

IWINAC/ICINAC 2024

**10th INTERNATIONAL WORK-CONFERENCE
ON THE INTERPLAY BETWEEN NATURAL
AND ARTIFICIAL COMPUTATION**

FULL PROGRAM

Olhao, Algarve, Portugal.

4 – 7 June, 2024

Organized by

Universidad Politécnica de Cartagena

Universidad de Granada

Universidad Politécnica de Valencia

in cooperation with

Universidade do Algarve

Nova University Lisbon



<http://www.icinac.org/iwinac.org/iwinac2024/index.html>

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Acknowledgments

IWINAC/ICINAC2024 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 IWINAC/ICINAC2024 in memoriam to Prof. Mira. IWINAC/ICINAC2024 has been organized by Universidad Politécnica de Cartagena (UPCT), Universidad de Granada (UGR) and Universidad Politécnica de Valencia (UPV) in cooperation with Universidad de Algarve and Universidad Nova de Lisboa. We acknowledge the sponsorship and/or technical and logistic support from:

IWINAC/ICINAC2024 has been organized by Universidad Politécnica de Cartagena (UPCT) and Universidad de Granada (UGR) in cooperation with Universidade do Algarve and Nova University Lisbon.

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

- [Universidad Politécnica de Cartagena.](#)
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- [Apliquem MicroOnes, 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 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.

Proceedings

The proceedings will be published in Springer Lecture Notes in Computer Science series ([LNCS](#)), volumes: [LNCS-14674](#), and [LNCS-14675](#).

Conference Organization

General Chair

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

Organizing Committee

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CARLA QUINTAO
LUIS SILVA

Universidade NOVA de Lisboa (Portugal)
Universidade NOVA de Lisboa (Portugal)

Invited Speakers

HOJJAT ADELI	<i>Ohio State University (USA)</i>
ZIDONG WANG	<i>Brunel University (UK)</i>
NUNO M. GARCIA	<i>University of Edinburgh (UK)</i>
ASOKE NANDI	<i>Brunel University (UK)</i>

Field Editors

Sung Bae.Cho	<i>Yonsei University (South Korea)</i>
Emilia Barakova	<i>Eindhoven University of Technology (The Netherlands)</i>
Gema Benedicto	<i>Universidad Politécnica de Cartagena (Spain)</i>
Diego Castillo-Barnes	<i>Universidad de Granada (Spain)</i>
Enrique Dominguez	<i>Universidad de Málaga (Spain)</i>
Félix de la Paz	<i>Univ. Nacional de Educación a Distancia (Spain)</i>
Antonio Fernández Caballero	<i>Universidad Castilla-La Mancha (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>
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Marina Jodra	<i>Universidad Complutense de Madrid (Spain)</i>
Vicente Julián-Inglada	<i>Universitat Politècnica de València (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>
Jorge Pérez-Aracil	<i>Universidad de Alcalá (Spain)</i>
Javier Ramírez	<i>Universidad de Granada (Spain)</i>
Mariano Rincón Zamorano	<i>Universidad Nacional de Educación a Distancia (Spain)</i>
Sancho Salcedo	<i>Universidad de Alcalá (Spain)</i>
Jose Santos Reyes	<i>Universidade da Coruña (Spain)</i>
Fermín Segovia	<i>Universidad de Granada (Spain)</i>
Antonio Tallón	<i>Universidad de Huelva (Spain)</i>
Ramiro Varela	<i>Universidad de Oviedo (Spain)</i>

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Jan Treur, The Netherlands
Ramiro Varela Arias, Spain
Hujun Yin, UK
Yu-Dong Zhang, UK

Program Outline. Detailed session contents and social events in pages 8 – 22.

Tuesday June 4	
morning	<i>free time</i>
15:30–20:00	<i>Registration at Technical Secretariat desk</i>

Wednesday June 5			
08:30–09:00	<i>Opening Ceremony</i>		
09:00–10:00	<i>Plenary Session I: Prof. Hojjat Adeli</i>		
10:00–11:00	<i>Plenary Session II: Nuno M. García</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-I</i>	<i>MLCVR-I</i>
12:40–14:00	<i>MALENE-II</i>	<i>NEURDIS-II</i>	<i>MLCVR-II</i>
14:00–15:30	<i>lunch</i>		
15:30–16:30	<i>Posters attendance with stand-up coffee</i>		
16:30–17:30	<i>Presentation of the book “Cerebral Dynamics” of Dr. Justo Gonzalo</i>		
17:30–19:00	<i>Spanish thematic network meeting</i>		
19:00–20:00	<i>free time</i>		
20:00–	<i>Welcome Reception and Cocktail</i>		

