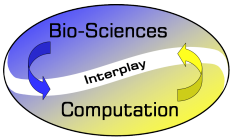

IWINAC2013

5th INTERNATIONAL WORK-CONFERENCE ON THE INTERPLAY BETWEEN NATURAL AND ARTIFICIAL COMPUTATION

FINAL PROGRAM

Mallorca, Balearic Islands, Spain.

June 10–14, 2013

Organized by

Universidad Nacional de Educación a Distancia (UNED)

Universidad Politécnica de Cartagena

Contact URL `http://www.iwinac.org/iwinac2013/`

Contents

Acknowledgments

IWINAC2013 still owes too much to our friend Prof. Mira. As a pioneer in the field of Cybernetics, he enthusiastically promoted and organized these interdisciplinary meetings in the past. We still miss him and we want to dedicate IWINAC2013 in memoriam to Prof. Mira.

IWINAC2013 has been organized by the Universidad Nacional de Educación a Distancia (UNED) and the Universidad Politécnica de Cartagena (UPCT) in cooperation with the Mallorca UNED Associated Center and the Universitat de les Illes Balears.

We acknowledge the sponsorship and/or technical and logistic support from:

- Ibero-American Programme for Science, Technology and Development (CYTED). Red de Computación Natural y Artificial para la Salud.
- Spanish Ministerio de Ciencia e Innovación. Red Nacional en Computación Natural y Artificial
- Universidad Nacional de Educación a Distancia.
- Universidad Politécnica de Cartagena.
- UNED Associated Center in Mallorca.
- Universitat de les Illes Balears.
- Apliquem Microones 21, s.l.

Scope

This interdisciplinary meeting, with focus on the interplay between Nature and Computation, expands the scope of neural computation at the physical level to cope with symbols and knowledge level models of cognitive and social processes. The global purpose is to offer a forum for discussion and exchange of ideas between scientists and engineers from fields such as Electronic Engineering, Artificial Intelligence, Knowledge Engineering, Physics, Mathematics, Computation, Artificial Vision, Situated Robotics, Neurophysiology, Cognitive Science, Linguistics and Philosophy, trying to contribute to the answer of two basic questions:

I: From Computation to Sciences of Natural.

What can Physics, Mathematics, Engineering, 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 computation to model and improve our understanding of natural phenomena.

II: From Sciences of Natural to Computation.

How can Engineering, Mathematics, 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.

Conference Organization

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Dario Floreano — *EPFL (Switzerland)*
Pedro Gómez-Vilda — *Univ. Politécnica de Madrid (Spain)*

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[continued]

[continued] **Scientific Committee (Referees)**

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Marley Vellasco, Brazil
Rafael Verdú-Monedero, Spain
Lipo Wang, Singapore
Stefan Wermter, UK
Hujun Yin, UK
Changjiu Zhou, Singapore

PROGRAM OUTLINE

Monday June 10	
morning	*Free time*
17:00–20:00	*Registration at Technical Secretariat desk*

Tuesday June 11			
08:45–09:00	*Opening Ceremony*		
09:00–10:00	*Plenary Session I:* Prof. Rodolfo Llinás		
10:00–11:00	Room A:	Room B:	Room C:
	Bioinspired Applications I	Probabilistic Reasoning	Computer Vision in Smart Cities
11:00–11:30	*Coffee break*		
11:30–12:30	Room A:	Room B:	Room C:
	Plasticity & Modeling	CYTED Session I	Evolutionary Methods
12:30–13:30			Bioinspired Apps. II
14:00–	*Lunch*		
16:00–16:40		CYTED Session II	
16:40–18:00	*Room B: (meeting for Ibero-American researchers) Reunión red CYTED CANS (research network)*		
	Free time		
20:00–	*Welcome reception and cocktail at Congress Venue*		

Please, see detailed session contents, and social events in pages 10 through 20.

PROGRAM OUTLINE

Wednesday June 12			
09:00–10:00	*Plenary Session II:* Prof. Pedro Gómez-Vilda		
10:00–11:00	*Plenary Session III:* Prof. Rodolfo Llinás		
11:00–11:30	*Coffee break*		
11:30–13:30	Room A:	Room B:	Room C:
	Quality of Life Technologies	Image Understanding Applications	Web Intelligence meets Neuroscience
14:00–	*Lunch*		
16:00–17:00	Posters Attending Session		
	Free time		
18:30–	*Buses from Hotel to Official Dinner at Puerto de Sóller*		

Thursday June 13			
09:00–10:00	*Plenary Session IV:* Prof. Dario Floreano		
10:00–11:00	Room A:	Room B:	Room C:
	MRI Applications	Cognitive Robots I	Smart Spaces I
11:00–11:30	*Coffee break*		
11:30–13:30	Room A:	Room B:	Room C:
	AI applied to Medical Aid	Cognitive Robots II	Smart Spaces II
13:30–13:40	*Closing Ceremony*		
afternoon	*Free time*		

Friday June 14	
09:00–13:00	*Reserved only for special working groups meetings*
afternoon	*Free time*

Please, see detailed session contents, and social events in pages 10 through 20.

