

IWINAC2022

9th INTERNATIONAL WORK-CONFERENCE ON THE INTERPLAY BETWEEN NATURAL AND ARTIFICIAL COMPUTATION

FULL PROGRAM

Puerto de la Cruz, Tenerife, Spain.

May 31 – June 3, 2022

Organized by

Universidad Nacional de Educación a Distancia (UNED)

Universidad Politécnica de Cartagena

in cooperation with

Universidad de La Laguna

Universidad Politécnica de Madrid



<http://www.iwinac.org/iwinac2022/>

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Acknowledgments

IWINAC2022 still owes too much to our friend Prof. Mira. As a pioneer in the field of Cybernetics, he enthusiastically promoted and organized the first editions of these interdisciplinary meetings. We still miss him and we want to dedicate IWINAC2022 in memoriam to Prof. Mira.

IWINAC2022 has been organized by Universidad Nacional de Educación a Distancia (UNED) and Universidad Politécnica de Cartagena (UPCT) in cooperation with Universidad de La Laguna and UNED-Tenerife Associated Center.

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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 in both directions, from Computation to Sciences of Natural, and vice versa, 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.

Conference Organization

General Chair

JOSÉ MANUEL FERRÁNDEZ VICENTE *Universidad Politécnica de Cartagena (Spain)*

Organizing Committee

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CAROLINA JORGE TRUJILLO *Universidad de La Laguna (Spain)*

CHAXIRAXI DÍAZ CABRERA *Universidad de La Laguna (Spain)*

Invited Speakers

HOJJAT ADELI	<i>Ohio State University (USA)</i>
RAFAEL REBOLO	<i>Instituto de Astrofísica de Canarias (Spain)</i>
ATHANASIOS TSANAS	<i>University of Edinburgh (UK)</i>
MANUEL DE VEGA	<i>Universidad de La Laguna (Spain)</i>
LUIS M. SARRO	<i>Universidad Nacional de Educación a Distancia (Spain)</i>

Field Editors

Jesús Bernardino Alonso	<i>Universidad de Las Palmas de Gran Canaria (Spain)</i>
Emilia Barakova	<i>Eindhoven University of Technology (The Netherlands)</i>
Diego Castillo-Barnes	<i>Universidad de Granada (Spain)</i>
Enrique Dominguez	<i>Universidad de Málaga (Spain)</i>
Francisco Domínguez-Mateos	<i>Universidad Rey Juan Carlos (Spain)</i>
Josefa Dorta Luis	<i>Universidad de La Laguna (Spain)</i>
Jose García-Rodríguez	<i>Universitat d'Alacant (Spain)</i>
Andrés Gómez-Rodellar	<i>University of Edinburgh (UK)</i>
Pedro Gómez-Vilda	<i>Universidad Politécnica de Madrid (Spain)</i>
Juan Manuel Górriz	<i>Universidad de Granada (Spain)</i>
Victoria Marrero Aguiar	<i>Universidad Nacional de Educación a Distancia (Spain)</i>
Carmen Jiménez Mesa	<i>Universidad de Granada (Spain)</i>
Vicente Julián-Inglada	<i>Universitat Politècnica de València (Spain)</i>
Carolina Jorge	<i>Universidad de La Laguna (Spain)</i>
Krzysztof Kutt	<i>Jagiellonian University (Poland)</i>
Fco. Jesús Martínez Murcia	<i>Universidad de Málaga (Spain)</i>
Rafael Martínez Tomás	<i>Universidad Nacional de Educación a Distancia (Spain)</i>
Jiri Mekyska	<i>Brno University of Technology (Czech Republic)</i>
Ramón Moreno	<i>Grupo Antolin (Spain)</i>
Grzegorz J. Nalepa	<i>Jagiellonian University (Poland)</i>
Andrés Ortiz	<i>Universidad de Málaga (Spain)</i>
Daniel Palacios-Alonso	<i>Universidad Rey Juan Carlos (Spain)</i>
José T. Palma	<i>Universidad de Murcia (Spain)</i>
Javier Ramírez	<i>Universidad de Granada (Spain)</i>
Mariano Rincón Zamorano	<i>Universidad Nacional de Educación a Distancia (Spain)</i>
Victoria Rodellar	<i>Universidad Politécnica de Madrid (Spain)</i>
Jose Santos Reyes	<i>Universidade da Coruña (Spain)</i>
Fermín Segovia	<i>Universidad de Granada (Spain)</i>
Athanasios Tsanas	<i>University of Edinburgh (UK)</i>
Ramiro Varela	<i>Universidad de Oviedo (Spain)</i>
Yu-Dong Zhang	<i>University of Leicester (UK)</i>

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Ramiro Varela Arias, Spain
Hujun Yin, UK
Yu-Dong Zhang, UK

Program Outline. Detailed session contents and social events in pages 8 – 21.

