing Session | | | | | | | | | | |
| | Room 2 | | | | | | | | | | | | | | | AMITA | STCS | | | |
| | Room 3 | | | | | | | | | | | | | | | BI | BI | | | |
| | | 8h00 | 9h00 | 10h00 | 11h00 | 12h00 | 13h00 | 14h00 | 15h00 | 16h00 | 17h00 | 18h00 | 19h00 | 20h00 | 21h00 | | | | | |

Program

TUESDAY

8:00 Registration

9:00 Opening Session

9:30 Invited Talk

Chair: Manuel Santos

Evolving Rules to Solve Problems: The Learning Classifier Systems Way
Pier Luca Lanzi (Politecnico di Milano, Italy)

11:00 Coffee Break

11:30 Parallel sessions

Room 1: GAIW

Chair: José Neves

105 - Gödel and Computability
Luis Moniz Pereira

159 - Real-Time Intelligent Decision Support System for Bridges Structures
Behavior Prediction
Hélder Quintela, Manuel Santos, Paulo Cortez

144 - Modelling Morality with Prospective Logic
Luis Moniz Pereira, Ari Saptawijaya

Room 2: TEMA

Chair: Joaquim Silva

121 - A CBR Approach for e-Learning Content Categorization and Retrieval
Luis Rodrigues, Bruno Antunes, Paulo Gomes, Arnaldo Santos, Jacinto Barbeira,
Rafael Carvalho

161 - Clarification Dialogs: a tool for Question Answering disambiguation
Luis Quintano, Irene Rodrigues

77 - Semantic Tagging and Summarization for Searching People on the Web
Horacio Saggion

Room 3: CMBSB

Chair: Miguel Rocha

44 - System Stability via Stepping Optimal Control: Theory & Applications
Binhua Tang, Li He, Sushing Chen, Bairong Shen

108 - Feature Extraction from Tumor Gene Expression Profiles Using DCT and DFT
Shulin Wang, Huowang Chen, Shutao Li, Dingxing Zhang

93 - Visual Attention in Embodied RR-ANN without Learning
Jorge Simão, Raquel Abreu

13:00 Lunch

14:30 Parallel sessions

Room 1: GAIW

Chair: Manuel Santos

29 - Optimal Brain Surgeon for General Dynamic Neural Networks
Christian Endisch, Christoph Hackl, Dierk Schröder

208 - Two puzzles concerning measures of uncertainty and the positive Boolean connectives
Gregory Wheeler

179 - Compositional Semantics Grounded in Commonsense Metaphysics
Walid Saba

130- Rank Ensemble Features for Constructive Induction
Carlos Ferreira, João Gama

Room 2: TEMA

Chair: Gabriel Lopes

71 - Mining Classical Music Scores for Epoch Classification
Alberto Simões, Anália Lourenço, José Almeida

89 - Choosing a Hierarchical Cluster Labelling Method for a Specific Domain Document Collection
Maria Moura, Solange Rezende

51 - Text Segmentation Using Context Overlap
Radim Rehurek

115 - SCORES: Summarizer using Combination and Reduction of Extracted Sequences
Tenneti Tejaswi, Gautam Parai, Pranip Borah, Saurav Shah, Sudip Sanyal

Room 3: CMBSB

Chair: Paulo Azevedo

23 - Mining Protein Structure Data
José Santos, Pedro Barahona, Ludwig Krippahl

96- Evaluating Simulated Annealing Algorithms in the Optimization of Bacterial Strains
Miguel Rocha, Rui Mendes, Paulo Maia, José Pinto, Isabel Rocha, Eugénio Ferreira

90 - An Ontology-Based Approach To Systems Biology Literature Retrieval and Processing
Anália Lourenço, Alberto Simões, José Almeida, Miguel Rocha, Isabel Rocha, Eugénio Ferreira

145 -A low resolution model for protein structure prediction from NMR data
Olivier Perriquet, Marco Correia, Pedro Barahona, Ludwig Krippahl

16:30 Coffee break

17:00 Parallel sessions

Room 1: GAIW

Chair: Pedro Henriques

4 - Towards an Evolutionary Epistemology
Luis Moniz Pereira

134 - Exploring different strategies for the automatic generation of song lyrics with Tra-la-Lyrics
Hugo Gonçalo Oliveira, Amílcar Cardoso, Francisco Pereira

122 - Prospective Logic Agents
Luis Moniz Pereira, Gonçalo Lopes

169- Temporal Annotations for a Contextual Logic Programming Language
Vitor Nogueira, Salvador Abreu