- Session: Plenary I June, 11. 09:00–10:00 Room: A
  "**Invited speaker Prof. Rodolfo Llinás**"

- Session: **Bioinspired Applications I** June, 11. 10:00–11:00 Room: A
  Moderator: Guido Bologna

  - "Modelling Prior and Retrospective Awareness of Actions"
    Dilhan Thilakarathne, Jan Treur
  - "Emotional stress detection in contradictory versus self-consistent speech by means of voice biometrical signature"
    Victoria Rodellar, Daniel Palacios, Elena Bartolomé, Pedro Gómez-Vilda
  - "Vision Substitution Experiments with See ColOr"
    Guido Bologna, Juan Gomez, Thierry Pun

- Session: Probabilistic Reasoning June, 11. 10:00–11:00 Room: B
  "**Probabilistic Reasoning**"
  Organizer & Chair: Manuel Luque Gallego
  Co-Chair: Manuel Arias Calleja

  - "Fast approximate inference in hybrid Bayesian networks using dynamic discretisation"
    Helge Langseth, David Marquez, Martin Neil
  - "An influence diagram for the collaboration in e-learning environments"
    Antonio R Anaya, Manuel Luque
  - "A Bayesian model for lexical availability of Chilean High School students in Mathematics"
    Pedro Salcedo Lagos, Anita Ferreira Cabrera, Fernanda Barrientos Contreras

- Session: Computer Vision June, 11. 10:00–11:00 Room: C
  "**Computer Vision in Smart Cities**"
  Organizer & Chair: Antonio Sanz
  Co-Chair: Juan José Pantrigo

  - "Onboard vision system for bus lane monitoring"
    David Fernández-López, Antonio Sanz, Juan J Pantrigo, María Luisa Delgado, Raúl Cabido
  - "Urban Traffic Surveillance in Smart Cities Using Radar Images"
    Jesús Sánchez-Oro, David Fernández-López, Raúl Cabido, Antonio Sanz, Juan J Pantrigo
  - "Vehicle Tracking by Simultaneous Detection and Viewpoint Estimation"
    Ricardo Guerrero-Gómez-Olmedo, Roberto Lopez-Sastre, Saturnino Maldonado, Antonio Fernández-Caballero

- Session: **Plasticity & Modeling** June, 11. 11:30–13:30 Room: A
  Moderator: Santi Chillemi

  - "A Neural Network Simulation of Spreading Depression"
    Daniel Castello Paiva, Diego Andina, Francisco Peláez
  - "Artificial Metaplasticity"
    Marta de Pablos , Diego Andina
  - "Neuron threshold variability in an olfactory model improves odorant discrimination"
    Aaron Montero, Ramon Huerta, Francisco B. Rodríguez
  - "Contrast enhancement mechanisms in the retinothalamic circuitry"
    Rubén Ferreiroa García, Eduardo Sánchez Vila
  - "Neural Spike Activation in Hippocampal Cultures Using Hebbian Electrical Stimulation"
    Víctor Lorente, José Manuel Ferrandez, Francisco J. Garrigos Guerrero, Felix de la Paz Lopez, Jose Manuel Cuadra Troncoso, Jose Ramon Alvarez-Sanchez, Eduardo Fernandez
  - "Thalamo-cortical network and seizure dynamics: a computational study"
    Santi Chillemi

- Session: CYTED I June, 11. 11:30–13:30 Room: B
  "**CYTED "Artificial and Natural Computation for Health" (CANS) research network**"
  Organizer & Chair: José Manuel Ferrández Vicente
  Co-Chair: Félix de la Paz López

  - "Heart Sound Segmentation in Noisy Environments"
    Santiago Murillo , Cristian Castro Hoyos, German Castellanos-Dominguez
  - "Kernel Spectral Clustering for Motion Tracking: A first approach"
    Diego Peluffo-Ordoñez, Sergio Garcia-Vega, German Castellanos-Dominguez
  - "Multilabeler decision by SVM approach" *Santiago Murillo, Diego Peluffo Ordoñez, Julián David Arias Londoño, German Castellanos-Dominguez*
  - "New cues in low-frequency of speech for automatic detection of Parkinson's disease" *Elkyn Alexander Belalcázar-Bolaños, Juan Orozco-Arroyave, Julián David Arias-Londoño, Jesús Francisco Vargas Bonilla, German Castellanos-Dominguez, Elmar Nöth*
  - "Computer-Aided Detection of Microcalcifications in Digital Mammograms to Support Early Diagnosis of..."
    Nayid Triana, Alexander Cerquera
  - "Influence of interactions between virtual channels in cochlear implants"
    Ernesto A. Martínez-Rams, Vicente Garceran-Hernandez