Tuesday May 31	
morning	<i>free time</i>
17:00–20:00	<i>Registration at Technical Secretariat desk</i>

Wednesday June 1			
08:30–09:00	<i>Opening Ceremony</i>		
09:00–10:00	<i>Plenary Session I: Prof. Rafael Rebolo</i>		
10:00–11:00	<i>Plenary Session II: Prof. Hojjat Adeli</i>		
11:00–11:20	<i>coffee break</i>		
	Room A:	Room B:	Room C:
11:20–12:40	<i>NeurDis-ENMF</i>	<i>AfCAI-I</i>	<i>DeepLearn-I</i>
12:40–14:00	<i>NeurDis-AGNDR</i>	<i>AfCAI-II</i>	<i>DeepLearn-II</i>
14:00–15:30	<i>lunch</i>		
15:30–16:30	<i>Posters attendance with stand-up coffee</i>		
16:00–17:20	<i>NeurDis-ASD</i>	<i>Biomedical-I</i>	<i>IA-Apps-I</i>
17:20–18:00		<i>free rooms</i>	
18:00–19:00	<i>Music & Light Synesthesia event</i>		
19:00–20:00	<i>free time</i>		
20:00–	<i>Welcome Reception and Cocktail</i>		

Thursday June 2			
09:00–10:00	<i>Plenary Session III: Prof. Manuel de Vega</i>		
10:00–11:00	<i>Plenary Session IV: Prof. Athanasios Tsanas</i>		
11:00–11:20	<i>coffee break</i>		
	Room A:	Room B:	Room C:
11:20–12:40	<i>MALENE-I</i>	<i>NeurDis-CNL</i>	<i>Emotions</i>
12:40–14:00	<i>MALENE-II</i>	<i>NeurDis-PMA</i>	<i>Robotics</i>
14:00–15:30	<i>lunch</i>		
15:30–16:30	<i>MALENE-III</i>	<i>MLCVR-I</i>	<i>IS4ATAMCI-I</i>
16:30–17:20	<i>MALENE-IV</i>	<i>MLCVR-II</i>	<i>IS4ATAMCI-II</i>
17:20–18:00	<i>free time</i>		
18:00–	<i>Sightseeing excursion & Official Dinner</i>		

Friday June 3			
09:00–10:00	<i>Plenary Session V: Prof. Luis M. Sarro</i>		
	Room A:	Room B:	Room C:
10:00–11:00	<i>MALENE-V</i>	<i>MLCVR-III</i>	<i>BICA-I</i>
11:00–11:20	<i>coffee break</i>		
11:20–12:40	<i>IA-Apps-II</i>	<i>Biomedical-II</i>	<i>BICA-II</i>
12:40–13:00	<i>Closing Ceremony</i>		
afternoon	<i>free time</i>		

- Session: Plenary-I June, 1. 09:00—10:00 Room: A
“Invited speaker: Prof. Rafael Rebolo”

- Session: Plenary-II June, 1. 10:00—11:00 Room: A
“Invited speaker: Prof. Hojjat Adeli”

- Session: NeurDis-ENMF June, 1. 11:20—12:40 Room: A
“NeurDis workshop: Evaluation of Neuromotor Functions”
Chair: Agustín Álvarez-Marquina Co-Chair: Pedro Gómez Vilda

 - “Monitoring motor symptoms in Parkinson’s disease under long term acoustic stimulation” *Guillermo de Arcas Castro, Luis Sigcha, David Gonzalez, Ignacio Pavon, Juan Manuel Lopez*
 - “Evaluation of TMS Effects on the Phonation of Parkinson’s Disease Patients” *Andrés Gómez-Rodellar, Pedro Gomez Vilda, Jiri Mekyska, Lubos Brabenec, Patrik Simko, Irena Rektorova*
 - “Effects of Neuroacoustic Stimulation on Two Study Cases of Parkinson’s Disease Dysarthria” *Pedro Gomez Vilda, Andrés Gómez-Rodellar, Daniel Palacios-Alonso, Agustín Álvarez-Marquina*
 - “Characterizing Masseter Surface Electromyography on EEG-related Frequency Bands in Parkinson’s Disease Neuromotor Dysarthria” *Andrés Gómez-Rodellar, Pedro Gomez Vilda, José Manuel Ferrandez, Athanasios Tsanas*

- Session: AfCAI-I June, 1. 11:20—12:40 Room: B
“Workshop on Affective Computing and Context Awareness in Ambient Intelligence - I”
Chair: Grzegorz J. Nalepa Co-Chair: José Palma

 - “Eye tracking measurement of train drivers’ attention based on quasi-static areas of interest” *Paweł Węgrzyn, Michal Kepski, Iwona Grabska-Gradzińska*
 - “A physical cognitive assistant for monitoring hand gestures exercises” *Jaime Andres Rincon Arango, Vicente Javier Julian Inglada, Carlos Carrascosa Casamayor*
 - “Automation of Social Media Interactions: A Framework for Online Social “Sowing”” *Francisco Marcondes, Paulo Novais, José Almeida*
 - “Visualization Methods for Exploratory Subgroup Discovery on Time Series Data” *Dan Hudson, Martin Atzmueller, Travis Wiltshire*

- Session: **DeepLearn-I** June, 1. 11:20—12:40 Room: C
 Chair: Manuel Graña Co-Chair: Álvaro Barreiro

 - “Data augmentation techniques for speech emotion recognition and deep learning”
Javier de Lope, Manuel Graña, José Antonio Nicolás
 - “Deep Learning artwork style prediction and similarity detection”
Manuel Graña, Igor Sorraín Rebollar
 - “Handwritten word recognition on the Fundación-Osborne dataset”
Álvaro Barreiro, Victoria Ruiz, Angel Sanchez, Jose Velez
 - “Automatic Annotation for Weakly Supervised Pedestrian Detection”
Francisco José Garcia-Espinosa, Antonio Sanz, Alfredo Cuesta-Infante

- Session: NeurDis-AGNDR June, 1. 12:40—14:00 Room: A
“NeurDis workshop: Advanced Gaming in Neurodegenerative Disease Rehabilitation”
 Chair: Daniel Palacios-Alonso Co-Chair: Andrés Gómez-Rodellar