Thursday June 6			
09:00–10:00	<i>Plenary Session III: Prof. Zidong Wang</i>		
	Room A:	Room B:	Room C:
10:00–11:00	<i>MALENE-III</i>	<i>NEURDIS-III</i>	<i>ISATA</i>
11:00–11:20	<i>coffee break</i>		
	Room A:	Room B:	Room C:
11:20–12:40	<i>MALENE-IV</i>	<i>BICA-I</i>	<i>MLCVR-III</i>
12:40–14:00	<i>MALENE-V</i>	<i>BICA-II</i>	<i>AIN</i>
14:00–15:30	<i>lunch</i>		
15:30–16:30	<i>SHIFT-I</i>	<i>LTL</i>	<i>Applications</i>
16:30–17:30	<i>SHIFT-II</i>		
17:30–18:00	<i>free time</i>		
18:00–	<i>Sightseeing excursion & Official Dinner</i>		

Friday June 7			
09:00–10:00	<i>Plenary Session IV: Prof. Asoke Nandi</i>		
	Room A:	Room B:	Room C:
10:00–11:00	<i>SRE-I</i>	<i>AFCAI-I</i>	<i>SCAPC-I</i>
11:00–11:20	<i>coffee break</i>		
11:20–12:40	<i>SRE-II</i>	<i>AFCAI-II</i>	<i>SCAPC-II</i>
12:40–14:00	<i>Closing Ceremony</i>		
afternoon	<i>free time</i>		

- Session: Plenary-I June, 5. 09:00—10:00 Room: A
Invited speaker: Prof. Hojjat Adeli:

- Session: Plenary-II June, 5. 10:00—11:00 Room: A
Invited speaker: Prof. Nuno M. Garcia:

- Session: MALENE-I June, 5. 11:20—12:40 Room: A
“3rd. Workshop on Machine Learning in Neuroscience. I”
Chair: J.M. Gorriz Co-Chair: F.J. Martínez-Murcia

 - “Morning anxiety detection through smartphone-based photoplethysmography signals analysis using machine learning methods” *Masoud Sistaninezhad, Ali Jafarizadeh, Saman Rajebi, Siamak Pedrammehr, Roohallah Alizadehsani, Juan M Gorriz*
 - “Visualizing Brain Synchronization: an explainable representation of phase-amplitude coupling” *Andres Ortiz García, Nicolás J. Gallego-Molina, Ignacio Rodríguez-Rodríguez, Diego Castillo-Barnés, Juan M Gorriz*
 - “Enhancing Neuronal Coupling Estimation by NIRS/EEG Integration” *Nicolás J. Gallego-Molina, Andres Ortiz García, Marco A. Formoso, Francisco Jesus Martínez-Murcia, Wai Lok Woo*
 - “Causal Mechanisms of Dyslexia Via Connectogram Modeling of Phase Synchrony” *Ignacio Rodríguez-Rodríguez, Andres Ortiz García, Marco A. Formoso, Nicolás J. Gallego-Molina, Juan Luis Luque*

- Session: NEURDIS-I June, 5. 11:20—12:40 Room: B
“Workshop on Functional Evaluation of Neuromotor and Cognitive Disorders. I Hommage to Victoria Rodellar”
Chair: J.M. Ferrández Co-Chair: P. Gómez

 - “Stress Classification Model Using Speech: An Ambulatory Protocol-Based Database Study” *Lara Eleonora Prado, Andrea Hongn, Patricia Pelle, María Paula Bonomini*
 - “Exploring Spatial Cognition: Comparative Analysis of Agent-Based Models in Dynamic and Static Environments” *Maria Luongo, Michela Ponticorvo, Nicola Milano*
 - “Machine Learning for Personality Type Classification on textual data” *Manuel Graña, Javier de Lope, Igone Morais-Quílez*

- “Grad-CAM applied to the detection of instruments used in facial presentation attacks” *Daniel Palacios-Alonso, Irene García-Rubio, Roberto Gallardo-Cava, David Ortega-delCampo, Julio Guillén-García, Cristina Conde*
- Session: MLCVR-I June, 5. 11:20—12:40 Room: C
“Machine Learning in Computer Vision and Robotics. I”
 Chair: J. García- Rodríguez Co-Chair: E.Domínguez
 - “Unsupervised detection of incoming and outgoing traffic flows in video sequences”
Jose D. Fernández-Rodríguez, Pablo Carmona-Martínez, Rafaela Benítez-Rochel, Miguel A. Molina-Cabello, Ezequiel Lopez-Rubio
 - “A decentralized collision avoidance algorithm for individual and collaborative UAVs”
Julian Estevez, Daniel Caballero-Martin, Jose Manuel López-Guede, Manuel Graña
 - “Improved Surface Defect Classification from a Simple Convolutional Neural Network by Image Preprocessing and Data Augmentation”
Francisco López de la Rosa, José L. Gómez-Sirvent, Rafael Morales, Roberto Sánchez-Reolid, Antonio Fernández-Caballero, Lucía Moreno-Salvador
 - “Prediction of Optimal Locations for 5G Base Stations in Urban Environments using Neural Networks and Satellite Image Analysis”
Iván García Aguilar, Jesús Galeano Brajones, Francisco Luna Valero, Javier Carmona Murillo, Jose D. Fernández-Rodríguez, Rafael Marcos Luque Baena
- Session: MALENE-II June, 5. 12:40—14:00 Room: A
“3rd. Workshop on Machine Learning in Neuroscience. II”
 Chair: F.J. Martínez-Murcia Co-Chair: J.M. Gorriz
 - “Explainable Exploration of the Interplay between HRV Features and EEG Local Connectivity Patterns in Dyslexia”
Marco A. Formoso, Andres Ortiz García, Nicolás J. Gallego-Molina, Ignacio Rodriguez-Rodriguez, Almudena Giménez
 - “Enhancing Intensity Differences in EEG Cross-Frequency Coupling Maps for Dyslexia Detection”
Diego Castillo-Barnes, Andres Ortiz García, Nicolás J. Gallego-Molina, Juan Luis Luque, Pietro Stabile, Patricia Figueiredo
 - “Improving Prediction of Mortality in ICU via Fusion of SelectKBest with SMOTE Method and Extra Tree Classifier”