Room 2: TEMA

Chair: Victor Rocio

94 - Language Identification in Documents, Including Unknown Languages: a Statistical Approach
Joaquim Silva, José Lopes, José Reis, João Mexia

160 - New Techniques for Relevant Word Ranking and Extraction
João Ventura, Joaquim Silva

14 - Combining Approaches for Classifying Metonymy of Named Locations
Sven Hartrumpf, Johannes Leveling

Room 3: AIASTS

Chair: Rosaldo Rossetti

47 - Agent Activity-Rescheduling Decisions Under Unexpected Events
Linda Nijland, Theo Arentze, Aloys Borgers, Harry Timmermans

152 - Nonlinear Models for Determining Mode Choice - Accuracy is not always the optimal goal
Elke Moons, Geert Wets, Marc Aerts

209 - Towards a specification of a framework for sustainable transportation analysis
Rosaldo Rossetti, Eugénio Oliveira, Ana Bazzan

217 - Learning versus Adaptation in Games with Many Co-Evolving Agents
Ana Bazzan, Franziska Klugl, Kai Nagel

19:30 Welcome reception (Paço dos Duques)

WEDNESDAY

8:30 invited talk

Chair: José Neves

Thinkers and Thoughts: Implications of Swarm Intelligence
James Kennedy (US Department of Labor, Washington, USA)

10:00 Coffee Break

10:30 Parallel sessions

Room 1: GAIW

Chair: Rui Mendes

101 -Relaxing Feature Selection in Spam Filtering by using Case-Based Reasoning Systems

José Méndez Reboredo, Florentino Fdez-Riverola, Daniel Glez-Peña, Fernando Díaz, Juan Corchado

163 - Semi-Fuzzy Splitting in Online Divisive-Agglomerative Clustering

Pedro Rodrigues, Joao Gama

95- Application of Logic Wrappers to Hierarchical Data Extraction from HTML

Amelia Badica, Costin Badica, Elvira Popescu

30 -Implementation of Suspension-Based Tabling in Prolog using External Primitives

Ricardo Rocha, Cláudio Caldas, Ricardo Lopes

150- Change Detection in Learning Histograms from Data Streams

Raquel Sebastião, João Gama

Room 2: TEMA

Chair: Victor Rocio, Joaquim Silva and José Gabriel Lopes

109 - N-grams and morphological normalization in text classification: a comparison on a Croatian-English parallel corpus

Artur Silic, Jean-Hugues Chauchat, Bojana Dalbelo Basic, Annie Morin

142 - Discovering Co-Relations on Research Topics and Authors from the PubMed Database

Pedro Ferreira, Giovani Librelotto, Ronnie Alves

75 - Automatic Extraction of Definitions in Portuguese: A Rule-Based Approach

Rosa del Gaudio, António Branco

42 - Neuro-Symbolic Word Tagging

Nuno Cavalheiro Marques, Sebastian Bader, Vitor Rocio, Steffen Hölldobler

116 - Detection of Strange and Wrong Automatic Part-of-Speech Tagging

Vitor Rocio, Joaquim Silva, José Lopes

Room 3: ALEA**Chair:** Luis Correia

151 - Improving Evolutionary Algorithms with Scouting
Konstantinos Bousmalis, Gillian Hayes, Jeffrey Pfaffmann

20 - A Genetic Programming Approach to the Generation of Hyper-Heuristics for the Uncapacitated Examination Timetabling Problem
Nelishia Pillay, Wolfgang Banzhaf

31- Evolving Finite Acceptors for Regular Languages
Amashini Naidoo, Nelishia Pillay

9 - Symmetry at the Genotypic Level and the Simple Inversion Operator
Cristian Munteanu, Agostinho Rosa

215- Exploiting Second Order Information in Computational Multi-Objective Evolutionary Optimization
Pradyumn Shukla

13:00 Lunch**14:30 Parallel sessions****Room 1: GAIW****Chair:** Victor Alves

123- An Iterative Process for Building Learning Curves and Predicting Relative Performance of Classifiers
Rui Leite, Pavel Brazdil

156 - Examining Syntactic Constructions for Verb Meaning Acquisition
Mário Machado, Aline Villavicencio

185 -The Halt Condition in Genetic Programming
José Neves, José Machado, Cesar Analide, António Abelha, Luís Brito

193 - The Emergence of Bipolar State Spaces in Embodied Neural Agents with Proprioception
Jorge Simão

126 - Cluster-based novelty detection with dynamic adaptation of the number of clusters
Eduardo Spinoso, André Carvalho, João Gama