 - “Acquisition of Relevant Hand-Wrist Features Using Leap Motion Controller: A Case of Study”
Agustín Álvarez-Marquina, Pedro Gomez Vilda, Daniel Palacios-Alonso, Carlos Rodrigo-Rivero, Carlos Garre del Olmo, Francisco Domínguez-Mateos
 - “A pilot and feasibility study of virtual reality as gamified monitoring tool for neurorehabilitation”
Daniel Palacios-Alonso, Andrés Gómez-Rodellar, José Manuel Ferrandez, Pedro Gomez Vilda, Agustín López-Arribas, Guillermo Meléndez-Morales, Esther Núñez-Vidal
 - “Pairing of visual and auditory stimuli: a study in musicians on the multisensory processing of the dimensions of articulation and coherence”
Octavio de Juan-Ayala, Vicente Caruana, José Javier Campos-Bueno, Jose Manuel Ferrández, Eduardo Fernández
 - “Design of Educational Scenarios with BigFoot Walking Robot: A Cyber-physical System Perspective to Pedagogical Rehabilitation”
Maya Dimitrova, Valentin Nikolov, Ivan Chavdarov, Aleksandar Krastev, Hiroaki Wagatsuma

- Session: AfCAI-II June, 1. 12:40—14:00 Room: B
“Workshop on Affective Computing and Context Awareness in Ambient Intelligence - II”

Chair: Vicente Julián Inglada

Co-Chair: Krzysztof Kutt

- “Real-life validation of emotion detection system with wearables”
Dominika Kunc, Stanislaw Saganowski, Joanna Komoszyńska, Bartosz Perz, Przemysław Kazienko
- “Sentiment Analysis Based on Smart Human Mobility: a comparative study of ML models”
Luís Rosa, Cesar Analide, Fábio Silva
- “Evaluation of Selected APIs for Emotion Recognition from Facial Expressions”
Krzysztof Kutt, Grzegorz J. Nalepa, Piotr Sobczyk

- Session: **DeepLearn-II** June, 1. 12:40—14:00 Room: C
 Chair: Guido Bologna Co-Chair: José Luis Sancho

- “Explaining CNN Classifications by Propositional Rules Generated from DCT Feature Maps”
Guido Bologna
- “Non-analytical Reasoning Assisted Deep Reinforcement Learning”
John Schonefeld, Md Karim
- “Double-layer Stacked Denoising Autoencoders for Regression”
María Elena Fernández-García, Antonio Ros Ros, Aníbal R. Figueiras, Jose Luis Sancho-Gomez, Eloy Hontoria Hernández

- Session: Posters June, 1. 15:30—16:30 Room: P
“Posters attendance with stand-up coffee”

Chair: José Manuel Ferrández

Co-Chair: Maria Bonomini

1. “Evaluation of a Gaussian Mixture Model for generating synthetic ECG signals during an angioplasty procedure”
Anderson Rincon Soler, Maria Bonomini, Pedro D. Arini, Santiago Caracciolo, Fernando Ingallina
2. “Automatic left bundle branch block diagnose using a 2-D convolutional network”
Axel César Wood Niella, Maria Bonomini, Juan Marcos Cerrato Brown
3. “QRS-T angle as a biomarker for LBBB strict diagnose”
José Manuel Ferrández, Maria Bonomini, Beatriz del Cisne Macas Ordoñez
4. “Variable embedding based on L-statistic for electrocardiographic signal analysis”
Lucas Escobar, Edilson Delgado-Trejos, Juan Murillo, David Cuesta

5. “Uniform and non-uniform embedding quality using electrocardiographic signals”
Juan Pablo Restrepo Uribe, Edilson Delgado-Trejos, David Cuesta, Diana Orrego-Metaute
6. “Decoding Lower-Limbs Kinematics from EEG Signals”
Javier V. Juan, Eduardo Iáñez, Mario Ortiz, Laura Ferrero, José M. Azorín, Luis de la Ossa
7. “EEG Signals in mental fatigue detection: A comparing study of machine learning technics VS deep learning”
Halima Ettahiri, José Manuel Ferrandez, Taoufiq Fechtali
8. “Application of RESNET and Combined RESNET+LSTM Network for Retina Inspired Emotional Face recognition System”
Mahmudul Huq, Francisco Javier Garrigos Guerrero, Jose Javier Martinez-Alvarez, José Manuel Ferrandez, Eduardo Fernandez
9. “Deep Layout Extraction applied to Historical Postcards”
Ana Belen Moreno Diaz, Jose Velez, Angel Sanchez, Bruno Garcia
10. “Detection of Unknown Defects in Semiconductor Materials From a Hybrid Deep and Machine Learning Approach”
Francisco López de la Rosa, Rafael Morales, Antonio Fernández-Caballero, José L. Gómez-Sirvent, Corinna Kofler
11. “Using temporal information in deep learning architectures to improve lane detection under adverse situations”
Mariano Rincon Zamorano, Diego Turrado, Jan Koloda
12. “Improvement of Fixation Elements Detection in Aircraft Manufacturing”
Francisco Cavas, Leandro Ruiz, Sebastián Díaz, José M. González
13. “A new artificial intelligence approach for the radiographic classification of Sacroiliitis”
Esther Fernandez, Javier Garrigos, Jose Javier Martinez, Irene Cases, Manuel Jose Moreno, Luis Francisco Linares, Angel García, Jose Manuel Ferrandez, Eduardo Fernández
14. “Deep Reinforcement Learning in Agents’ Training: Unity ML-Agents”
Laura Almón-Manzano, José Manuel Cuadra Troncoso, Rafael Pastor-Vargas
15. “Clustering of COVID-19 time series incidence intensity in Andalusia, Spain”
Miguel Díaz Lozano, Pedro Antonio Gutierrez, Cesar Hervás Martinez, David Guijo Rubio
16. “Triage prediction of a real dataset of COVID-19 patients in Alava”
Goizalde Badiola, José Manuel López Guede, Julian Estevez, Manuel Graña