Javad Hassannataj Joloudari, Mohammad Ali Nematollahi, Roohallah Alizadehsani, Juan M Gorriz, Mohammad Maftoun, Omid Zare, Maryam Khademi, Alireza Atashi

- “A Cross-Modality Latent Representation for the Prediction of Clinical Symptomatology in Parkinson’s Disease”
Francisco Jesus Martínez-Murcia, Juan Eloy Arco, Ignacio Alvarez Illan, Carmen Jimenez-Mesa, Javier Ramirez, Juan M Gorriz, Cristóbal Vázquez-García

- Session: NEURDIS-II June, 5. 12:40—14:00 Room: B
“Workshop on Functional Evaluation of Neuromotor and Cognitive Disorders. II

Hommage to Victoria Rodellar”

Chair: P. Gómez

Co-Chair: J.M. Ferrández

- “Comparison of an Accelerated Garble Embedding Methodology for Privacy Preserving in Biomedical Data Analytics”
Agustín Álvarez-Marquina, Esther Núñez-Vidal, Francisco Domínguez-Mateos, Daniel Palacios-Alonso, Nikola Hristov-Kalamov, Raúl Fernández-Ruiz
- “Unfolding Laryngeal Neuromotor Activity in Parkinson’s Disease by Phonation Inversion”
Pedro Gomez Vilda, Andrés Gómez-Rodellar, Jiri Mekyska, Daniel Palacios-Alonso, Agustín Álvarez Marquina
- “Personalization of child-robot interaction through reinforcement learning and user classification”
Anniek Jansen, Emilia I. Barakova, Konstantinos Tsiakas
- “EGG: AI-based Interactive Design Object for Managing Post-operative Pain in Children”
Jing Li, Emilia I. Barakova, Milou Mutsaers, Kuankuan Chen, Liuyiyi Yang

- Session: MLCVR-II June, 5. 12:40—14:00 Room: C
“Machine Learning in Computer Vision and Robotics. II”

Chair: E.Domínguez

Co-Chair: J. García-Rodríguez

- “Enhanced Cellular Detection Using Convolutional Neural Networks and Sliding Window Super-Resolution Inference”
Iván García Aguilar, Rostyslav Zavoiko, Jose D. Fernández-Rodríguez, Rafael Marcos Luque Baena, Ezequiel López Rubio
- “Exploring Text-Driven Approaches for Online Action Detection”
Manuel Benavent-Lledo, David Mulero-Pérez, David Ortiz-Perez, Jose Garcia-Rodriguez, Sergio Orts-Escolano

- “Deep Learning for Assistive Decision-Making in Robot-Aided Rehabilitation Therapy”
David Martínez Pascual, Jose María Catalán Orts, Andrea Blanco Ivorra, Nicolas Garcia-Aracil, Luis Daniel Lledó Pérez
- “Text-Driven Data Augmentation Tool for Synthetic Bird Behavioural Generation”
David Mulero-Pérez, David Ortiz-Perez, Manuel Benavent-Lledo, Jose Garcia-Rodriguez, Jorge Azorin-Lopez

- Session: Posters June, 5. 15:30—16:30 Room: P
“Posters attendance with stand-up coffee”
 Chair: José Manuel Ferrández Co-Chair: P. Bonomini

