

# IWINAC2005

## INTERNATIONAL WORK-CONFERENCE ON THE INTERPLAY BETWEEN NATURAL AND ARTIFICIAL COMPUTATION

### **FINAL PROGRAM**

Las Palmas de Gran Canaria, Spain.

June 15–18, 2005.

Organized by

Univ. Nacional de Educación a Distancia (UNED).

in cooperation with

Univ. de Las Palmas de Gran Canaria

and Las Palmas UNED Associated Center

Contact URL <http://www.iwinac.uned.es/iwinac2005/>

## Scope

Welcome to IWINAC2005, the International Work-conference on the Interplay between Natural and Artificial Computation.

The computational paradigm is considered here as a conceptual, theoretical and formal framework situated above machines and living creatures (two instantiations), sufficiently solid, and still non-exclusive, to allow us:

1. To help Neuroscientists to formulate intentions, questions, experiments, methods and explanation mechanisms assuming that neural circuits are the psychological support of calculus.
2. To help Scientists and Engineers from the fields of Artificial Intelligence (AI) and Knowledge Engineering (KE) to model, formalize and program the computable part of human knowledge.
3. To establish an interaction framework between Natural System Computation (NSC) and Artificial System Computation (ASC) in both directions, from ASC to NSC (in Computational Neuroscience), and from NSC to ASC (in Bioinspired Computation).

Under these global purpose, we have organized IWINAC2005, the first “International Work-conference on the Interplay between Natural and Artificial Computation” that took place in Las Palmas de Gran Canaria, Canary Islands (Spain), during June 15-18, 2005, trying to contribute to both directions of the interplay:

- I:** From Artificial to Natural Computation. What can Computation, Artificial Intelligence (AI) and Knowledge Engineering (KE) contribute to the understanding of Nervous System, Cognitive Processes and Social Behavior?. This is the scope of Computational Neuroscience and Cognition, which uses the computational paradigm to model and improve our understanding of natural science.
- II:** From Sciences of Natural to Computation, AI&KE. How can computation, AI and KE find inspiration in the behavior and internal functioning of physical, biological and social systems to conceive, develop and build-up new concepts, materials, mechanisms and algorithms of potential value in real world applications? This is the scope of the new Bionics, known as Bioinspired Engineering and Computation, as well as of Natural Computing.

## Acknowledgements

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- Obra Social de La Caja de Canarias.
- Las Palmas de Gran Canaria Convention Bureau.
- Instituto Universitario de Ciencias y Tecnologías Cibernéticas in ULPGC, *Roberto Moreno-Díaz* and his staff.
- The local staff from the Las Palmas de Gran Canaria Associated Centre of UNED.
- Gobierno de Canarias y Cabildo de Gran Canaria.

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-

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## Invited Speakers

**Joost N. Kok**, Leiden University (The Netherlands)  
**Dana Ballard**, University of Rochester (USA)  
**Juan Vicente Sánchez Andrés**, University of La Laguna (Spain)

## Field Editors

**Eris Chinellato**, Universitat Jaume-I (Spain)  
**Carlos Cotta**, University of Málaga (Spain)  
**Angel P. del Pobil**, Universitat Jaume-I (Spain)  
**Antonio Fernández-Caballero**, Universidad de Castilla-La Mancha (Spain)  
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**Victor Mitrana**, Rovira i Virgili University of Tarragona (Spain)  
**José T. Palma Méndez**, University of Murcia (Spain)  
**Miguel Angel Patricio Guisado**, Universidad de Alcalá (Spain)  
**Eduardo Sánchez Vila**, Universidad de Santiago de Compostela (Spain)  
**Ramiro Varela Arias**, Universidad de Oviedo (Spain)

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**Marley Vellasco**, Pontifical Catholic University of Rio de Janeiro (Brazil)  
**Barbara Webb**, University of Edinburgh (United Kingdom)  
**Stefan Wermter**, University of Sunderland (United Kingdom)  
**Tom Ziemke**, Universyti of Skövde (Sweden)

## PROGRAM SCHEDULE

<b>Tuesday June 14</b>	
16:30–19:30	<i>Registration at Technical Secretariat desk</i>

<b>Wednesday June 15</b>			
	Room A	Room B	Room C
08:45–09:20	Conference Opening		
09:20–10:20	Plenary Session I: Prof. Joost N. Kok		
10:20–11:40	Computational Neuroscience I	Collective Behaviour	Bioinspired Applications I
	<i>Coffee break</i>		
12:00–13:40	Computational Neuroscience II	Evolutionary Computation I	Bioinspired Applications II
14:00–	<i>Lunch in restaurant “La Marinera”</i>		
16:30–18:00	Computational Neuroscience III	Evolutionary Computation II	Bioinspired Applications III
20:00–	<i>Welcome Reception and Folklore in “Club Náutico”</i>		