17. “Vision-Based Human Posture Detection from a Virtual Home-Care Unmanned Aerial Vehicle”
Lidia Belmonte, Pascual González, Antonio Fernández-Caballero, Rafael Morales, Andrés Bustamante, Antonio Pereira
18. “Development and validation of a novel technology for postural analysis and human kinematics”
Cristina Soto-Sánchez, Eduardo Fernandez, Rocío López Peco, Roberto Morollón Ruiz
19. “Multi-Agent LoRaWAN Network for End-of-Life Management of Electric Vehicle Batteries”
Celia Garrido-Hidalgo, Luis Roda-Sanchez, Teresa Olivares, Antonio Fernández-Caballero, F. Javier Ramirez
20. “Spatial frames of reference and action: a study with evolved neuroagents”
Michela Ponticorvo, Nicola Milano
21. “Multi-Agent Systems in support of Digital Twins: a Survey”
Elena Pretel, Elena Navarro, Víctor López-Jaquero, Alejandro Moya, Pascual González
22. “Automatic Selection of Financial Ratios by Means of Differential Evolution and for Predicting Business Insolvency”
José Santos Reyes, Ángel Beade, Óscar Sestayo, Manuel Rodríguez
23. “Feature ranking for feature sorting and feature selection: FR4(FS)²”
Antonio J. Tallón-Ballesteros, Paola Santana Morales, Alberto F. Merchán, Alba Márquez Rodríguez
24. “A computational drug repositioning method for rare diseases”
Belén Otero Carrasco, Lucía Prieto Santamaría, Esther Ugarte Carro, Juan Pedro Caraça-Valente Hernández, Alejandro Rodríguez González
25. “Doughnut Computing in City Planning for Achieving Human and Planetary Rights”
Juan José Moreno-Navarro, Veronica Dahl
26. “Temperature control and monitoring system for electrical power transformers using thermal imaging”
Fermin Segovia, Javier Ramirez, Diego Salas-Gonzalez, Ignacio Alvarez Illan, Francisco Jesus Martínez-Murcia, Juan M Gorriz, Jacob Rodriguez-Rivero, Francisco J. Leiva, Carlos Gaitan
27. “Visual parking space estimation using detection networks and rule-based systems”
Susana Pineda De Luermo, Antonio Sanz, Juan Pantrigo, Elena Giraldo Del Viejo
28. “Statistical and Symbolic Neuroaesthetics Rules Extraction From EEG Signals”
Guido Sciavicco, Giovanni Pagliarini, Federico Manzella, Sante Mazzacane, Maddalena Coccagna

- Session: **NeurDis-ASD** June, 1. 16:30—18:00 Room: A
“NeurDis workshop: Autism Spectrum and related Disorders”
Chair: Emilia I. Barakova Co-Chair: Victoria Rodellar

 - “Feasibility study of a ML-Based ASD monitoring system”
José María Vicente Samper, Jose M Sabater-Navarro, Ernesto Ávila Navarro
 - “ApEn: A stress-aware pen for children with Autism Spectrum Disorder”
Jing Li, Emilia I. Barakova, Jun Hu, Martine van Dongen-Boomsma, Wouter Staal
 - “Anxiety Monitoring in Autistic Disabled People During Voice Recording Sessions”
Victoria Rodellar, Marina Jodra, Paula Maestro
 - “What can Technology do for Autistic Spectrum Disorder People?”
Marina Jodra, Victoria Rodellar
 - “Autism Spectrum Disorder (ASD): emotional intervention protocol”
Gema Benedicto Rodríguez, Eduardo Fernandez, Francisco Sánchez-Ferrer, José Manuel Ferrandez, Mikel Val-Calvo
 - “Creating vignettes for a Robot-Supported Education Solution for Children with Autism Spectrum Disorder”
Trenton Schulz, Kristin Skeide Fuglerud

- Session: **Biomedical-I** June, 1. 16:30—17:20 Room: B
Chair: Eduardo Fernández Co-Chair: Mikel Val-Calvo

 - “Analysis of the asymmetry in RNFL thickness using Spectralis OCT measurements in healthy and glaucoma patients”
Rafael Berenguer-Vidal, Rafael Verdú-Monedero, Juan Morales Sanchez, Inmaculada Sellés-Navarro, Oleksandr Kovalyk
 - “Performance evaluation of a real-time phase estimation algorithm applied to intracortical signals from human visual cortex”
Fabrizio Grani, Cristina Soto-Sánchez, Maria Dolores Grima-Murcia, Mikel Val-Calvo, José Manuel Ferrandez, Eduardo Fernandez, Alfonso Rodil Doblado, Fernando Farfan, Leili Soo, Dorota Waclawczyk, Pablo González, Maria Dolores Coves, Arantxa Alfaro
 - “Electrical Stimulation Induced Current Distribution in Peripheral Nerves Varies Significantly with the Extent of Nerve Damage: A Computational Study Utilizing Convolutional Neural Network and Realistic Nerve Models”
Jinze Du, Eduardo Fernandez, Andres Morales, Pragma Kosta, Jean-Marie C. Bouteiller, Gema Martínez, David Warren, Gianluca Lazzi