Room 2 : BAOSW**Chair:** Sofia Pinto

141- Using Ontologies for Software Development Knowledge Reuse
Bruno Antunes, Nuno Seco, Paulo Gomes

97 - Partial and Dynamic Ontology Mapping Model in Dialogs of Agents

Ademir Freddo, Robison Brito, Gustavo Gimenez-Lugo, Cesar Tacla

146 - Topic Maps Constraint Languages: understanding and comparing
Giovani Librelotto, Renato Azevedo, José Ramalho, Pedro Henriques

199 - Community Knowledge Sharing: issues on the use of ontologies
Hugo Ferreira, António Soares

192 - Detailed Ontologies and Text Classification: A Promising Union
Eunice Palmeira, Fred Freitas

Room 3: ALEA

Chair: Helder Coelho

56- Using PBIL for Solving a Real-World Frequency Assignment Problem in GSM Networks

David Dominguez-González, Jose Chaves-González, Miguel Vega-Rodríguez, Juan Gómez-Pulido, Juan Sánchez-Pérez

202 - HeRoN: a computational model of gene regulatory networks
Ângela Gonçalves, Ernesto Costa

46- Asynchronous Stochastic Dynamics and the Spatial Prisoner's Dilemma Game
Carlos Grilo, Luis Correia

73 - Defining the Best Parameters in a Differential Evolution Algorithm for Location Area Problem in Mobile Networks

Sónia Almeida-Luz, Miguel Vega-Rodríguez, Juan Gómez-Pulido, Juan Sánchez-Pérez

196 - Stochastic Barycenters and Beta Distribution for Gaussian Particle Swarms
Rui Mendes, James Kennedy

17:00 Coffee break

17:30 Parallel sessions

Room 1: GAIW

Chair: Luís Antunes

188- Composition and Decomposition of Ontologies
Dora Simões, Hugo Ferreira, António Soares

182 - Combinations of Domain Enhancing Macro-Actions in Planning
Muhammad Newton, John Levine

176 - On the Use of Rough Sets for User Authentication via Keystroke Dynamics
Kenneth Revett, Sérgio de Magalhães, Henrique Santos

Room 3: ALEA

Chair: Ernesto Costa

103 - Towards Representation of Rhythm in Genetic Algorithm
Martin Dostal

92 - Neural Network Classifier Design Using the Evolutionary ANNE Algorithm
Marco Castellani, Nuno Cavalheiro Marques

82- Evolutionary Search for Cellular Automata in the Parity Problem: Variations in
Rule Evaluation Methods
Paulo Sérgio Silva, Pedro Paulo de Oliveira

THURSDAY

8:30 invited talk

Chair: José Machado

Traffic Simulation and Control: challenges and opportunities for agent technology, multiagent systems, and artificial intelligence

Ana Bazzan (Federal University of Rio Grande do Sul, Brazil)

10:00 Coffee Break

10:30 Parallel sessions

Room 1: GAIW

Chair: José Machado

80 -Temporal Pattern Mining Using a Time Ontology

Cláudia Antunes

173- A Spatio-Temporal Trajectory Analysis and Retrieval Framework

Zia Ul Qayyum, A.G. Cohn

149- A Computer System to Control Affective Content in Music Production

António Oliveira, Amílcar Cardoso

84 - Answer-Set Programming based Dynamic User Modeling for Recommender Systems

João Leite, Manoela Ilic

24 -Towards Tractable Local Closed World Reasoning for the Semantic Web

Matthias Knorr, Jose Alferes, Pascal Hitzler

Room 2: MASTA

Chair: Paulo Novais

211 - Multi-Level, Functional, Spatial and Temporal Agent's Reasoning Debugging

Nuno Lau, Luis Reis, João Certo

28 - Implementing an Agent Following MicroCredit Practices for a Competitive Supply Chain Management Environment

Pedro Abreu, Pedro Mendes, Daniel Silva, Vasco Vinhas

50 - Multi-agent Learning: How to Interact to Improve Collective Results

Pedro Rafael, João Neto

52 - A Basis for an Exchange Value-based Operational Notion of Morality for Multiagent Systems

Antonio Costa, Graçaliz Dimuro

10 - Decision Making with Hybrid Models: the Case of Collective and Individual Motivations

Paulo Trigo, Helder Coelho

Room 3: ALEA

Chair: Agostinho Rosa

117 - Omni-directional RND Optimisation using Differential Evolution: In-depth Analysis via High Throughput Computing