- Session: **Evolutionary Methods** June, 11. 11:30–12:30 Room: C
  Moderator: Joost N. Kok

  - "Ant Colony Algorithms for the Dynamic Vehicle Routing Problem with Time Windows"
    Barry van Veen, Michael Emmerich, Zhiwei Yang, Thomas Baeck, Joost N. Kok
  - "Pattern Detection in Images using LBP-based Relational Operators"
    José María Molina Casado, Enrique J. Carmona Suarez
  - "Cancer stem cell modeling using a cellular automaton"
    Ángel Monteagudo, Jose Santos Reyes

- Session: **Bioinspired Applications II** June, 11. 12:30–13:50 Room: C
  Moderator: Xosé R. Fdez-Vidal

  - "A Neural Network approximation of L-MCRS dynamics for Reinforcement Learning experiments"
    José Manuel López Guede, Manuel Graña, Jose Antonio Ramon Hernanz, Fernando Oterino
  - "Addressing remitting behavior using an ordinal classi..."
    Pilar Campoy-Muñoz, Pedro Antonio Gutierrez, Cesar Hervas Martinez
  - "Greedy sparsification WM algorithm for endmember induction in hyperspectral images"
    Ion Marqués, Manuel Graña
  - "Dynamic Saliency from Adaptative Whitening"
    Víctor Leborán Alvarez, Antón García-Díaz, Xosé R. Fdez-Vidal, Xose Manuel Pardo

- Session: CYTED II June, 11. 16:00–16:40 Room: B
  "**CYTED "Artificial and Natural Computation for Health" (CANS) research network**"
  Organizer & Chair: José Manuel Ferrández Vicente
  Co-Chair: Félix de la Paz López

  - "Using Ant Colony Optimization for Edge Detection in Gray Scale Images"
    Ricardo Contreras, Maria Pinninghoff, Jaime Ortega
  - "Dealing with bullying through genetic algorithms"
    Maria Pinninghoff, Pedro Salcedo Lagos, Ricardo Contreras, Andrea Yáñez, Eduardo Oportus

- Session: Plenary II June, 12. 09:00–10:00 Room: A
  "**Invited speaker Prof. Pedro Gómez-Vilda**"

- Session: Plenary III June, 12. 10:00–11:00 Room: A
  "**Invited speaker Prof. Rodolfo Llinás**"

- Session: QoLTs June, 12. 11:30–13:50 Room: A
  "**Quality of Life Technologies (QoLTs)**"
  Organizer & Chair: Oscar Martinez Mozos
  Co-Chair: José Manuel Ferrandez Vicente

  - "Robot Cognitive Stimulation for the Elderly"
    Adriana Tapus, Alexandra-Maria P Vieru
  - "The Intelligent Room for Elderly Care"
    Oscar Martinez Mozos, Tokuo Tsuji, Hyunuk Chae, Shunya Kuwahata, Tsutomu Hasegawa, Ken'ichi Morooka, Ryo Kurazume
  - "A Method for Estimating Patient Specific Parameters for Simulation of Tissue Deformation by Finite. . . "
    Ken'ichi Morooka, Shuji Sonoki, Ryo Kurazume, Tsutomu Hasegawa
  - "REEM service robot: how may I help you?"
    Luca Marchionni, Jordi Pages, Jordi Adell, Jose Rafael Capriles, Hilario Tome
  - "Training study approaches for a SVM-based BCI: adaptation to the model vs adaptation to the user"
    Enrique Hortal, Eduardo Iáñez, Andrés Úbeda, José M. Azorín, Eduardo Fernandez
  - "Evaluation of a Telepresence Robot for the Elderly. A Spanish Experience"
    Javier Gonzalez-Jimenez, Cipriano Galindo, Carlos Gutierrez
  - "Empirical Analysis of a BCI and an EOG Interface to Control a Robot"
    Eduardo Iáñez, Andrés Úbeda, Enrique Hortal, José M. Azorín, Eduardo Fernandez

- Session: Image Underst. June, 12. 11:30–13:10 Room: B
  "**Biomedical and Industrial Image Understanding Applications**"
  Organizer & Chair: Mª Consuelo Bastida Jumilla
  Co-Chair: Rosa Mª Menchón Lara