- Session: **IA-Apps-I** June, 1. 16:30—17:20 Room: C
 Chair: Mario J. Perez Jimenez Co-Chair: Luis Eduardo Imbernón Cuadrado
 - “Basic arithmetic calculations through vrius-based machines”
Antonio Ramírez de Arellano, Mario J. Perez Jimenez, David Orellana-Martín
 - “An efficient and rotation invariant Fourier-based metric for assessing the quality of images created by generative models”
José Manuel Cuadra Troncoso, Mariano Rincon Zamorano, Javier Gamazo Tejero
 - “A first-in-class block-based programming language distance calculation”
Luis Eduardo Imbernón Cuadrado, Ángeles Manjarrés, Félix de la Paz López

- Session: Plenary-III June, 2. 09:00—10:00 Room: A
“Invited speaker: Prof. Manuel de Vega”
- Session: Plenary-IV June, 2. 10:00—11:00 Room: A
“Invited speaker: Prof. Athanasios Tsanas”
- Session: MALENE-I June, 2. 11:20—12:40 Room: A
“Workshop on Machine Learning in Neuroscience - I”
 Chair: Juan M. Gorriz Co-Chair: Yu-Dong Zhang
 - “ConvNet-CA: A Lightweight Attention-Based CNN for Brain Disease Detection”
Juan M Gorriz, Yu-Dong Zhang, Hengde Zhu, Jian Wang, Shui-Hua Wang
 - “Temporal phase synchrony disruption in Dyslexia: anomaly patterns in auditoryprocessing”
Marco A. Formoso, Andres Ortiz García
 - “CAD system for Parkinson’s Disease with penalization of non-significant or high-variability input data sources”
Diego Castillo-Barnes, Javier Merino-Chica, Raúl Díaz-García, Carmen Jimenez-Mesa, Juan Eloy Arco, Javier Ramirez, Juan M Gorriz
 - “Automatic classification system for diagnosis of cognitive impairment based on the clock-drawing test”
Carmen Jimenez-Mesa, Juan Eloy Arco, Andres Ortiz García, Diego Castillo-Barnes, Javier Ramirez, Juan M Gorriz, Meritzel Valentí-Soler, Belén Frades-Payo, María Ascensión Zea-Sevilla, Marina Ávila-Villanueva, Teodoro Del Ser Quijano, Cristóbal Carnero-Pardo

- Session: NeurDis-CNL June, 2. 11:20—12:40 Room: B
“NeurDis workshop: Clinical Neurolinguistics”
 Chair: Pedro Gómez Vilda Co-Chair: Daniel Palacios-Alonso

 - “Identification of Parkinson’s Disease from Speech using CNNs and Formant Measures”
Agustín Álvarez-Marquina, Daniel Palacios-Alonso, Andrés Gómez-Rodellar, Francisco Díaz-Pérez, Pedro Gomez Vilda
 - “Characterization of Hypokinetic Dysarthria using a Convolutional Neural Network based on Auditory Receptive Fields”
Pedro Gomez Vilda, Andrés Gómez-Rodellar, Daniel Palacios-Alonso, Agustín Álvarez-Marquina, Athanasios Tsanas
 - “Evaluation of the presence of subharmonics in the phonation of children with Smith Magenis Syndrome”
Daniel Palacios-Alonso, Rafael Martínez-Olalla, Irene Hidalgo-delaGuía, Elena Garayzabal-Heinze, Pedro Gomez Vilda
 - “Speech Analysis in Preclinical Identification of Alzheimer’s Disease”
Olga Ivanova, Juan José G. Meilán

- Session: **Emotions** June, 2. 11:20—12:40 Room: C
 Chair: Antonio Fernández-Caballero Co-Chair: Pascual González

 - “Influence of the Level of Immersion in Emotion Recognition Using Virtual Humans”
Antonio Fernández-Caballero, José Pascual Molina, Pascual González, Arturo S. García, Miguel A. Vicente-Querol, Luz M. González-Gualda, Patricia Fernández-Sotos
 - “Influence of Neutral Stimuli on Brain Activity Baseline in Emotional Experiments”
Beatriz García-Martínez, Antonio Fernández-Caballero
 - “Classification of Psychophysiological Patterns During Emotional Processing Using SVM”
Andres Quintero-Zea, Natalia Trujillo, Jose Lopez Hincapie, Juan Martínez-Vargas, Diana Gómez
 - “Measuring motion sickness through racing simulator based on virtual reality”
Daniel Palacios-Alonso, Javier Barbas-Cubero, Luis Betancourt-Ortega, Mario Fernández-Fernández

- Session: MALENE-II June, 2. 12:40—14:00 Room: A
“Workshop on Machine Learning in Neuroscience - II”
 Chair: Andres Ortiz García Co-Chair: Javier Ramirez

 - “Unraveling dyslexia-related connectivity patterns in EEG signals by Holo-Hilbert Spectral analysis” *Nicolás J. Gallego-Molina, Andres Ortiz García, Francisco Jesus Martínez-Murcia, Ignacio Rodriguez-Rodriguez*
 - “Inter-channel Granger causality for estimating EEG phase connectivity patterns in dyslexia” *Ignacio Rodriguez-Rodriguez, Andres Ortiz García, Marco A. Formoso, Nicolás J. Gallego-Molina, Juan Luis Luque*
 - “Automatic Diagnosis of Schizophrenia in EEG signals Using Functional Connectivity Features and CNN-LSTM Model” *Afshin Shoeibi, Juan M Gorriz, Mitra Rezaei, Navid Ghassemi, Zahra Namadchian, Assef Zare*
 - “Sleep apnea diagnosis using complexity features of EEG signals” *Afshin Shoeibi, Juan M Gorriz, Behnam Gholami, Mohammad Hossein Behboudi, Ali Khadem*