<b>Thursday June 16</b>			
	Room A	Room B	Room C
09:00–10:00	Plenary Session II: Prof. Juan Vicente Sánchez-Andrés		
10:00–11:20	Computational Neuroscience IV	Evolutionary Computation III	Bioinspired Applications IV
	<i>Coffee break</i>		
11:40–13:40	Knowledge Modelling	Evolutionary Computation IV	Bioinspired Applications V
14:00–	<i>Lunch in restaurant “La Marinera”</i>		
16:30–18:00	Posters session		
20:00–	<i>Official conference dinner in restaurant “La Marinera”</i>		

<b>Friday June 17</b>			
	Room A	Room B	Room C
09:00–10:00	Plenary Session III: Prof. Dana Ballard		
10:00–11:20	Neural Models and Experm. Data I	Evolutionary Computation V	Bioinspired Applications VI
	<i>Coffee break</i>		
11:40–13:40	Neural Models and Experm. Data II	Hybrid Computation	Bioinspired Applications VII
14:00–	<i>Lunch in restaurant “La Marinera”</i>		

- Session: Plenary I June, 15. 09:20–10:20 Room: A  
 “**Towards Evolutionary DNA computing**” (I-244)  
*Christiaan V. Henkel, Joost N. Kok*
- Session: **Computational Neuroscience I** June, 15. 10:20–11:40 Room: A  
 Chair: José Mira  
 Co-Chair: Jan Treur
  - “On the use of the Computational Paradigm in Neurophysiology and Cognitive Science” (I-1)  
*José Mira*
  - “Modules, Layers, Hierarchies, and Loops where Artificial Intelligence Meets Ethology and Neuroscience - in context of action selection” (I-16)  
*Pinar Öztürk*
  - “A Unified Perspective on Explaining Dynamics by Anticipatory State Properties” (I-26)  
*Jan Treur*
  - “Conceptual Idea of Natural Mechanisms of Recognition, Purposeful Thinking and Potential of its Technical Application” (I-48)  
*Zinoviy Rabinovich, Yuriy Belov*
- Session: **Collective Behaviour** June, 15. 10:20–11:40 Room: B  
 Chair: Joost N. Kok  
 Co-Chair: Xin-She Yang
  - “Using Bees to solve a Data-Mining problem expressed as a Max-Sat one” (II-209)  
*Karima Benatchba, Lotfi Admane, Mouloud Koudil*
  - “Engineering Optimizations via Nature-Inspired Virtual Bee Algorithms” (II-314)  
*Xin-She Yang*
  - “Solving partitioning problem in codesign with ant colonies” (II-321)  
*Mouloud Koudil, Karima Benatchba, Said Gharout, Nacer Hamani*
  - “Self assembling graphs” (I-501)  
*Vincent Danos, Fabien Tarissan*
- Session: Bioinspired Applications I June, 15. 10:20–11:40 Room: C  
 “**Natural and Artificial Aspects of Visual Attention**”  
 Organizer & Chair: Heinz Hügli  
 Co-Chair: Antonio Fernández-Caballero
  - “Sensitivity from Short-Term Memory vs. Stability from Long-Term Memory in Visual Attention Method” (II-446)  
*Maria Teresa López Bonal, Antonio Fernández-Caballero, Miguel A. Fernández, Ana E. Delgado García*
  - “Visual Attention, Visual Saliency, and Eye Movements During the Inspection of Natural Scenes” (II-456)  
*Geoffrey Underwood, Tom Foulsham, Editha van Loon, Jean Underwood*
  - “Model performance for visual attention in real 3D color scenes” (II-466)  
*Heinz Hügli, Tim Jost, Nabil Ouerhani*
  - “On the Evolution of Formal Models and Artificial Neural Architectures for Visual Motion Detection” (II-476)  
*Roberto Moreno-Díaz jr., Alexis Quesada Arencibia, Jose Carlos Rodríguez Rodríguez*
- Session: **Computational Neuroscience II** June, 15. 12:00–13:40 Room: A  
 Chair: Luigi M. Ricciardi  
 Co-Chair: Mario J. Pérez Jiménez
  - “A linear solution of Subset Sum Problem by using Membrane Creation” (I-261)  
*Miguel Angel Gutiérrez-Naranjo, Mario J. Pérez Jiménez, Francisco José Romero-Campero*
  - “A Study of the Robustness of the EGFR Signalling Cascade using Continuous Membrane Systems” (I-271)  
*Mario J. Pérez Jiménez, Francisco José Romero-Campero*
  - “Gaussian processes and neuronal modeling” (I-178)  
*Elvira Di Nardo, Amelia G. Nobile, Enrica Pirozzi, Luigi M. Ricciardi*