  - "Comparison of finite difference and B-spline deformable models in characterization of 3D data" *Rafael Berenguer-Vidal, Rafael Verdú-Monedero, Rosa-María Menchón-Lara, Álvar Legaz-Aparicio*
  - "Automatic Evaluation of Carotid Intima-Media Thickness in Ultrasounds using Machine Learning" *Rosa-María Menchón-Lara, M-Consuelo Bastida-Jumilla, Antonio González-López, Jose Luis Sancho-Gomez*
  - "Active Contours Tool for the Common Carotid Artery Layers Segmentation in Ultrasound Images" *M-Consuelo Bastida-Jumilla, Rosa-María Menchón-Lara, Juan Morales Sanchez, Rafael Berenguer-Vidal*
  - "Early computer aided diagnosis of Parkinson's disease based on nearest neighbor strategy and striatum activation threshold"
    Pablo Padilla, Juan M Gorriz, Javier Ramirez, Diego Salas-Gonzalez, Ignacio Alvarez Illan
  - "Texture Features Based Detection of Parkinson's Disease on DaTSCAN images" *Francisco Jesús Martínez-Murcia, Juan M Gorriz, Javier Ramirez, Ignacio Alvarez Illan, Carlos G Puntonet*

- Session: Web Int. Neuro. June, 12. 11:30–13:30 Room: C
  "**Web Intelligence meets Neuroscience**"
  Organizer & Chair: Eduardo M. Sánchez Vila
  Co-Chair: Luis Martínez Otero

  - "Evaluation of emotions and the user's brainwaves"
    Montero Francisco, Víctor López-Jaquero, Pascual González
  - "Computer stress monitoring through fusion of thermal-infrared-based facial emotion detection and act"
    José Carlos Castillo, Juan Serrano-Cuerda, Marina Sokolova, Maria Teresa Lopez Bonal, Antonio Fernández-Caballero
  - "Recommender systems: a case study in the gastronomic domain"
    Fernando Sánchez-Vilas, Fabián Pérez Lousame, Eduardo Sánchez Vila
  - "Neural and physiological correlates of choice behavior"
    Luis Martinez
  - "Personal Agents for managing social notifications in an e-learning environment"
    Miguel Coronado, Felipe Echanique, Carlos A. Iglesias
  - "Mental state signatures in brain signals"
    Santiago Canals

- Session: **Posters attending** June, 12. 16:00–17:00 Room: P
  Chair: José Manuel Ferrández
  Co-Chair: Javier Toledo Moreo

  1. "Modeling the effect of fixational eye movements in natural scenes"
     Andrés Olmedo Payá, Antonio Martínez Álvarez, Sergio Cuenca Asensi, José Manuel Ferrandez, Eduardo Fernandez
  2. "A Novel Approach for Quantitative Analysis of 3D Phosphenes"
     Cristina Soto Sanchez, Andrés Olmedo Payá, Daniel de Santos Sierra, Carlos Agullo Perez, Eduardo Fernandez
  3. "Inverse allometry: foundations for a bioinspired LVH-prediction model"
     Maria Bonomini, Fernando Ingallina, Valeria Barone, Pedro D. Arini
  4. "Cochlear Implant: Transcutaneous Transmission Link with OFDM"
     Vicente Garceran-Hernandez, Ernesto A. Martínez-Rams
  5. "Deficitary nervous excitability and subjective contraction of time. Time-dispersive model"
     Isabel Gonzalo Fonrodona, Miguel A. Porras
  6. "Hybrid Tabu Search for Fuzzy Job Shop"
     Juan José Palacios, Jorge Puente, Inés González-Rodríguez, Camino Rodriguez Vela
  7. "Statistical characteristics of portal images and their influence in noise reduction"
     Antonio González-López, María-Consuelo Bastida-Jumilla, Jorge Larrey-Ruiz, Juan Morales Sanchez
  8. "Automatic orientation of functional brain images for multiplataform software"
     Ignacio Alvarez Illan, Juan M Gorriz, Javier Ramirez, Diego Salas-Gonzalez, Francisco Jesús Martínez-Murcia, Fermin Segovia Roman, Carlos G Puntonet
  9. "Solving Number Series with Simple Recurrent Networks"
     Stefan Glüge, Andreas Wendemuth
  10. "Detection method for phase synchronization in a population of spiking neurons"
      Manuel Lopez Martin, Francisco B. Rodríguez
  11. "PIR-based motion patterns classification for AmI systems"
      Francisco Fernandez-Luque, Juan Zapata, Ramon Ruiz Merino
  12. "Motor Imagery Classification for BCI using Common Spatial Patterns and Feature Relevance Analysis"
      Luisa Velásquez-Martínez, Andrés Álvarez-Meza, German Castellanos-Dominguez