- Session: NeurDis-PMA June, 2. 12:40—14:00 Room: B
“NeurDis workshop: Precision Medicine and Actigraphy”
 Chair: Athanasios Tsanas Co-Chair: Andrés Gómez-Rodellar

 - “The effect of breathing maneuvers on the interaction between pulse fluctuation and heart rate variability” *Maria Bonomini, Nicolás Alberto Posteguillo*
 - “Horizon Cyber-Vision: A cybernetic approach for a cortical visual prosthesis” *Mikel Val-Calvo, Fabrizio Grani, Jose Manuel Ferrandez, Eduardo Fernandez, Roberto Morollón Ruiz, Leili Soo, Dorota Waclawczyk*
 - “The assessment of activities of daily living skills using visual prosthesis” *Dorota Waclawczyk, Leili Soo, Mikel Val-Calvo, Fabrizio Grani, Eduardo Fernandez, Roberto Morollón Ruiz*

- Session: **Robotics** June, 2. 12:40—14:00 Room: C
 Chair: Richard Duro Co-Chair: José Manuel Cuadra Troncoso

 - “Inter-session transfer learning in MI based BCI for controlling an exoskeleton” *Laura Ferrero, Vicente Quiles, Mario Ortiz, Javier V. Juan, Eduardo Iáñez, José M. Azorín*
 - “Autonomous Knowledge Representation for Efficient Skill Learning in Cognitive Robots” *Alejandro Romero, Francisco Bellas, Richard Duro, Blaz Meden*
 - “Autonomous Robot Navigation by Areas Centroid Algorithm Using Depth Cameras” *Francisco Antonio Marín, José Manuel Cuadra Troncoso, Félix de la Paz López, Jose Ramon Alvarez-Sanchez*

- Session: MALENE-III June, 2. 15:30—16:30 Room: A
“Workshop on Machine Learning in Neuroscience - III”
 Chair: Diego Castillo-Barnes Co-Chair: Francisco Jesus Martínez-Murcia

 - “Representational Similarity Analysis: A preliminary step to fMRI-EEG data fusion in MVPALab” *David López-García, Juan M Gorriz, María Ruz, Jose María González-Peñalver*
 - “Towards mixed mode biomarkers: combining structural and functional information by deep learning”
Andres Ortiz García, Juan Eloy Arco, Marco A. Formoso, Nicolás J. Gallego-Molina, Ignacio Rodriguez-Rodriguez, Francisco Jesus Martínez-Murcia, Juan M Gorriz, Javier Ramirez
 - “Modelling the progression of the symptoms of parkinsons disease using a nonlinear decomposition of 123I FP-CIT SPECT images”
Francisco Jesus Martínez-Murcia, Javier Ramirez, Diego Castillo-Barnes, Juan M Gorriz, Jose Antonio Simon-Rodriguez

- Session: MLCVR-I June, 2. 15:30—16:30 Room: B
“Machine Learning in Computer Vision and Robotics - I”
 Chair: José García-Rodríguez Co-Chair: Enrique Dominguez

 - “Enhanced image segmentation by a novel Test Time Augmentation and super-resolution.” *Iván García Aguilar, Jorge García-González, Rafael Marcos Luque-Baena, Ezequiel Lopez-Rubio, Enrique Dominguez*
 - “Encoding Generative Adversarial Networks for defense against image classification attacks”
Jorge García-González, Miguel A. Molina-Cabello, Karl Thurnhofer-Hemsi, Ezequiel Lopez-Rubio, José M. Pérez-Bravo, José A. Rodríguez-Rodríguez
 - “Anomalous trajectory detection for automated traffic video surveillance”
Jorge García-González, Rafaela Benítez-Rochel, Miguel A. Molina-Cabello, Ezequiel Lopez-Rubio, Jose D. Fernández

- Session: IS4ATAMCI-I June, 2. 15:30—16:30 Room: C
“Intelligent Systems for Assessment, Treatment, and Assistance in Mild Cognitive Impairment - I”
 Chair: Rafael Martínez Tomás Co-Chair: Mariano Rincón

 - “Artificial Intelligence applied to spatial cognition assessment”
Michela Ponticorvo, Mario Coccorese, Onofrio Gigliotta
 - “Automatic diagnosis of Mild Cognitive Impairment using Siamese Neural Networks” *Margarita Bachiller Mayoral, Mariano Rincon Zamorano*
 - “A Comparison of Feature-based Classifiers and Transfer Learning Approaches for Cognitive Impairment Recognition in Language”
Monica Gonzalez Machorro, Rafael Martinez Tomas

- Session: MALENE-IV June, 2. 16:30—17:20 Room: A
“Workshop on Machine Learning in Neuroscience - IV”
 Chair: Fermin Segovia Co-Chair: Carmen Jimenez-Mesa

 - “Capacity estimation from environmental audio signals using Deep Learning”
Cristina Reyes-Daneri, Francisco Jesus Martínez-Murcia, Andres Ortiz García
 - “Covid-19 detection by Wavelet Entropy and Self-adaptive PSO”
Shui-Hua Wang, Juan M Gorriz, Yu-Dong Zhang, Wei Wang
 - “RDNet: ResNet-18 with Dropout for blood cell classification”
Shui-Hua Wang, Juan M Gorriz, Yu-Dong Zhang, Ziquan Zhu, Zeyu Ren
 - “Automatic Diagnosis of Myocarditis in Cardiac Magnetic Images Using CycleGAN and Deep PreTrained Models”
Afshin Shoeibi, Navid Ghassemi, Mitra Rezaei, Juan M Gorriz, Jonathan Heras