Silvio Mendes, Patrício Domingues, David Pereira, Renato Vale, Juan Gómez-Pulido, Luis Silva, Miguel Vega-Rodríguez, Juan Sánchez-Pérez

162 - An Evolutionary Algorithm for Skyline-Join Query Optimization

Fabiola Di Bartolo, Marlene Gonçalves, Ivette Martinez, Francelice Sardá

223 - Agent Based Modelling and Simulation of the Immune System: a Review

Nuno Fachada, Vitor Lopes, Agostinho Rosa

13:00 Lunch**14:30 Parallel sessions****Room 2: MASTA**

Chair: Eugénio Oliveira

191 - Tax Compliance through MABS: the Case of Indirect Taxes

Luís Antunes, João Balsa, Helder Coelho

35 - Convergence of independent adaptive learners

Francisco Melo, Manuel Lopes

127 - A Probabilistic Agent to support Collaboration in a Medical Learning Environment

Elisa Boff, Rosa Vicari, Cecília Flores, Eliseo Reategui

119 - e-Citizen interacting with virtual government institutions

Jose Luiz Nogueira, Luis Correia, Ana Cristina Garcia

187 - Intelligent Farmer Agent for Multi-Agent Ecological Simulations Optimization

Filipe Cruz, António Pereira, Pedro Valente, Pedro Duarte, Luís Reis

Room 3: BI

Chair: Alípio Jorge

140 - SAID: A Business Intelligent Tool based on Open Source

Pedro Lopes, João Santos, Paulo Gomes, Marco Vieira, Luis Cortesão

216 - Resource-bounded Fraud Detection

Luis Torgo

128 - A Study of Imbalanced Datasets with Class Overlap

Emerson Machado, Marcelo Ladeira

201 - A Data Mining Approach to Predict Forest Fires using Meteorological Data

Paulo Cortez, Anibal Morais

183 - A Data Warehouse for Web Intelligence

Marcos Domingues, Alípio Jorge, Carlos Soares, José Paulo Leal, Pedro Machado

17:00 Coffee break

17:30 APPIA meeting

20:30 Conference dinner (Hotel de Guimarães)

FRIDAY

8:30 invited talk

Chair: Luis Correia

Neural Reinforcement Learning for Real Robot Applications
Martin Lauer (University of Osnabrück, Germany)

10:00 Coffee Break

10:30 Parallel sessions

Room 1: IROBOT

Chair: Cesar Analide

63 - Generalization and Transfer Learning in Noise-Affected Robot Navigation Tasks
Lutz Frommberger

16 - An Omnidirectional Vision System for Soccer Robots
António J. R. Neves, Gustavo Corrente, Armando Pinho

64 - Path Planning and Motion Coordination for Compact Vehicle-Formations
Martin Saska, Martin Hess, Klaus Schilling

171 - Human Robot Interaction based on Bayesian Analysis of Human Movements
Joerg Rett, Jorge Dias

198 - Understanding Dynamic Agents Reasoning
Nuno Lau, Luis Reis, João Certo

Room 2: AMITA

Chair: António Abelha

136 - Ambient Intelligence in Group Decision Making: A Look to the Future
Ricardo Santos, Goreti Marreiros, Carlos Ramos, José Neves, José Bulas-Cruz

99 - Ambient Intelligence – a State of the Art from Artificial Intelligence perspective
Carlos Ramos

107 - Ubiquitous Ambient Intelligence in a Flight Decision Assistance System
Nuno Gomes, Carlos Ramos, Cristiano Pereira, Francisco Nunes

166 - Argumentation-based Decision Making in Ambient Intelligence Environments
Goreti Marreiros, Ricardo Santos, Paulo Novais, José Machado, Carlos Ramos, José Neves, José Bulas-Cruz

174 - Hardware and Software in Smart Decision Rooms
Carlos Freitas, Goreti Marreiros, Ricardo Santos, Carlos Ramos

Room 3: BI

Chair: Carlos Soares

7- A Comparative Study of Corporate Credit Rating Prediction Models
Tianyi Jiang, Yun Ye, Shufen Liu

65- Experiments for the number of clusters in K-Means
Mark Ming-Tso Chiang, Boris Mirkin

129 - A Network Algorithm to Discover Sequential Patterns
Luis Cavique

68 - A data mining approach for territorial watch
Sylvie Chalaye, Christine Largeron

137 - Decisional System Modelling: A Methodological Framework To Help in
Decisional System designing
Ophélie Gomes, Catherine Combes, Alain Dussauchoy