13. "High-Level Hardware Description of a CNN-based Algorithm for Short Exposure Stellar Images Processing"
Jose Javier Martinez-Alvarez, Francisco J. Garrigos Guerrero, Javier Toledo, Carlos Colodro-Conde, Isidro Villo-Perez, José Manuel Ferrandez

14. "Analysis of Connection Schemes between the ICU and the DPU of the NISP Instrument of the Euclid Miss"
Carlos Colodro-Conde, Rafael Toledo-Moreo, José Javier Díaz-García, Oscar Manuel Tubío-Araujo, Isidro Villo-Perez, Javier Toledo, Jose Javier Martinez-Alvarez, Francisco J. Garrigos Guerrero, José Manuel Ferrandez, Rafael Rebolo

15. "Discriminant Splitting of Regions in Traffic Sign Recognition"
Sergio Lafuente, Roberto López, Saturnino Maldonado, Rafael Martinez Tomas

16. "Detection of Fishes in Turbulent Waters based On Image Analisys"
Alvaro Rodriguez, Juan R. Rabuñal, Maria Bermudez, Jerónimo Puertas

17. "Experimental Plataform for Accelerate the Training of ANNs with Genetic Algorithm and Embedded Syste..."
Jorge Fe, R.J. Aliaga, R. Gadea

18. "Segmentation of Weld Regions in Radiographic Images: A Knowledge-based Efficient Solution"
Rafael Vilar, Juan Zapata

19. "Automatic Detection of Facial Landmarks in Images with Different Sources of Variations"
Angel Sanchez, Ana Belen Moreno Diaz, Jose F. Velez

20. "An empirical study of Actor-Critic methods for feedback controllers of ball-screw drivers"
Borja Fernández Gauna, Igor Ansoategui, Ismael Etxeberria-Agiriano, Manuel Graña

21. "Robust Solutions for a Robotic Manipulator Optimization Problem"
Ricardo Soto, Broderick Crawford, Eric Monfroy

22. "On the identification and establishment of topological spatial relations"
Sergio Miguel-Tomé

23. "Automatic ROI selection using SOM modelling in structural Brain MRI"
Andres Ortiz García, Juan M Gorriz, Javier Ramirez, Diego Salas-Gonzalez

- Session: Plenary IV June, 13. 09:00–10:00 Room: A
  "**Invited speaker Prof. Dario Floreano**"

- Session: **MRI Applications** June, 13. 10:00–11:00 Room: A
  Moderator: Manuel Graña

  – "Meta-ensembles of classifiers for Alzheimer's disease detection using independent ROI features" *Borja Ayerdi, Alexandre M Savio, Manuel Graña*

  – "Results on a Lattice Computing based group analysis of schizophrenic patients on resting state fMRI" *Darya Chyzhyk, Manuel Graña*

  – "Cocaine Dependent Classification on MRI Data extracting Features from Voxel Based Morphometry" *Maite Termenon, Darya Chyzhyk, Manuel Graña, Alberto Barros-loscertales, Cesar Avila*

- Session: Cognitive Robotics I June, 13. 10:00–11:00 Room: B
  "**Cognitive Robotics**"
  Organizer & Chair: Javier de Lope Asiaín
  Co-Chair: Darío Maravall Gómez-Allende

  – "Improved polar scan-matching using an advanced line segmentation algorithm" *Israel Navarro Santosjuanes, Jose Manuel Cuadra Troncoso, Felix de la Paz Lopez, Raúl Arnau Prieto*

  – "Reactive Navigation and Online SLAM in Autonomous Frontier-based Exploration" *Raúl Arnau Prieto, Jose Manuel Cuadra Troncoso, Jose Ramon Alvarez-Sanchez, Israel Navarro Santosjuanes*

  – "Multiscale Dynamic Learning in Cognitive Robotics"
  Pilar Caamano, Andres Faina, Francisco Bellas, Richard Duro

- Session: Smart Spaces I June, 13. 10:00–11:00 Room: C
  "**Smart Spaces for Health, Safety and Well-being**"
  Organizer & Chair: Rafael Martínez Tomás
  Co-Chair: Antonio Fernández-Caballero

  – "A Data Fusion Perspective on Human Motion Analysis including Multiple Camera Applications" *Rodrigo Cilla, Patricio Guisado Miguel Angel, Antonio Berlanga, Jose Manuel Molina Lopez*

  – "Evaluation of a 3D Video Conference System based on Multi-Camera Motion Parallax" *Miguel A. Muñoz, Jonatan Martinez, José Pascual Molina, Pascual González, Antonio Fernández-Caballero*