1. “Topic detection in COVID-19 mortality time series”
Manuel Graña, Goizalde Badiola
2. “Multicenter Prospective Blind External Validation of a Machine Learning Model for Predicting Heart Failure Decompensation: A 3-Hospital Validation Study”
Jon Kerezeta, Esperança Lladó Pascual, Nicola Goodfellow, Cristina Martin, Karina Anahi Ojanguren Carreira, Marco Manso, Barbara Guerra, Stanke Ladislav, Vohralík Tomáš, Esteban Fabello, Tatiana Silva, Prof Michael Scott, Dr Glenda Fleming, Andoni Beristain, Manuel Graña
3. “Fidex: an Algorithm for the Explainability of Ensembles and SVMs”
Guido Bologna, Jean-Marc Boutay, Quentin Leblanc, Damian Boquete
4. “Mitigating Class Imbalance in Time Series with Enhanced Diffusion Models”
Enrique Hortal, Ryan Sijstermans, Chang Sun
5. “Measuring spatial behaviour and cognition: a method based on trajectories analysis and supported by technology and Artificial Intelligence”
Michela Ponticorvo
6. “Clustering COVID-19 mortality time series”
Manuel Graña, Murat Razi
7. “Matrix Representation of Virus Machines”
Antonio Ramírez de Arellano, David Orellana-Martín, Mario J. Perez Jimenez, Francis George C. Cabarle, Henry N. Adorna
8. “Networks of Splicing Processors With Various Topologies”
Victor Mitrana, Mihaela Paun, Jose Angel Sanchez Martin
9. “Brainstorming on dataset reduction from an heuristic bioinspired green computing approach”
Jose David Nuñez Gonzalez, Manuel Graña, Ana Paula Aravena Cifuentes, Lucia Porlan Ferrando

10. “Diagnosis of cervical cancer using a deep learning explainable fusion model”
Andrés Bueno-Crespo, Juan Morales-García, Raquel Martínez-España, Ana Ortiz-González, Baldomero Imbernón, José Martínez-Más, Daniel Rosique-Egea, Mauricio Álvarez
11. “The Implementation of Artificial Intelligence Based Body Tracking for the Assessment of Orientation and Mobility Skills in Visual Impaired Individuals”
Roberto Morollón Ruiz, Leili Soo, Joel Alejandro Cueva Garcés, Eduardo Fernandez
12. “Application of Graph Fourier Transform in the Diagnosis of Left Bundle Branch Block from Electrocardiographic Signals”
Beatriz del Cisne Macas Ordoñez, Diego Vinicio Orellana Villavicencio, Marco Augusto Suing Ochoa, Maria Paula Bonomini
13. “Strict left bundle branch block diagnose through explainable artificial intelligence”
Beatriz del Cisne Macas Ordoñez, Francisco Javier Garrigos Guerrero, Jose Javier Martinez-Alvarez, José Manuel Ferrandez, Suraj Karki, Maria Paula Bonomini
14. “Cardiac impulse propagation in Left Bundle Branch Block”
Beatriz del Cisne Macas Ordoñez, Fernando Ingallina, Diego Vinicio Orellana Villavicencio, Maria Paula Bonomini
15. “Wearable device dataset for stress detection”
Andrea Hongn, Lara Eleonora Prado, Maria Paula Bonomini, Facundo Bosch

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- Session: Plenary-III June, 6. 09:00—10:00 Room: A
Invited speaker: Prof. Zidong Wang:

 - Session: MALENE-III June, 6. 10:00—11:00 Room: A
“3rd. Workshop on Machine Learning in Neuroscience - III”
Chair: J. Ramírez Co-Chair: A. Ortíz

 - “Zero-Shot Ensemble of Language Models for Fine-Grain Mental-Health Topic Classification” *Cristina Luna Jiménez, Zoraida Callejas, David Griol*
 - “Enhancing Interpretability in Machine Learning: A Focus on Genetic Network Programming, Its Variants, and Applications” *Mohamad Roshanzamir, Roohallah Alizadehsani, Seyed Vahid Moravvej, Javad Hassannataj Joloudari, Hamid Alinejad-Rokny, Juan M Gorriz*
 - “Enhancing Coronary Artery Disease Classification Using Optimized MLP Based On Genetic Algorithm”
Mohammad Maftoun, Omid Zare, Javad Hassannataj Joloudari, Mohammad Ali Nematollahi, Roohallah Alizadehsani, Juan M Gorriz, Mohammad Hashemi, Seyedeh Somayeh Salehi Komamardakhi, Pietro Sala
 - “Extracting heart rate variability from NIRS signals for an explainable detection of learning disorders”
Juan Eloy Arco, Nicolás J. Gallego-Molina, Javier Ramirez, Juan M Gorriz, Andres Ortiz García, Pedro J López-Pérez

 - Session: NEURDIS-III June, 6. 10:00—11:00 Room: B
“Workshop on Functional Evaluation of Neuromotor and Cognitive Disorders. III Hommage to Victoria Rodellar”
Chair: E. Barakova Co-Chair: A. Gómez

 - “Cepstral Space Projection on the Evaluation of Autistic Speech: A Pilot Study”
Andrés Gómez-Rodellar, Marina Jodra, José Manuel Ferrandez, Pedro Gomez Vilda
 - “Unravelling the robot gestures interpretation by children with Autism Spectrum Disorder during Human-Robot Interaction”
Gema Benedicto Rodríguez, Antonio Fernández-Caballero, Eduardo Fernandez, José Manuel Ferrandez, Carlos G. Juan

- “Real-Time Emotion Detection System’s Impact on Pivotal Response Training Protocol”
Gema Benedicto Rodríguez, Félix de la Paz López, Antonio Fernández-Caballero, Eduardo Fernandez