- Session: MLCVR-II June, 2. 16:30—17:20 Room: B
“Machine Learning in Computer Vision and Robotics - II”
 Chair: José García-Rodríguez Co-Chair: Enrique Dominguez

 - “Defining high risk landslide areas using Machine Learning”
Jaime Salvador, Jose Garcia-Rodriguez, Byron Guerrero, Christian Mejia-Escobar, Michelle Bonifaz, Oswaldo Gallardo
 - “Landslide prediction with Machine Learning and time windows”
Jaime Salvador, Jose Garcia-Rodriguez, Byron Guerrero, Christian Mejia-Escobar, Michelle Bonifaz, Oswaldo Gallardo
 - “Live TV streaming latency measurement using YOLO”
Esteve Brotons, Miguel Angel Santiago Cabello, Jose Garcia-Rodriguez

- Session: IS4ATAMCI-II June, 2. 16:30—17:20 Room: C
“Intelligent Systems for Assessment, Treatment, and Assistance in Mild Cognitive Impairment - I”
 Chair: Mariano Rincón Zamorano Co-Chair: Rafael Martínez Tomás

 - “Detection of Alzheimer’s disease using a four-channel EEG montage”
Eduardo Perez-Valero, Jesus Minguillon, Christian Morillas, Francisco Pelayo, Miguel Lopez
 - “Evaluating imputation methods for missing data in a MCI dataset”
Alba Gómez-Valadés, Mariano Rincon Zamorano, Rafael Martinez Tomas, Juan Guerrero
 - “Automatic scoring of Rey-Osterrieth Complex Figure Test using Recursive Cortical Networks”
Fernando Javier Pinilla Martinez, Rafael Martinez Tomas, Mariano Rincon Zamorano

- Session: Plenary-V June, 3. 09:00—10:00 Room: A
“Invited speaker: Prof. Luis M. Sarro”

- Session: MALENE-V June, 3. 10:00—11:00 Room: A
“Workshop on Machine Learning in Neuroscience - V”
Chair: Yu-Dong Zhang Co-Chair: Juan M. Gorriz

 - “Quantifying inter-hemispheric differences in Parkinson’s Disease using siamese networks” *Juan Eloy Arco, Andres Ortiz García, Diego Castillo-Barnes, Juan M Gorriz, Javier Ramirez*
 - “Analyzing statistical inference maps using MRI images for Parkinson’s Disease” *Carmen Jimenez-Mesa, Diego Castillo-Barnes, Juan Eloy Arco, Fermin Segovia, Javier Ramirez, Juan M Gorriz*
 - “Evaluating intensity concentrations during the spatial normalization of functional images for Parkinson’s Disease”
Diego Castillo-Barnes, Juan Eloy Arco, Carmen Jimenez-Mesa, Javier Ramirez, Juan M Gorriz, Diego Salas-Gonzalez

- Session: MLCVR-III June, 3. 10:00—11:00 Room: B
“Machine Learning in Computer Vision and Robotics - III”
Chair: Enrique Dominguez Co-Chair: José García-Rodríguez

 - “Analysis of functional connectome pipelines for the diagnosis of autism spectrum disorders”
Domingo López Rodríguez, Karl Thurnhofer-Hemsi, Ezequiel Lopez-Rubio, Rafael Marcos Luque-Baena, Clara Jiménez-Valverde, Rosa Maza-Quiroga
 - “A Novel Continual Learning Approach for Competitive Neural Networks”
Esteban Palomo, Juan Miguel Ortiz-de-Lazcano-Lobato, Ezequiel Lopez-Rubio, Rosa Maza-Quiroga, José David Fernández-Rodríguez
 - “SCASA: From Synthetic to real Computer-Aided Sperm Analysis”
Daniel Hernández Ferrándiz, Juan Pantrigo, Raúl Cabido

- Session: BICA-I June, 3. 10:00—11:00 Room: C
“Bio-Inspired Computing Approaches - I”
Chair: José Santos Co-Chair: Ramiro Varela

 - “Robust Makespan Optimization via Genetic Algorithms on the Scientific Workflow Scheduling Problem” *Pablo Barredo, Jorge Puente Peinador*
 - “Compiling single round QCCP-X quantum circuits by genetic algorithm”
Riccardo Rasconi, Angelo Oddi, Ramiro Varela Arias, Miguel Ángel González, Lis Arufe
 - “Elite Artificial Bee Colony for Makespan Optimisation in Job Shop with Interval Uncertainty” *Juan José Palacios, Ines Gonzalez-Rodriguez, Camino Rodriguez, Hernán Díaz*

- Session: **IA-Apps-II** June, 3. 11:20—12:40 Room: A
 Chair: Ricardo Contreras Co-Chair: Vicente Matellan Olivera

 - “An approach to emotions through lexical availability”
Ricardo Contreras, Maria Pinninghoff, Pedro Salcedo Lagos, Pedro Pinacho-Davidson, Gabriela Kotz
 - “A bacteria-based metaheuristic as a tool for group formation”
Ricardo Contreras, Pedro Pinacho-Davidson, Maria Pinninghoff, Valentina Hernández
 - “KANT: A tool for Grounding and Knowledge Management”
Miguel Á. González-Santamarta, Francisco J. Rodríguez-Lera, Francisco Martín, Camino Fernández, Vicente Matellán

- Session: **Biomedical-II** June, 3. 11:20—12:40 Room: B
 Chair: Rafael Verdú-Monedero Co-Chair: Mariano Rincón Zamorano