  – "Abandoned object detection on controlled scenes using Kinect"
  Antonio Collazos, David Fernández-López, Antonio Sanz, Juan J Pantrigo, María Luisa Delgado

- Session: AI Med Aid June, 13. 11:30–13:30 Room: A
  "**Artificial Intelligence applied to Medical Aid**"
  Organizer & Chair: Daniel Ruiz

  - "Interplay between natural and artificial intelligence in training autistic children with robots"
    Emilia I. Barakova, Tino Lourens
  - "Use of multilayer perceptron vs. distance measurement methods for classication of exercises in tele..." *Oscar Marin-Alonso, Daniel Ruiz, Antonio Soriano, Joaquin D. Perez-Garcia*
  - "Application of Artificial Metaplasticity Neural Networks to Cardiac Arrhythmias Classification"
    Y Benchaib, Alexis Marcano, Santiago Torres-Alegre, Diego Andina
  - "SBRS: bridging the gap between biomedical research and clinical practice" *Santiago Timón Reina, Rafael Martinez Tomas, Mariano Rincon Zamorano, Tomás Garcia-Saiz, Estela Díaz-López, Rosa Mª Molina Ruíz*
  - "Perceptual analysis of speech signals from people with Parkinson's disease" *Juan Orozco-Arroyave, Julián David Arias-Londoño, Jesús Francisco Vargas Bonilla, Elmar Nöth*
  - "Characterization of Speech from Amyotrophic Lateral Sclerosis by Neuromorphic Processing"
    Pedro Gómez-Vilda, José Manuel Ferrandez, Victoria Rodellar

- Session: Cognitive Robotics II June, 13. 11:30–13:30 Room: B
  "**Cognitive Robotics**"
  Organizer & Chair: Javier de Lope Asiaín
  Co-Chair: Darío Maravall Gómez-Allende

  - "A Vision-based dual Anticipatory/Reactive control Architecture for Indoor Navigation of an UAV"
    Dario Maravall, Javier de Lope, Juan Pablo Fuentes Brea
  - "Alignment in Vision-oriented Syntactic Language Games for Teams of Robots using Stochastic Regular..."
    Jack Mario Mingo, Dario Maravall, Javier de Lope
  - "A preliminary auditory subsystem based on a Growing Functional Modules Controller"
    Jerome Leboeuf, Gabriel Fatíh Gómez Ávila, José Eduardo González Pacheco Oceguera
  - "Robust multi-sensor system for mobile robot localization"
    Adrián Canedo-Rodríguez, Víctor Álvarez-Santos, David Álvarez-Santos, Cristina Gamallo Solórzano, Manuel Fernández Delgado, Roberto Iglesias, Carlos V. Regueiro

- "Implicit and Robust Evaluation Methodology for the Evolutionary Design of Feasible Robots"
  Andres Faina, Felix Orjales, Francisco Bellas, Richard Duro
- "Route learning and reproduction in a tour-guide robot"
  Víctor Álvarez-Santos, Adrián Canedo-Rodríguez, Roberto Iglesias, Xose Manuel Pardo, Carlos Vazquez Regueiro

- Session: Smart Spaces II June, 13. 11:30–13:30 Room: C
  "**Smart Spaces for Health, Safety and Well-being**"
  Organizer & Chair: Rafael Martínez Tomás
  Co-Chair: Antonio Fernández-Caballero

  - "People Detection in Color and Infrared Video using HOG and Linear SVM" *Pablo Tribaldos, Juan Serrano-Cuerda, María T. López, Antonio Fernández-Caballero, Roberto Lopez-Sastre*
  - "Smart Spaces and Monitoring Simulation" *Coral García-Rodríguez, Rafael Martinez Tomas, Jose Manuel Cuadra Troncoso*
  - "Experimental study of the Stress level at the Workplace using an Smart Testbed of WSN and AmI Techni..." *Fabio Silva, Teresa Olivares, Fernando Royo, Miguel A. Vergara, Cesar Analide*
  - "Towards Usability Evaluation of Multimodal Assistive Technologies using RGB-D Sensors" *José Alberto Fuentes, Miguel Oliver, Francisco Montero, Antonio Fernández-Caballero, Miguel Fernandez*
  - "Fusion of Overhead and Lateral View Video for Enhanced People Counting" *Juan Serrano-Cuerda, Marina Sokolova, Antonio Fernández-Caballero, María T. López, José C. Castillo*
  - "Self organised biogegraphy algorithm for clustering" *Leïla Hamdad, Anissa Achab, Amira Boutouchent, Fodil Dahamni, Karima Benatchba*

Other Technical Sessions

June 11, Tuesday

16:40–18:00 h. *Room B*: (meeting for Ibero-American researchers)
Reunión Red CYTED sobre Computación Natural y Artificial para la Salud (CANS research network).