- Session: **ISATA** June, 6. 10:00—11:00 Room: C
“Intelligent Systems for Assessment, Treatment, and Assistance in early stages of Alzheimer’s disease and other dementias”

Chair: P. Bonomini

Co-Chair: José Ramón Álvarez Sanchez

- “Assessing the interplay of attributes in dementia prediction through the integration of Graph Embeddings and unsupervised learning”
Antonio Berlanga, Miguel Angel Patricio Guisado, Jose Manuel Molina Lopez, Pablo Zubasti
- “Bayesian Network structures for early diagnosis of MCI using semantic fluency tests”
Alba Gómez-Valadés, Rafael Martínez Tomas, Mariano Rincon Zamorano
- “Connectivity Patterns in Alzheimer Disease and Frontotemporal Dementia Patients using Graph Theory”
Maria Paula Bonomini, Eduardo Gighlioni, Noelia R\’ios

- Session: **MALENE-IV** June, 6. 11:20—12:40 Room: A
“3rd. Workshop on Machine Learning in Neuroscience - IV”

Chair: Andres Ortiz García

Co-Chair: Javier Ramirez

- “Diagnosis of Parkinson Disease from EEG Signals Using a CNN-LSTM Model and Explainable AI” *Mohammad Bdaqli, Afshin Shoeibi, Parisa Moridian, Mozhdé Firoozi Pouyani, Ahmad Shalhaf, Juan M Gorriz, Delaram Sadeghi*
- “Early Diagnosis of Schizophrenia in EEG Signals Using One Dimensional Transformer Model” *Afshin Shoeibi, Mahboobeh Jafari, Delaram Sadeghi, Roohallah Alizadehsani, Hamid Alinejad-Rokny, Amin Beheshti, Juan M Gorriz*
- “Diagnosis of Schizophrenia in EEG Signals Using dDTF Effective Connectivity and New PreTrained CNN and Transformer Models”
Afshin Shoeibi, Marjane Khodatars, Hamid Alinejad-Rokny, Jónathan Heras, Sara Bagherzadeh, Amin Beheshti, Juan M Gorriz
- “A Survey on EEG Phase Amplitude Coupling to Speech Rhythm for the Prediction of Dyslexia”
Nicolás J. Gallego-Molina, Francisco Jesus Martínez-Murcia, Marco A. Formoso, Diego Castillo-Barnes, Andres Ortiz García, Javier Ramirez, Juan M Gorriz, Pedro Javier Lopez-Perez, Juan Luis Luque

- Session: BICA-I June, 6. 11:20—12:40 Room: B
“Bio-Inspired Computing Approaches. I”
 Chair: R. Varela Co-Chair: J. Santos

 - “Refinement of Protein Structures with a Memetic Algorithm. Examples with SARS-CoV-2 Proteins”
Juan Luis Filgueiras, José Santos Reyes
 - “Evolutionary algorithms for bin packing problem with maximum lateness and waste minimization” *Jesús Quesada, Francisco Javier Gil Gala, Marko Durasević, María R. Sierra, Ramiro Varela Arias*
 - “Stationary Wavelet Entropy and Cat Swarm Optimization to Detect COVID-19”
Yudong Zhang
 - “Private Inference on Layered Spiking Neural P Systems”
Mihail-Iulian Pleșa, Marian Gheorghe, Florentin Ipate

- Session: MLCVR-III June, 6. 11:20—12:40 Room: C
“Machine Learning in Computer Vision and Robotics. III”
 Chair: R. Moreno Co-Chair: J. García-Rodríguez

 - “Deep Learning for Enhanced Risk Assessment in Home Environments” *Javier Rodríguez Juan, David Ortiz-Perez, Jose Garcia-Rodriguez, David Tomás*
 - “Lightweight CNNs for Advanced Bird Species Recognition on the Edge”
Javier Rodríguez Juan, David Ortiz-Perez, Jose Garcia-Rodriguez, Adrian Berenguer-Agullo
 - “Learning Adaptable Utility Models for Morphological Diversity” *Alejandro Romero, Richard Duro, Francella Campos-Alfaro, Carlos Jara, Martín Naya-Varela*
 - “Deep Learning-based Classification of Invasive Coronary Angiographies with Different Patch-generation Techniques” *Ariadna Jiménez-Partinen, Karl Thurnhofer-Hemsi, Esteban J. Palomo, Jorge Rodríguez-Capitán, Ana I. Molina-Ramos*

- Session: MALENE-V June, 6. 12:40—14:00 Room: A
“3rd. Workshop on Machine Learning in Neuroscience - V”
 Chair: C. Jiménez Co-Chair: A. Rodríguez

 - “Comprehensive Evaluation of Stroke Rehabilitation Dynamics: Integrating Brain-Computer Interface with Robotized Orthotic Hand and Longitudinal EEG Changes” *Yolanda Vales Gómez, Nicolas Garcia-Aracil, Jose María Catalán Orts, Andrea Blanco Ivorra, Juan Antonio Barrios Heredero*