- “On the moments of firing numbers in diffusion neuronal models with refractoriness” (I-188)  
*Virginia Giorno, Amelia G. Nobile, Luigi M. Ricciardi*
- “Modelling of Dysfunctions in the Neuronal Control of the Lower Urinary Tract” (I-205)  
*Daniel Ruiz Fernández, Juan Manuel García Chamizo, Francisco Maciá Pérez, Antonio Soriano Payá*
- Session: **Evolutionary Computation I** June, 15. 12:00–13:40 Room: B  
 Chair: Marley Vellasco  
 Co-Chair: Daniel Manrique
  - “Cultural Operators for a Quantum-Inspired Evolutionary Algorithm Applied to Numerical Optimization Problems” (II-1)  
*André V. Abs da Cruz, Marco Aurélio C. Pacheco, Marley Vellasco, Carlos Roberto Hall Barbosa*
  - “Attribute Grammar Evolution” (II-179)  
*Marina de-la-Cruz-Echeandía, Alfonso Ortega-de-la-Puente, Manuel Alfonseca*
  - “The Allele Meta-Model - Developing a Common Language for Genetic Algorithms” (II-199)  
*Stefan Wagner, Michael Affenzeller*
  - “Nonlinear Robust Identification using Multiobjective Evolutionary Algorithms” (II-229)  
*Juan M. Herrero Durá, Xavier Blasco, Miguel Martínez Irazo, César Ramos*
  - “Grammar based crossover operator in genetic programming” (II-249)  
*Daniel Manrique, Fernando Marquez, Juan Rios, Alfonso Rodriguez-Paton*
- Session: Bioinspired Applications II June, 15. 12:00–13:40 Room: C  
**“Image Understanding”**  
 Organizer & Chair: Miguel Angel Patricio Guisado  
 Co-Chair: José Manuel Molina López
  - “Estimation of Fuel Moisture Content Using Neural Networks” (II-486)  
*David Riaño, Susan L. Ustin, Luis Usero, Miguel Angel Patricio Guisado*
  - “Adjustment of Surveillance Video Systems by a Performance Evaluation Function” (II-496)  
*Óscar Pérez Concha, Jesús García Herrero, Antonio Berlanga de Jesús, José Manuel Molina López*
  - “Application of Machine Learning Techniques for simplifying the Association Problem in a Video Surveillance System” (II-506)  
*Blanca Rodríguez Pajares, Óscar Pérez Concha, Jesús García Herrero, José Manuel Molina López*
  - “A Neurocalibration Model for Autonomous Vehicle Navigation” (II-516)  
*Miguel Angel Patricio Guisado, Dario Maravall, Julio Rejon, Angel Arroyo*
  - “Some remarks on the application of artificial neural networks to optical character recognition” (II-526)  
*Antonio Moratilla Ocaña, Ignacio Olmeda Martos*
- Session: **Computational Neuroscience III** June, 15. 16:30–18:30 Room: A  
 Chair: Roberto Moreno-Díaz  
 Co-Chair: Jose Manuel Ferrández
  - “A Novel Intrinsic Wave Phenomenon in Low Excitable Biological Media” (I-37)  
*Roustem Miftahof*
  - “Simulation of Orientation Contrast Sensitive Cell Behavior in TiViPE” (I-58)  
*Tino Lourens, Emilia I. Barakova*
  - “Formulation and Validation of a Method for Classifying Neurons from Multielectrode Recordings” (I-68)  
*María Paula Bonomini, Jose Manuel Ferrández, José Angel Bolea, Eduardo Fernández*
  - “Gap-junctions promote synchrony in a network of inhibitory interneurons in the presence of heterogeneities and noise” (I-77)  
*Santi Chillemi, Alessandro Panarese, Michele Barbi, Angelo Di Garbo*
  - “A conceptual model of amphibian’s tectum opticum with probabilistic coded outputs” (I-87)  
*Arminda Moreno Díaz, Gabriel de Blasio, Roberto Moreno-Díaz*
  - “A scientific point of view on perceptions” (I-419)  
*Juan Carlos Herrero*

