PROPOSAL FOR A SPECIAL SESSION at IWANN 2015

1. TITLE OF THE PROPOSED SESSION

Computing Languages with Bio-Inspired Devices and Multi-Agent Systems

2. ORGANIZERS, CONTACT INFORMATION AND AFFILIATIONS.

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3. MOTIVATION AND OBJECTIVES FOR THE SESSION

Natural Computing (NC) is an emerging field in formal language theory, which is mainly focused on the computing capabilities of formal devices that abstract some natural complex phenomena. These bio-inspired models include both, classic computing devices (such as cellular automata, Lindenmayer systems, DNA computing, evolutionary computation, Multi-agent systems or artificial neural networks) and the latest and most innovative models of computation such as Membrane Computing or Networks of Evolutionary Processors.

Regarding Multi-Agent Systems (MAS), the concept of agent can be found in a range of disciplines as, for example, computer networks, software engineering, artificial intelligence, human-computer interaction, distributed and concurrent systems, mobile systems, telematics, information retrieval, etc.

NC and hence MAS offer strong models for representing complex and dynamic real-world environment. We are convinced that a field where those technologies can offer good solutions and alternative frameworks to classic models is the area of processing natural and formal languages. This is why we propose a

special session on language(s) applications of MAS and bio-inspired computing devices.

The aim of this special session is to bring together researchers from different areas that have in common the use of multi-agent and bio-inspired systems to approach different aspects of natural/formal language. We aim to bring together researchers that are developing models for dealing with languages in both, theoretical and applied lines of research.

We are interested in bio-inspired models themselves (different from artificial neural networks), that is, in (but not only) their:

1. Simulation
2. Analysis
3. Programming/developing tools

and in their application to (but not only):

1. Theoretical descriptions of languages based on multi-agent systems
2. Natural language generation and recognition
3. Dialogue modelling
4. Speech recognition
5. Semantics and ontologies
6. Parsing technologies
7. Simulation of natural language evolution
8. Bio-Inspired and computational models in language learning

In general, contributions on any interaction between multi-agent and bio-inspired computing systems and natural/ formal languages are welcome.

We think that our proposal can be very relevant to the main conference, since it concentrates in a very promising topic in the field of bio-inspired and multi-agent systems: *applications to natural/formal language description and analysis*. One of the important values of the session is its multi-disciplinary character. The main objective of this session is to boost the interchange of knowledge and viewpoints between specialists that working on linguistics, biology or computation have interest in using methods from other disciplines that can provide new ideas, new tools and new formalisms to approach their problems and that can help in the improvement of their theories and models. Therefore, the main goal is to promote interdisciplinarity among linguistics, biology and computation. The area of convergence between those three disciplines is given rise to the emergence of new scientific paradigms that will have an epistemological, social and cultural impact. Therefore, we think that IWANN2015 can clearly benefit from the inclusion of a special session of this type attracting a new/different kind of participants/researchers.

The special session could be of interest both to people dealing with language(s) issues and to researchers working in the field of multi-agents systems and in natural computing. Linguists and formal language theorists will find in this special session new models and ideas based on MAS and bio-inspired devices,

which can help in approaching and solving classical problems in the field of natural/formal language studies. People from the field of agent technologies and natural computing will find in this session interesting and novel applications of the models they work with and will compare and share their models and experiences. Researchers in the fields of artificial intelligence and human-computer interaction can also be interested on the technical issues that will be addressed in this special session.

4. SHORT BIOGRAPHY OF THE ORGANIZERS

BIO-DATA M. Dolores Jiménez-López

M. Dolores Jiménez López is an associate professor (*profesor agregado*) at the Departament de Filologies Romàniques in the Universitat Rovira i Virgili (Tarragona, Spain). She worked two years, as a pre-doctoral fellow, at the Computer and Automation Research Institute of the Hungarian Academy of Sciences in Budapest. Her post-doctoral training includes a three-year stay at the Department of Computer Science in the University of Pisa as a Marie Curie Researcher. She has participated in several research projects and has been the research in charge of three contracts with the European Commission. She has published about hundred articles in journals and monographic volumes, she has edited four volumes on the interplay between linguistics and computation, and she has participated in many international conferences and has organized conferences, workshops and special sessions. Application of formal models to natural language analysis is one of her main research topics.

BIO-DATA Alfonso Ortega de la Puente

Alfonso Ortega received the Doctorate degree in computer science from the Universidad Autónoma de Madrid (Spain). He is currently a Professor at the Universidad Autónoma de Madrid. He formerly lectured at the Universidad Pontificia de Salamanca and worked at LAB2000 (an IBM subsidiary) as a Software Developer. He has published about twenty technical papers on computer languages, complex systems, graphics, and theoretical computer science, and has collaborated in the development of several software products.

5. LIST OF PROSPECTIVE CONTRIBUTED PAPERS

BATISTA-GALVÁN, MARÍA; BECERRA-BONACHE, LEONOR AND JACQUENET, FRANÇOIS: "Contextual Grammatical Inference"

Laboratorire Hubert Curien
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BECERRA-BONACHE, LEONOR; DAHL, VERONICA: "Probabilistic Grammatical Inference"

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COMBES, CATHERINE: "Contribution of Grammatical Inference, Optimization and Simulation to Manage Nursing Homes"

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GÓMEZ CANAVAL, SANDRA: "Parametrized Polarized NEPs: o meta-biological extension to NEPs"

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JIMÉNEZ, ANTONIO; ORTEGA, ALFONSO, JIMÉNEZ, KARINA PAOLA: "Distributed simulation of natural computers by means of internet applied to NEPs"

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