- “PDBIGDATA: A new database for parkinsonism research focused on large models”
Rafael López, Francisco Jesus Martínez-Murcia, Javier Ramírez, Teodoro Martín-Noguerol, Félix Paulano-Godino, Antonio Luna, Juan M Gorriz, Fermin Segovia
- “A Comparative Study of Deep Learning Approaches for Cognitive Impairment Diagnosis Based on the Clock-Drawing Test”
Carmen Jimenez-Mesa, Juan Eloy Arco, Meritzel Valentí-Soler, Belén Frades-Payo, María Ascensión Zea-Sevilla, Andres Ortiz García, Javier Ramírez, Teodoro Del Ser Quijano, Juan M Gorriz, Marina Avila-Villanueva, Cristobal Carnero-Pardo

- Session: BICA-II June, 6. 12:40—14:00 Room: B
“Bio-Inspired Computing Approaches. II”
 Chair: J. Santos Co-Chair: R. Varela

- “Cooperative Multi-Fitness Evolutionary algorithm for Scientific Workflows Scheduling”
Pablo Barredo, Jorge Puente Peinador
- “Genetic Approach to Green Flexible Job Shop Problem Under Uncertainty” *Sezin Afsar, Jorge Puente Peinador, Juan José Palacios, Inés González-Rodríguez, Camino Rodriguez*

- Session: AIN June, 6. 12:40—14:00 Room: C
“Artificial Intelligence in Neurophysiology”
 Chair: E. Hortal Co-Chair: M. Val-Calvo

- “Prediction of Burst Suppression Occurrence Under General Anaesthesia using Pre-operative EEG Signals”
Enrique Hortal, Elif Yozkan, Joël Karel, Marcus L.F. Janssen, Carine J. Vossen, Erik D. Gommer
- “A novel approach to denoise and enhance the classification of waveforms in multielectrode recordings” *Rocío López Peco, Mikel Val-Calvo, Cristina Soto-Sánchez, Eduardo Fernandez*
- “Analysis of anxiety caused by fasting in obesity patients using EEG signals”
Mariana Elizalde Cano, Mario Ortiz, Eduardo Iáñez, José M. Azorín, Jessica Martínez, María Herranz-Lopez, Vicente Micol
- “Evolution of EEG fractal dimension along a sequential finger movement task”
Sara Kamali, Fabiano Baroni, Pablo Varona

- Session: SHIFT-I June, 6. 15:30—16:30 Room: A
“Social and Civil Engineering through Human AI Translations - I”
Chair: Fermin Segovia Co-Chair: D. López

 - “AI embedded in drone control”
José Manuel López Guede, Julian Estevez, Manuel Graña, Daniel Caballero-Martin
 - “Dual-System Recommendation Architecture for Adaptive Reading Intervention Platform for Dyslexic Learners”
J. Ignacio Mateo-Trujillo, Diego Castillo-Barnés, Ignacio Rodriguez-Rodriguez, Andres Ortiz García, Alberto Peinado, Juan Luis Luque, Auxiliadora Sánchez-Gómez
 - “Accurate LiDAR-based Semantic Classification for Powerline Inspection”
Fco Javier Luna Santa-María, Iván Gutiérrez Rodríguez, José Ramiro Martínez de Dios, Aníbal Ollero Baturone

- Session: LTL June, 6. 15:30—17:30 Room: B
“Learning tools to lecture”
Chair: A. Tallón Co-Chair: S. Bae

 - “Optimizing Didactic Sequences with Artificial Intelligence: Integrating Bloom’s Taxonomy and Emotion in the Selection of Educational Technologies”
Pedro Salcedo Lagos, Pedro Pinacho-Davidson, Maria Punninghoff, Ricardo Contreras, Karina Fuentes-Riffo, Miguel Friz Carrillo
 - “Contrastive Learning of Multivariate Gaussian Distributions of Incremental Classes for Continual Learning”
Hyung-Jun Moon, Sung-Bae Cho
 - “Influence of Color on Academic Performance: a Studio with Auditory Sustained Attention within a Virtual Scenario”
Ávila Muñoz, Miguel Lopez

- Session: Applications June, 6. 15:30—17:30 Room: C
Chair: J.M. Ferrández Co-Chair: P.Bonomini

 - “Towards the Conformation of Constructive Political Discussion Groups. A Computational Approach”
Pedro Pinacho-Davidson, Pedro Salcedo Lagos, Maria Punninghoff, Valentina Hernández, Ricardo Contreras, Karina Fuentes-Riffo
 - “Blockchain Framework Tailored for Agricultural IoTs”
Salaheddine Kably, Nabih Alaoui, Mounir Arioua, Khalid Choug dali, Samira Khouliji, María Dolores Gómez-López

- “Enhancing Plant Disease Detection in Agriculture through YOLOv6 Integration with Convolutional Block Attention Module”
María Dolores Gómez-López, Abdelilah Haijoub, Anas Hatim, Mounir Ar-ioua, Ahmed Elouialkadi