Social Program

Coffee breaks only days June 11, 12 and 13, from 11:00 to 11:30 h.

Lunches only days June 11 and 12, for registered participants and accompanying persons (with lunch ticket). Served at 14:00 h. *in the Congress Venue.*

June 11, Tuesday

20:00 h. – Welcome reception and cocktail at the Congress Venue.

June 13, Wednesday

18:30 h. – Depart of buses to Palma de Mallorca, where we will take the Sóller Train (antique style train) for a tour across Mallorca with nice views. In Sóller we will take a tram to *Restaurant Es Canyis,* in Puerto de Sóller, for the congress **official dinner** (casual wear).

Internet connection

During the conference venue 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 fulfilled with the Conference Technical Secretariat, ESOC (please, see the address bellow), 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 (*)	€500	€600
Session Organizer (*)	€400	€500
Accompanying Person A (**)	€175	€175
Accompanying Person B (**)	€100	€100
2nd paper and each one more	€300	€350

(*) Includes coffee breaks, meals, social events (welcome reception cocktail, Sóller train tour and official dinner), and the "Lecture Notes in Computer Science" books (Springer-Verlag) of the work-conference proceedings.

(**) Includes social events (welcome reception cocktail, Sóller train tour and official dinner). Type A registration also includes meals.

Technical Secretariat of the Conference

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

ESOC, s.l.
Calle Río Duero, 30, Local 10
E-03690 San vicente del Raspeig
Alicante (Spain)
Phone: `(+34) 965-22-99-40` Fax: `(+34) 965-92-23-46`
E-mail: `secretariat@grupoesoc.es`

Since 17:00 h. June 10, 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.congresosesoc.com/IWINAC2013/`).

Congress URL `http://www.iwinac.org/iwinac2013/`

General Information

Congress venue

Son Caliu Hotel Spa-Oasis
Avenida Son Caliu, 8
E-07181, Palma Nova
Mallorca (Balearic Islands), Spain

* Special reduced prices for accommodation in the hotel and near it through our Technical Secretariat (see contact in the previous page).

Travel Information

Palma de Mallorca airport (international code "PMI") with flights mainly from Spain and Europe, is located at 26 km far away from Congress venue. Taxi rates from airport to the congress venue hotel are around 35 euros. In the airport there are shuttle bus and shared ride that can be cheaper. There are also public buses to Palma de Mallorca and from there to the congress venue hotel (in Palma Nova and near Magaluf).
Also, it is possible to go to Palma de Mallorca (at 15 km from Congress venue) by ferry boat from Barcelona or Valencia (both in mainland Spain).
Please, contact our Technical Secretariat (ESOC) for a more detailed information on travel and accommodation.

Language

English will be the official language of IWINAC2013. Simultaneous translation will *not* be provided.

Climate

Mallorca (Majorca) island is located at about 39° 37' N and 2° 59' E. It is the largest island in the Balearic Islands archipelago in Spain. The Congress Venue is near the coast to the Mediterranean Sea in the south-west part of the island (Bay of Palma). The island has sunny and warm moderate climate in June. The temperature in June can vary from 22-26°C by day to 18-22°C by night. The water temperature is around 19.5°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 travelers checks.

Currency

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

Tipping

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

Electricity

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

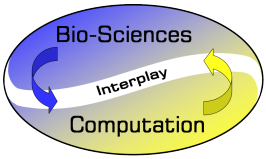
Assistance and insurance

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, tourism, visits, etc.) about Mallorca Island through the web pages:

- `http://en.wikipedia.org/wiki/Majorca`
- `http://www.illesbalears.es/ing/majorca/home.jsp`
- `http://www.mallorcaweb.com/eng/`
- `http://www.majorca-mallorca.co.uk/`
- `http://www.trendesoller.com/en/cms.php`



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Congress Venue:
Son Caliu Hotel Spa-Oasis, Palma Nova, Mallorca (Spain)
June 10–14, 2013
`http://www.iwinac.org/iwinac2013/`

Personal Agents for managing social notifications in an e-learning environment

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Abstract
This paper presents a Smart Routing Architecture that mediates between teachers and students. The paper discusses the benefits and disadvantages of using Instant Messaging in an e-Learning environment. Based on that, it defines the requirements and proposes a functional architecture that fulfils them. The architecture has been implemented and tested within an e-Learning environment in order to evaluate the interruption impact and its effect over productivity.