- Session: Evolutionary Computation II June, 15. 16:30–18:30 Room: B  
**“Computing with Networks of Evolutionary Processors”**  
 Organizer & Chair: Victor Mitrana  
 Co-Chair: Carlos Martin-Vide
  - “Timed Accepting Hybrid Networks of Evolutionary Processors” (II-119)  
*Florin Silviu Manea*
  - “2D and 3D Pictural Networks of Evolutionary Processors” (II-89)  
*K. S. Dersanambika, K. G. Subramanian, Anthonath Roslin Sagaya Mary*
  - “Analysing Sentences with Networks of Evolutionary Processors” (II-99)  
*Gemma Bel Enguix, María Dolores Jiménez López*
  - “Simulating Evolutionary Algorithms with Eco-grammar Systems” (II-109)  
*Adrian Horia Dediu, Maria Adela Grandó*
  - “Networks of Evolutionary Processors with Splicing Rules” (I-293)  
*Ashish Choudhary, Kamala Krithivasan*
  - “Networks of Evolutionary Processors with Splicing Rules and Forbidding Context” (I-303)  
*Ashish Choudhary, Kamala Krithivasan*

- Session: **Bioinspired Applications III** June, 15. 16:30–18:30 Room: C  
 Chair: Javier de Lope  
 Co-Chair: Ginés Doménech Asensi
  - “Reconfigurable Hardware Implementation of Neural Networks for Humanoid Locomotion” (II-392)  
*Beatriz Prieto, Javier de Lope, Dario Maravall*
  - “A Tool for Implementing and Exploring SBM Models: Universal 1D Invertible Cellular Automata” (I-282)  
*Joaquín Cerdá Boluda, Rafael Gadea Gironés, Jorge Daniel Martínez Pérez, Ángel Sebastián Cortés*
  - “A Neuromimetic Integrated Circuit for Interactive Real-Time Simulation” (II-335)  
*Sylvain Saïghi, Jean Tomas, Yannick Bornat, Sylvie Renaud*
  - “A FPGA Architecture of Blind Source Separation and Real Time Implementation” (II-344)  
*Yong Kim, Hong Jeong*
  - “Description and simulation of bio-inspired systems using VHDL-AMS” (II-354)  
*Ginés Doménech Asensi, José A. López-Alcantud, Ramón Ruiz Merino*
  - “An Electronic Reconfigurable Neural Architecture for Intrusion Detection” (II-373)  
*Francisco Ibarra Pico, Angel Grediaga Olivo, Sergio García Crespi, Sergio Cuenca Asensi*



- Session: Plenary II June, 16. 09:00–10:00 Room: A  
**“The Neurophysiology underlying Intelligence and Human Knowledge”**  
*Juan Vicente Sánchez-Andrés* -
- Session: Computational Neuroscience IV June, 16. 10:00–11:20 Room: A  
**“Information Coding Mechanisms in the Brain”**  
Organizer & Chair: Eduardo Sánchez Vila  
Co-Chair: Luis M. Martínez Otero
  - “Coding strategies in early stages of the somatosensory system” (I-215)  
*Juan Navarro, Eduardo Sánchez Vila, Antonio Canedo*
  - “Auditory Nerve Encoding of High-Frequency Spectral Information” (I-225)  
*Ana Alves-Pinto, Enrique A. Lopez-Poveda, Alan R. Palmer*
  - “Multielectrode analysis of information flow through cat primary visual cortex” (I-235)  
*Luis M. Martínez Otero, Jose-Manuel Alonso*
  - “Evaluation of neuronal firing densities via simulation of a jump-diffusion process” (I-168)  
*Antonio Di Crescenzo, Elvira Di Nardo, Luigi M. Ricciardi*
- Session: Evolutionary Computation III June, 16. 10:00–11:20 Room: B  
**“Evolutive Computation for Combinatorial Optimization”**  
Organizer & Chair: Carlos Cotta  
Co-Chair: Günther R. Raidl
  - “New Codification Schemas for Scheduling with Genetic Algorithms” (II-11)  
*Ramiro Varela Arias, David Serrano Riestra, María Sierra Sánchez*
  - “Solving the Multidimensional Knapsack Problem Using an Evolutionary Algorithm Hybridized with Branch and Bound” (II-21)  
*José Gallardo, Carlos Cotta, Antonio Fernández*
  - “Cryptanalysis of Substitution Ciphers Using Scatter Search” (II-31)  
*Mohamed Amine Garici, Habiba Drias*
  - “Combining Metaheuristics and Exact Algorithms in Combinatorial Optimization: A Survey and Classification” (II-41)  
*Jakob Puchinger, Günther R. Raidl*
- Session: **Bioinspired Applications IV** June, 16. 10:00–11:20 Room: C  
Chair: José Ramón Álvarez Sánchez  
Co-Chair: Michela Ponticorvo
  - “A robotics inspired method for modeling accesible open space to help blind people in the orientation and traveling tasks” (I-408)  
*José Ramón Álvarez Sánchez, Félix de la Paz López, José Mira*
  - “Eye Tracking in Coloured Image Scenes represented by Ambisonic Fields of Musical Instrument Sounds” (I-330)  
*Guido Bologna, Michel Vinckenbosch*
  - “Action-based Cognition: How Robots with No Sensory System Orient Themselves in an Open Field Box” (I-398)  
*Michela Ponticorvo, Orazio Miglino*
  - “Landscaping Model for Virtual Environment” (II-432)  
*Madjid Fathi, Ursula Wellen*
- Session: Knowledge Modelling June, 16. 11:40–13:40 Room: A  
**“Advances on Intelligent Methods and Applications for Health-related Processes”**  
Organizer & Chair: Roque Marín  
Co-Chair: José T. Palma Méndez
  - “Aligning reference terminologies and knowledge bases in the health care domain” (I-440)  
*M<sup>a</sup>.Jesus Taboada, Julio Des, Diego Martínez, José Mira*
  - “Predicting mortality in the intensive care using episodes” (I-450)  
*Tudor Toma, Ameen Abu-Hanna, Robert-Jan Bosman*
  - “A Fuzzy Temporal Diagnosis Algorithm and a Hypothesis Discrimination Proposal” (I-462)  
*José T. Palma Méndez, Jose M. Juarez, Manuel Campos, Roque Marín*