13:00 Lunch

14:30 Parallel sessions

Room 1: IROBOT

Chair: Nuno Lau

61 - Building a Robotic Eye and Eyelid for Human-Robot Interaction
Javier Mateo, Fidel Aznar, Mireia Sempere, Mar Pujol, Ramón Rizo

76 - A framework to remote operate real robots
Luis Moniz, Paulo Urbano

170 - Efficient Robotics using the Lego NXT Platform and .NET
Rui Guedes, Luis Reis, Armando Sousa

168 - Towards long-term visual learning of object categories in human-robot
interaction
Luis Seabra Lopes, Aneesh Chauhan, João Silva

195 - Simulation Meets Reality: A Cooperative Approach to RoboCup's Physical
Visualization Soccer League
Ricardo Gimenes, Luis Mota, Nuno Lau, João Certo, Luis Reis

Room 2: AMITA

Chair: Carlos Ramos

133 - Context Awareness using Scalable Intelligence in the Dynamic Scheduling of
Manufacturing Tasks
José Avelino Marinho, Carlos Ramos, José Paulo Oliveira

184 - Intelligent Mixed Reality for the creation of Ambient Assisted Living
Ricardo Costa, José Neves, Paulo Novais, José Machado, Luís Lima, Carlos Alberto

205 - Medical Imaging Environment – A Multi-Agent System for a Computer
Clustering based Multi-Display
Victor Alves, Filipe Marreiros, Luís Nelas, Mourylise Heymer, José Neves

88 - Proactive Scheduling for Situated Displays
Fernando Ribeiro, Rui José

Room 3: BI

Chair: Paulo Cortez

81- Detecting Telecommunications Fraud based on Signature Clustering Analysis
Pedro Ferreira, Ronnie Alves, Orlando Belo, Joel Ribeiro

177 - A tool for interactive Subgroup Discovery using Distribution Rules
Joel Lucas, Alípio Jorge, Fernando Pereira, Ana Pernas, Amauri Machado

164 - Mining first-order frequent patterns in e-commerce data
Martin Večeřa, Luboš Popelínský, Jan Blažák

48 - A Metamorphosis Algorithm for the Optimization of a Multi-Node OLAP System
Jorge Loureiro, Orlando Belo

194 - A Hybrid Parallel SOM Algorithm for Large Maps in Data-Mining
Bruno Silva, Nuno Cavalheiro Marques

17:00 Coffee break

17:30 Parallel sessions

Room 1: IROBOT

Chair: Luís Paulo Reis

125 - Heuristic Q-Learning Soccer Players: a new Reinforcement Learning approach to RoboCup Simulation
Luiz Celiberto Jr, Jackson Matsuura, Reinaldo Bianchi

165 - Low-Cost System for Object Positioning Through Laser-Camera Triangulation
Ana Rufino Ferreira, António Moreira, Paulo Costa

214- Self-configuration of an Adaptive TDMA wireless communication protocol for teams of mobile robots
Frederico Santos, Gustavo Currente, Luis Almeida, Nuno Lau, Luis Seabra Lopes

Room 2: STCS

Chair: Inês Lynce

59 - A Generalized Two-watched-literal Scheme in a mixed Boolean and Non-linear Arithmetic Constraint Solver
Tino Teige, Christian Herde, Martin Fränzle, Natalia Kalinnik, Andreas Eggers

83 - Pruning by Dominance: A Case Study of Best-First Search applied to the Job Shop Scheduling with Makespan Minimization
María Sierra, Ramiro Varela

207 - GRASPER: A framework for graph constraint satisfaction problems
Ruben Viegas, Francisco Azevedo

197 - Efficient and Tight Upper Bounds for Haplotype Inference by Pure Parsimony using Delayed Haplotype Selection
João Marques-Silva, Inês Lynce, Ana Graça, Arlindo Oliveira

189 - Mapping characteristics of instances to Evolutionary Algorithm operators: an empirical study on the basic Job-shop scheduling problem
Pedro Abreu, Carlos Soares

Room 3: BI

Chair: Orlando Belo

37 - Analysis of the day-of-the-week anomaly for the case of emerging stock market
Virgilijus Sakalauskas, Dalia Kriksciuniene

186 - Quantitative Evaluation of Clusterings for Marketing Applications: a Web Portal Case Study
Carmen Rebelo, Pedro Quelhas Brito, Carlos Soares, Alípio Jorge, Rui Brandão

154 - Adaptive Decision Support for Intensive Care
Pedro Gago, Álvaro Silva, Manuel Santos

20:00 Closing session