1 Introduction

Instant Messaging (IM) is a communication technology that is increasingly being used for interpersonal communication. A recent study showed that 97% of university students are IM users [1]. Some studies [2,3] have shown that the usage of instant messaging can enhance the learning process considerably, especially in students with active learning characteristics [4]. IM offers benefits, such as providing social presence for distance students [5], and enhancing school work by providing a new environment for collaboration [6].

Nevertheless, this communication can bring other drawbacks. University students may be distracted by IM [6] from fulfilling scholarly tasks. Given that learning is a highly focused task, another potential problem is that the cost of the interruption can be high [7], and may lead to losses in productivity [8]. Several works have addressed the problem of how the interruption can be managed in order to minimise their effect while executing a primary task –e.g. studying a subject.

Yet another potential problem is the social accessibility [6], since IM increases people's reach into private time. Given that IM's status is currently a single property, and it cannot be changed depending on the target set of acquaintances, both professors as students can be reluctant to share their status [3,6].

2 Smart Assistant Mediator

In this paper we aim to propose an intelligent architecture for one specific usage of IM in the learning process: finding an immediate answer to a question.

Functional Requirements

We have identified a list of major requirements for an e-learning scenario. The system should improve learners' ability to immediately solve doubts without overloading teachers –what would be unacceptable. Thus, it must be able to automatically process a significant number of the questions and effectively reduce teachers overload. The system should allow teachers deciding when they want to be contacted, and for sake of privacy, it should not reveal their status. It will manage productivity by reducing undesired interruptions and will provide a suitable time management mechanism. Finally, given that university courses are usually taught by several teachers, the system should distribute the conversations according to the competences of the teachers and their availability.

Functional Architecture

The Smart Assistant Mediator (SMA) is an agent-based intelligent module for managing communications. Based on the requirements identified above, the design follows the mediator design pattern. In this way, communications are manager through the SMA acting as intermediary -concealment and disclosure requirements are met.

Four entities take part: a student that asks questions, the SMA that provides the business logic of the module, chatter-bot system for automatically process the question in natural language, and teachers that process the question as a backup option.

First, the student should contact the SMA, which she must have already added to her contact list. Then, the SMA should process the incoming communication, which could be carried out using a wide range of communication protocols (e.g. XMPP or SIP/SIMPLE). Next, the SMA determines whether this incoming message is part of an existing ongoing session, in order to route to that conversation. Otherwise, the message is sent to a chatter-bot, that process it and returns the answer. It is annotated with a confidence factor about the quality of the answer. It measures the certainty the question has been correctly un-

derstood. The system, based on the student's feedback also measures the utility factor that is used, in conjunctions with the confidence factor, to determine the quality of the answer. In case the quality is not good enough, SMA determines whether there is an available teacher with capability to answer the question and selects one. Then, SMA determines which is the most suitable moment to send the question in order to minimize the interruption impact. Next, SMA sends the question to the teacher. The teacher sends her answer and optionally adds that answer to the bot knowledge base. Finally, SMA sends the answer –the bot's or the teacher's– to the student.

3 Case Study

We developed a sample use case from the e-learning domain to demonstrate the feasibility of our approach based on the functional requirements mentioned before. The presented case is focused on the e-learning environment with students in programming course that may require help at any time. The scenario consists of several actors: students, teachers, a bot programming expert and one SMA as a mediator that conducts the communication process.

Fig. 1. Use case interface provided to the Student. He is being assisted by the Bot.

Students can talk to the SMA directly through the IM client. As seen in Figure 1, when the bot is able to process the question, the answer is given automatically. The SMA has receives the feedback and it learns whether given solution is helpful or not. When a student asks a question that the bot cannot answer (giving an appropriate solution), the SMA looks for a suitable and available teacher to redirect the conversation with the student. The teacher is inform about the incoming conversation, and after a positive authorization, they can talk through chat.

4 Conclusions

We have proposed a functional architecture that integrates Agent Technology and follows the mediator design pattern. The mediator agent adds value to the intermediation process, it reduces interruption -thus increases productivity- and preserves privacy. Inclusion of a bot system significantly reduces the overload of messages processed by teachers, since students' doubts are usually the same so they only need to be answered once.

The use case shown presents some difficulties in the way it can be evaluated. Determining when a teacher or student is interrupted is a whole issue, and requires a great deal of research. Neuroscience can fulfil this gap, and provide a different perspective on interruption detection and determine the impact on the productivity it may cause. Within this inputs, the SMA may determine when to interrupt, and anticipate its effects over productivity.

Acknowledgement

This work is funded by the European Commission under R&D project OMELETE (FP7-ICT-2009-5), Spanish Ministry of Industry, Tourism and Trade through the project Web 4.0 (TSI-020100-2010-792) and, Spanish Ministry of Economy and Competitiveness through the project Calista (TEC2012-32457).

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