- “Reasoning by Assumption: Formalisation and Analysis of Human Reasoning Traces” (I-430)  
*Tibor Bosse, Catholijn M. Jonker, Jan Treur*
  - “Key aspects of the Diagen conceptual model for medical diagnosis” (I-484)  
*Rafael Martínez Tomás, José Ramón Álvarez Sánchez, José Mira*
  - “An associative cortical model of language understanding and action planning” (II-402)  
*Andreas Knoblauch, Heiner Markert, Günther Palm*
- Session: **Evolutionary Computation IV** June, 16. 11:40–13:40 Room: B  
 Chair: José Santos Reyes  
 Co-Chair: Michael Affenzeller
- “A Genetic Approach to Data Dimensionality Reduction Using a Special Initial Population” (II-307)  
*M. Borahan Tümer, Mert C. Demir*
  - “Genetic Algorithms for Multiobjective Controller Design” (II-239)  
*Miguel Martínez Iranzo, Javier Sanchis, Xavier Blasco*
  - “GA-Selection Revisited from an ES-Driven Point of View” (II-259)  
*Michael Affenzeller, Stefan Wagner, Stephan Winkler*
  - “Neural Clustering Analysis of Macroevolutionary and Genetic Algorithms in the Evolution of Robot Controllers” (II-412)  
*Jose Antonio Becerra Permy, José Santos Reyes*
  - “A Comparison of Genetic Algorithm and Particle Swarm Optimization for excess return evaluation in Stock Markets” (II-219)  
*Jusang Lee, Sangwook Lee, Seokcheol Chang, Byung Ha Ahn*
  - “Playing a toy-grammar with GCS” (II-297)  
*Olgierd Unold*
- Session: **Bioinspired Apps V** June, 16. 11:40–13:40 Room: C  
 Chair: Ajith Abraham  
 Co-Chair: Mariano Rincón Zamorano
- “MEPIDS: Multi-Expression Programming for Intrusion Detection System” (II-159)  
*Crina Grosan, Ajith Abraham, San Yong Han*
  - “Knowledge Modeling for the Traffic Sign Recognition Task” (I-511)  
*Mariano Rincón Zamorano, Sergio Lafuente-Arroyo, Saturnino Maldonado-Bascón*
  - “On-line training of Neural Networks: a sliding window approach for the Levenberg-Marquardt algorithm” (II-574)  
*Fernando Morgado Dias, Ana Luisa Lopes Antunes, José Vieira, Alexandre Mota*
  - “On the Connection between the Human Visual System and Independent Component Analysis” (II-592)  
*Susana Hornillo-Mellado, Rubén Martín-Clemente, Carlos G. Puntonet, José I. Acha*
  - “Construction and VHDL Implementation of a Fully Local Network with Good Reconstruction Properties of the Inputs” (II-382)  
*Joël Chavas, Demian Battaglia, Andres Cicuttin, Riccardo Zecchina*
  - “Transistor-Level Circuit Experiments Using Evolvable Hardware” (II-363)  
*Adrian Stoica, Ricardo Zebulum, Didier Keymeulen, Taher Daud*
- Session: **Posters** June, 16. 16:30–18:00 Room: P  
 Chair: Ingo R. Keck  
 Co-Chair: Juan Manuel Górriz
- “Fluctuation Dynamics in Electroencephalogram Time Series” (I-197)  
*In-Ho Song, Doo-Soo Lee*
  - “An Augmented Reality Visual Prosthesis for People Affected by Tunneling Vision” (I-322)  
*Javier Toledo, Jose J. Martinez, Francisco J. Garrigos, Jose Manuel Ferrández*
  - “Connectionist contribution to building real-world ontologies” (I-492)  
*Miloslaw L. Frey*
  - “A New Immunotronic Approach to Hardware Fault Detection Using Symbiotic Evolution” (II-129)  
*Sanghyung Lee, Euntai Kim, Eunjo Song, Mignon Park*