- Session: SHIFT-II June, 6. 16:30—17:30 Room: A
“Social and Civil Engineering through Human AI Translations - II”
 Chair: D. López Co-Chair: F. Segovia

- “RESISTO Project: Automatic detection of operation temperature anomalies for power electric transformers using thermal imaging”
David López-García, Fermin Segovia, Jacob Rodriguez-Rivero, Javier Ramirez, Juan M Gorriz, David Pérez, Raúl Serrano
- “RESISTO Project: Safeguarding the Power Grid from Meteorological Phenomena”
Jacob Rodriguez-Rivero, David López-García, Fermin Segovia, Javier Ramirez, Juan M Gorriz, Raúl Serrano, David Pérez, Aníbal Ollero Baturone, Ivan Maza, Pol Paradell Solà, Albert Gili Selga, Jose Luis Domínguez-García, Ana Romero, Alejandro Berro, Rocío Domínguez, Inmaculada Prieto
- “Multi-UAV System For Power-line Failure Detection within the RESISTO Project”
Alvaro Poma Aguilar, Ivan Maza, Aníbal Ollero Baturone, Francisco Roman-Escorza, Miguel Gil Castilla, Álvaro Caballero Gómez

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- Session: Plenary-V June, 7. 09:00—10:00 Room: A
Invited speaker: Prof. Asoke Nandi
 - Session: SRE-I June, 7. 10:00—11:00 Room: A
“Smart Renewable Energies: Advancing AI Algorithms in the Renewable Energy Industry - I”
Chair: D. Guijo Co-Chair: J. Pérez

 - “Machine Learning Health Estimation for Lithium-Ion Batteries under Varied Conditions” *Gabriel Leite, Jorge Pérez-Aracil, Carolina Marcelino, Gabriel Gutiérrez, Milan Prodanovic, Enrique García-Quismondo, Sergio Pinilla, Jesús Palma, Silvia Jiménez-Fernández, Sancho Salcedo-Sanz*
 - “Energy flux prediction using an ordinal soft labelling strategy” *Antonio Manuel Gómez-Orellana, Víctor Manuel Vargas Yun, Pedro Antonio Gutierrez, Jorge Pérez-Aracil, Sancho Salcedo-Sanz, Cesar Hervas Martinez, David Guijo-Rubio*
 - “Medium- and long-term wind speed prediction using the multi-task learning paradigm”
Antonio Manuel Gómez-Orellana, Víctor Manuel Vargas Yun, David Guijo-Rubio, Jorge Pérez-Aracil, Pedro Antonio Gutierrez, Sancho Salcedo-Sanz, Cesar Hervas Martinez
 - Session: AFCAI-I June, 7. 10:00—11:00 Room: B
“5th Workshop on Affective Computing and Context Awareness in Ambient Intelligence. I”
Chair: G. Nalepa Co-Chair: K. Kutt

 - “Human-in-the-Loop for Personality Dynamics: Proposal of a New Research Approach”
Krzysztof Kutt, Marzena Kutt, Bartosz Kawa, Grzegorz J. Nalepa
 - “Emotion Prediction in Real-Life Scenarios: On the Way to the BI-RAFFE3 Dataset”
Krzysztof Kutt, Grzegorz J. Nalepa
 - “Towards Enhanced Emotional Interaction in the Metaverse”
Vicente Julian, Jaime Rincon, Cedric Marco-Detchart
 - Session: SCAPC-I June, 7. 10:00—11:00 Room: C
“Socio-Cognitive, Affective and Physiological Computing - I”
Chair: A. Fernández- Caballero Co-Chair: F. de la Paz

 - “Binary Classification Methods for Movement Analysis from Functional Near-Infrared Spectroscopy Signals” *Roberto Sánchez-Reolid, José*

L. Gómez-Sirvent, José Manuel Ferrandez, Antonio Fernández-Caballero, Daniel Sánchez-Reolid, Alejandro L. Borja

- “Heart Attack Detection Using Body Posture and Facial Expression of Pain”
Antonio Fernández-Caballero, Antonio Pereira, Maria Teresa Lopez Bonal, Gabriel Rojas-Albarracín
- “Non-intrusive and easy-to-use IOT solution to improve elderly’s quality of life”
Antonio Fernández-Caballero, Antonio Pereira, Luis Correia, Nuno Costa

- Session: SRE-II June, 7. 11:20—12:40 Room: A
“Smart Renewable Energies: Advancing AI Algorithms in the Renewable Energy Industry - II”