 - “Brain Shape Correspondence Analysis Using Variational Mixtures for Gaussian Process Latent Variable Models” *Juan Pablo Velasquez Minoли, Hernan Felipe Garcia Arias, Álvaro Orozco-Gutiérrez*
 - “Explainable Artificial Intelligence to detect breast cancer: A qualitative case-based visual interpretability approach”
Mariano Rincon Zamorano, Sonia Valladares-Rodriguez, Margarita Bachiller Mayoral, Marta Rodriguez-Sampaio

- Session: BICA-II June, 3. 11:20—12:40 Room: C
“Bio-Inspired Computing Approaches - II”
 Chair: Ramiro Varela Co-Chair: José Santos

 - “Energy Minimization vs. Deep Learning Approaches for Protein Structure Prediction” *Daniel Varela, José Santos Reyes, Juan Luis Filgueiras*
 - “Constructing ensembles of dispatching rules for multi-objective problems” *Francisco Javier Gil Gala, Marko Durasević, Lucija Planinić, Domagoj Jakobović*
 - “Building heuristics and ensembles for the travel salesman problem”
Francisco Javier Gil Gala, Marko Durasević, María R. Sierra, Ramiro Varela Arias
 - “Reducing energy consumption in fuzzy flexible job shops using memetic search” *Pablo García Gómez, Ines Gonzalez-Rodriguez, Camino Rodriguez*

Social Program

Coffee break June 1, 2 and 3, from 11:00 to 11:20 h. served in the back of room A.

Lunch June 1 and 2, for registered participants (standard and attendant A) and accompanying persons with lunch ticket. Served at 14:00 h. in the restaurant inside the Congress Venue (Hotel Botánico).

June 1, Wednesday

18:00 h. – **Music & Light Synesthesia event** at *Room A* in Hotel Botánico.

20:00 h. – **Welcome reception and cocktail** served at *Lago Martiánez* (buses from Hotel Botánico depart at 20:00h.).

June 2, Thursday

18:00 – 21:00 Sightseeing **excursion** to *Teide Observatory* (buses will depart from Congress Venue) that will end at the place of the official dinner.

21:00 h. – Congress **official dinner** (casual wear) in *Restaurante Finca La Gañanía* (Camino del Durazno, 71, Puerto de la Cruz Plus Code: [7CW5CF49+JM](#)) Buses will depart from Congress Venue at 18:00h.

Congress Venue

HOTEL BOTÁNICO & THE ORIENTAL SPA GARDEN

Avenida Richard J Yeoward, 1

E-38400 Puerto de la Cruz - Tenerife (Spain)

Spain

Plus Code: [7CW5CF66+JQ](#)

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

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.

Language

English will be the official language of IWINAC2022. Simultaneous translation will *not* be provided.

Registration Fees

The registration form must be completed with the Conference Technical Secretariat, BCD Travel (please, see the address below), 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	Until April 30th	After April 30th
Standard (*) (+) (#)	€525	€625
Session Organizer (*) (+) (#)	€425	€525
Attendant A (*) (+)	€200	€225
Attendant B (+)	€125	€150
2nd paper and more (#)	€325	€375

- (*) Includes attending the sessions, coffee breaks and lunches.
- (+) Includes social events (welcome reception cocktail and sight-seeing tour) and official dinner.
- (#) Includes the “Lecture Notes in Computer Science” books (Springer-Verlag) of the work-conference proceedings.

Technical Secretariat of the Conference

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

BCD m&e

Avenida Maisonnave, 11, 7^o

E-03003 Alicante (Spain)

Phone: (+34) 965-22-83-93

E-mail: <eventos.alc@bcdme.es>

Starting 17:00 h. **May 31**, and during the Conference, the Secretariat will maintain a desk at the congress venue. Previous registration will be necessary to attend the Conference. Registration form: <https://v.gd/IWINAC2022registrationform>



Congress URL <http://www.iwinac.org/iwinac2022/>

Travel Information

[Tenerife Norte-Ciudad de La Laguna Airport](#) (international code “TFN”) with flights mainly from Spain, is located 26 km from the Congress venue (taxi rates around 35 euros). [Tenerife Sur - Reina Sofia Airport](#) (international code “TFS”) with international flights, is located 86 km from the Congress venue (taxi rates around 130 euros).

Please, contact our [Technical Secretariat](#) (BCD m&e) for more detailed information on travel and accommodation.

[Puerto de la Cruz](#) is located at about 28°25’N and 16°33’W, near the coast by the Atlantic Ocean in the north of the Tenerife island, in the Canary Islands (Spain). Puerto de la Cruz has warm, humid and arid climate. The temperature in June can vary from 23-25°C by day (sunny) to 18-20°C by night.

Interactive map of IWINAC2022 places: <https://is.gd/mapIWINAC2022>

Currency, Banks and Tipping

The monetary unit in Spain is the *EURO* (symbol €). The euro is divided into a hundred cents (symbol ¢). Coins: 1, 2, 5, 10, 20 and 50 cents; 1 and 2 euros. Banknotes: 5, 10, 20, 50, 100, 200 and 500 euros. Banknotes of 500 euros are usually only accepted at bank offices. The maximum cash payment allowed is 2500 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.

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 traveler’s checks.

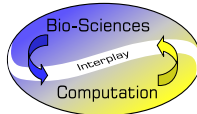
Since the service charge is normally included in restaurant, hotel and taxi bills, tipping is always optional.

Electricity

Electric supply is AC 220 V / 50 Hz standard continental European, with 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.



IWINAC2022



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Congress Venue:

HOTEL BOTÁNICO & THE ORIENTAL SPA GARDEN

Puerto de la Cruz - Tenerife (Spain)

May 31 – June 3, 2022

<http://www.iwinac.org/iwinac2022/>