- “A basic approach to reduce the complexity of a self-generated fuzzy rule-table for function approximation by use of symbolic regression in 1D and 2D cases” (II-139)  
*Gines Rubio, Hector Pomares, Ignacio Rojas, Alberto Guillén*
- “Parallel Evolutionary Computation: Application of an EA to Controller Design” (II-149)  
*Manuel Parrilla, Joaquín Aranda, Sebastián Dormido-Canto*
- “A study of heuristic techniques inspired in natural process for the solution of the container fill problem” (II-169)  
*Miguel Delgado Pineda, José Manuel De Pedro Salinas, Joaquín Aranda*
- “Towards a methodology to search for near-optimal representations in classification problems” (II-288)  
*Manuel del Valle, Beatriz Sánchez, Luis F. Lago-Fernández, Fernando J. Corbacho*
- “Information Retrieval and Classification with Wavelets and Support Vector Machines” (II-545)  
*Sebastián Dormido-Canto, Jesus Vega, José Sánchez, Gonzalo Farias*
- “A New Approach to Clustering and Object Detection with Independent Component Analysis” (II-555)  
*Ingo R. Keck, Salua Nassabay, Carlos G. Puntonet, Elmar Lang*
- “Bispectra Analysis-based VAD for Robust Speech Recognition” (II-564)  
*Juan Manuel Górriz, Carlos G. Puntonet, Javier Ramírez, José Carlos Segura*
- “Image Classifier for the TJ-II Thomson Scattering Diagnostic: Evaluation with a Feed Forward Neural Network” (II-602)  
*Gonzalo Farias, Raquel Dormido, Matilde Santos, Natividad Duro*

- Session: Plenary III June, 17. 09:00–10:00 Room: A  
**“Embodied Models of Natural Computation”**  
*Dana Ballard*
- Session: Neural Models and Experimental Data I June, 17. 10:00–11:20 Room: A  
**“Hybridation of computer neuron models and experimental data: working out solutions”**  
Organizer & Chair: Oscar Herreras  
Co-Chair: Gonzalo G. de Polavieja
  - “Realistic stimulation through advanced dynamic-clamp protocols” (I-96)  
*Carlos Muñiz, Sara Arganda, Francisco de Borja Rodríguez, Gonzalo G. de Polavieja*
  - “Interacting slow and fast dynamics in precise spiking-bursting neurons” (I-106)  
*Fabiano Baroni, Joaquín J. Torres, Pablo Varona*
  - “An integral model of spreading depression: from neuron channels to field potentials” (I-116)  
*Iouliia Makarova, Iria R. Cepeda, Fivos Panetsos, Oscar Herreras*
  - “Separation of Extracellular Spikes: When Wavelet Based Methods Outperform” (I-123)  
*Alexey Pavlov, Valery Makarov, Iouliia Makarova, Fivos Panetsos*
- Session: Evolutionary Computation V June, 17. 10:00–11:20 Room: B  
**“Genetic Algorithms for Optimization and Constraint Satisfaction”**  
Organizer & Chair: Ramiro Varela Arias  
Co-Chair: Camino Rodríguez Vela
  - “Converge Analysis of a GA-ICA algorithm” (II-51)  
*Juan Manuel Górriz, Carlos G. Puntonet, Fernando Rojas Ruiz, E.G. Medialdea*
  - “An Evolutionary Strategy for the Multidimensional 0-1 Knapsack Problem based on Genetic Computation of Surrogate Multipliers” (II-61)  
*Cesar L. Alonso Gonzalez, Fernando Caro Sañudo, Jose Luis Montaña Arnaiz*
  - “An Evolutionary Approach to Designing and Solving Fuzzy Job-Shop Problems” (II-71)  
*Inés González Rodríguez, Camino Rodríguez Vela, Jorge Puente Peinador*
  - “Memetic Algorithms with Partial Lamarckism for the Shortest Common Supersequence Problem” (II-81)  
*Carlos Cotta*
- Session: **Bioinspired Applications VI** June, 17. 10:00–11:20 Room: C  
Chair: Jose Dorronsoro  
Co-Chair: Javier Jesus Sanchez Medina
  - “Boosting Parallel Perceptrons for Label Noise Reduction in Classification Problems” (II-584)  
*Iván Cantador, Jose Dorronsoro*
  - “Evolution and Evaluation in Knowledge Fusion System” (II-189)  
*Gou Jin, Yang Jiangang, Chen Quian*
  - “Computerized Adaptive Tests and Item Response Theory on a Distance Education Platform” (II-612)  
*Pedro Antonio Salcedo Lagos, María Angélica Punninghoff Junemann, Ricardo Contreras Arriagada*
  - “Stochastic Vs Deterministic Traffic Simulator. Comparative Study for its Use within a Traffic Light Cycles Optimization Architecture” (II-622)  
*Javier Jesus Sanchez Medina, Manuel Galan Moreno, Enrique Rubio Royo*
- Session: Neural Models and Experimental Data II June, 17. 11:40–13:40 Room: A  
**“Hybridation of computer neuron models and experimental data: working out solutions II”**  
Organizer & Chair: Oscar Herreras  
Co-Chair: Maria V. Sanchez-Vives
  - “Rules and roles of dendritic spikes in CA1 pyramidal cells: a computational study.” (I-145)  
*José M. Ibarz, Iouliia Makarova, Iria R. Cepeda, Oscar Herreras*
  - “Structural statistical properties of the connectivity could underlie the difference in activity propagation velocities in visual and olfactory cortices” (I-134)  
*Maria V. Sanchez-Vives, Albert Compte*
  - “Slow conductances encode stimulus history into spike shapes” (I-152)  
*Gonzalo G. de Polavieja, Anette Harsch, Hugh Robinson, Mikko Juusola*