Chair: P. Gutierrez

Co-Chair: S. Salcedo

- “Data augmentation techniques for extreme wind prediction improvement”
Marta Vega Bayo, Antonio Manuel Gómez-Orellana, Víctor Manuel Vargas Yun, David Guijo-Rubio, Jorge Pérez-Aracil, Sancho Salcedo-Sanz, Laura Corrnejo Bueno
- “Autoencoder framework for general forecasting”
Dušan Fister, Laura Corrnejo Bueno, Jorge Pérez-Aracil, Sancho Salcedo-Sanz, César Peláez-Rodríguez
- “Prediction of extreme wave heights via a fuzzy-based cascade ensemble model”
César Peláez-Rodríguez, Laura Corrnejo Bueno, Dušan Fister, Antonio Manuel Gómez-Orellana, Pedro Antonio Gutierrez, Cesar Hervas Martinez, Jorge Pérez-Aracil, Sancho Salcedo-Sanz
- “Machine learning as applied to shape parameterization of submerged arch structures.”
Waldemar Hugo LLamosas Mayca, Jorge Pérez-Aracil, Sancho Salcedo-Sanz, Eugenio Lorente-Ramos, Alejandro M. Hernández-Díaz, Manuel Damián García-Román

- Session: AFCAI-II June, 7. 11:20—12:40 Room: B
“5th Workshop on Affective Computing and Context Awareness in Ambient Intelligence. II”

Chair: K. Kutt

Co-Chair: G. Nalepa

- “GOAP in graph-based game narrative structures”
Paweł Węgrzyn, Iwona Grabska-Gradzińska, Ewa Grabska, Leszek Nowak
- “A Framework for Explanation-Aware Visualization and Adjudication in Object Detection: First Results and Perspectives”

- Session: SCAPC-II June, 7. 11:20—12:40 Room: C
“**Socio-Cognitive, Affective and Physiological Computing - II**”
Chair: F. de la Paz Co-Chair: A. Fernández- Caballero
 - “Human-Computer Interaction approach with Empathic Conversational Agent and Computer Vision” *Nuno Costa, Antonio Fernández-Caballero, Antonio Pereira, Rafael Pereira, Carla Mendes, Luís Frazão*
 - “Using touch to improve emotion recognition: proposed system and expert validation”
Luisa Merino Ramírez, José Pascual Molina, Félix de la Paz López, Antonio Fernández-Caballero, Álvaro Lanchas López, Arturo S. García

Social Program

Coffee break June 5, 6 and 7, from 11:00 am to 11:20 am. Served at the entrance of room A.

Lunch June 5 and 6, 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 Real Marina).

June 5, Wednesday

16:30 h. – **Presentation of the book “Cerebral Dynamics” of Dr. Justo Gonzalo**, at *Room A* in Hotel Real Marina.

20:00 h. – **Welcome reception and cocktail** served at the Hotel Real Marina pool on the second floor *Hotel Real Marina*.

June 6, Thursday

18:00 – 21:00 Sightseeing **excursion** to *Faro* (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 *Pousada Palácio de Estoi* (Pousada Palácio de Estoi: R. do Pe da Cruz 30, 8005-411 Estói, Portugal) Plus Code: [34W3+67 Estoi, Portugal](#)
Buses will depart from Congress Venue at 18:00h.

[34W3+67 Estoi, Portugal](#)

Congress Venue

HOTEL REAL MARINA

Av. 5 de Outubro, 8700-307 Olhão, Algarve (Portugal)

Portugal

Plus Code: [25F3+G4 Olhão, Portugal](#)

* 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 IWINAC/ICINAC2024. 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>](mailto:eventos.alc@bcdme.es)

Starting 15:30 h. [June 4](#), 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/ICINAC2024registrationform>



Congress URL <http://www.icinac.org/iwinac.org/iwinac2024>

Travel Information

[Faro International Airpor](#) (international code“FAO”) with flights from Spain, and many international airports is located 11km from the Congress venue, Olhao. Please, contact our [Technical Secretariat](#) (BCD m&e) for more detailed information on travel and accommodation.

[Olhao](#) known as Olhão da Restauração, is a city and municipality in the Algarve region of southern Portugal. Located near the regional capital Faro and forming a single urban agglomeration, it is a fishing port and tourist center. Along with Faro, Loulé and Tavira, Olhão forms a conurbation from the eastern and central Algarve. The Algarve is an area that presents a climate typically Mediterranean, characterized by warm and dry seasons during five months of the year, with median daily temperatures around 22.5 °C and gentle winters.

Interactive map of IWINAC/ICINAC2024 places: <https://v.gd/mapICINAC2024>

Currency, Banks and Tipping

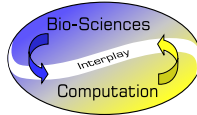
The monetary unit in Spain is the EURO (symbol €). The euro is divided into a hundred cents (symbol ¢). Coins: 1, 2, 5, 10, 20 and 50 cents; 1 and 2 euros. Banknotes: 5, 10, 20, 50, 100, 200 and 500 euros. Banknotes of 500 euros are usually only accepted at bank offices. The maximum cash payment allowed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



IWINAC/ICINAC2024



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Congress Venue:

HOTEL REAL MARINA

Olhao - Algarve (Portugal)

June 4 – June 7, 2024

<http://www.icinac.org/iwinac.org/iwinac2024>