- “Comparison of Plasticity of Self-Optimizing Neural Networks and Natural Neural Networks” (I-158)  
*Adrian Horzyk, Ryszard Tadeusiewicz*
  - “A Multiplexed Current Source Portable Stimulator Architecture for a Visual Cortical Neuroprosthesis” (I-313)  
*Jose Manuel Ferrández, María Paula Bonomini, Eduardo Fernández*
  - “Induced behavior in a real agent using the Multilevel Darwinist Brain” (II-422)  
*Francisco Bellas, Jose Antonio Becerra Permu, Richard Duro*
- Session: **Hybrid Computation** June, 17. 11:40–13:40 Room: B  
 Chair: Ignacio Rojas  
 Co-Chair: Ernesto Burattini
- “Using fuzzy clustering technique for function approximation to approximate ECG signals” (II-535)  
*Alberto Guillén, Ignacio Rojas, Eduardo Ros, Luis J. Herrera*
  - “Spatial Reasoning Based on Rules” (I-472)  
*Haibin Sun, Wenhui Li*
  - “Interval-valued neural multi-adjoint logic programs” (I-521)  
*Jesus Medina, Enrique Merida-Casermeyro, Manuel Ojeda-Aciego*
  - “Agent WiSARD in a 3D world” (II-269)  
*Ernesto Burattini, Paolo Coraggio, Massimo De Gregorio, Mariacarla Staffa*
  - “One Generalization of the Naive Bayes to Fuzzy Sets and the Design of the Fuzzy Naive Bayes Classifier” (II-278)  
*Jiacheng Zheng, Yongchuan Tang*
- Session: Bioinspired Applications VII June, 17. 11:40–13:40 Room: C  
**“Robotics and Neurobiology”**  
 Organizer & Chair: Eris Chinellato  
 Co-Chair: Emilia I. Barakova
- “Avoidance Behavior controlled by a Model of Vertebrate Midbrain Mechanism” (I-340)  
*David P.M. Northmore, Brett J. Graham*
  - “Transition cells and neural fields for navigation and planning” (I-348)  
*Nicolas Cuperlier, Mathias Quoy, Philippe Laroque, Philippe Gaussier*
  - “Spatial navigation based on novelty mediated autobiographical memory” (I-358)  
*Emilia I. Barakova, Tino Lourens*
  - “Vison and Grasping: Humans vs. Robots” (I-368)  
*Eris Chinellato, Angel P. del Pobil*
  - “Evolved Neural Reflex-Oscillators for Walking Machines” (I-378)  
*Arndt von Twickel, Frank Pasemann*
  - “A Haptic System for the Lucs Haptic Hand I” (I-388)  
*Magnus Johnsson, Robert Pallbo, Christian Balkenius*

## Social Program

### June 15, Wednesday

20:00 h. - Official welcome reception cocktail and folklore at the “Club Náutico” in Las Palmas de Gran Canaria (casual wear).

### June 16, Thursday

20:00 h. - Official conference dinner at Las Palmas de Gran Canaria (casual wear).

### June 17, Friday

Afternoon - Tour to Ingenio, Guayadeque and Agüimes (*Optional*).

### June 18, Saturday

Morning - Tour to Teror and Arucas (*Optional*).

## Internet connection

During the conference there will be wireless access (802.11b/802.11g compatible) to Internet available inside and near the conference rooms, and also some wired connections in a specific place.

## Registration Fees

The registration form must be returned to the Conference Technical Secretariat (ESOC, please, see the address in the next page) at your earliest convenience. The form must be accompanied by the payment in Euros. No registration will be considered until the payment is received.

Registrations fees	Before April 30 th	After April 30 th
Standard (*)	450 €	500 €
Session Organizer (*)	350 €	400 €
Accompanying Person (**)	250 €	290 €

(\*) Includes coffe breaks, meals, social events (welcome reception cocktail+folklore and official dinner), and the “Lecture Notes in Computer Science” books of the work-conference proceedings.

(\*\*) Includes meals, social events (welcome reception cocktail+folklore and official dinner).

## General Information

### Congress venue

HOTEL MELIA LAS PALMAS  
Calle Gomera, 6  
Las Palmas de Gran Canaria (Spain)

### Technical Secretariat of the Conference

Please, contact the Technical Secretariat for any information or details about registration, accomodation, travels, etc.

ESOC, s.l.  
Poeta Vila y Blanco, 8 - 1º  
E-03003 Alicante (Spain)  
Phone: (+34) 965-22-99-40  
Fax: (+34) 965-92-23-46  
E-mail: [info@esoc.es](mailto:info@esoc.es)

Since 16:30 h. June 14, and during the Conference, the Secretariat will maintain a desk at the congress venue. Previous registration will be necessary to attend the Conference (<http://www.esoc.es/tpv/inscripcion05.html>).

Contact URL <http://www.iwinac.uned.es/iwinac2005/>

## Travel Information

The most convenient way to get to Las Palmas de Gran Canaria is by air, directly or via Madrid or Barcelona. The main Spanish airline is IBERIA but there are many more that operate in the island. The airport is 24 km (about 20 minutes by motorway) far from the city. A taxi from the Airport to Hotel Melia could cost around 20 euros. There is a regular bus (number 60, once every hour) from the airport to the city (around 2 euros).

### Language

English will be the official language of IWINAC2005. Simultaneous translation will *not* be provided.

### Climate

Las Palmas de Gran Canaria is located at about 28.06°N, 15.25°W, and near the sea. The climate in Las Palmas is sunny and warm, the temperature in June can vary from more than 25°C daily to 18°C nightly with an average temperature of 21°C.

### Banks

Business is transacted from 09:00 to 14:00 h. Monday to Friday. Money can be changed outside normal banking hours at Hotels, Travel Agencies and other business, displaying a “*Cambio/Change*” sign. Take your Passport or Identity Card with you when changing travellers checks.

### Currency

The monetary unit in Spain is the *EURO*. Coins: 1, 2, 5, 10, 20 and 50 cents; 1 and 2 Eur. Banknotes: 5, 10, 20, 50, 100, 200 and 500 Euros. All international Credit Cards (Visa, American Express, Master Card, Eurocard, Diners Club, etc.) are widely accepted by Hotels, Restaurants and Shops.

### Tipping

Since the service charge is normally included in restaurant and hotel bills, tipping is optional.

### Electricity

Electric supply is AC 220 V. / 50 Hz. Standard continental two round pin plugs for appliances.

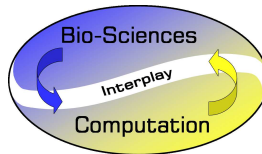
### Assistance and insurance

Participants are advised to make their own arrangements regarding travel insurance and medical assistance during the Conference. Neither the Organization nor the Conference Secretariat is able to accept any responsibility whatsoever for damage or injury to persons or their belongings during the Conference.

### Additional information

You can find more information (maps, addresses, etc.) through the web pages:

- Touristic information about Gran Canaria island:  
<http://www.grancanaria.com/>  
<http://gias720.dis.ulpgc.es/Canarias/turista.html>
- Town Council of Las Palmas de Gran Canaria  
<http://www.laspalmasgc.es/> (in Spanish)



IWINAC2005



Universidad Nacional de  
Educación a Distancia (UNED)



Universidad de Las Palmas  
de Gran Canaria (ULPGC)



Ministerio de Educación y Ciencia



Ayuntamiento de  
Las Palmas de G.C.



La Caja de Canarias



Las Palmas de Gran Canaria  
Convention Bureau



Cabildo de Gran Canaria



Gobierno de Canarias

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**Congress Venue:**

Hotel Meliá Las Palmas de G. C. (Canary Islands)

**June 15–18, 2005**

<http://www.iwinac.uned.es/iwinac2005/>

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