IWANN

PROGRAM

16-18 June, 2025

A Coruña, Spain

IWANN 2025 Short Program

NOTE: All **Sessions A** and **Sessions B** will be held in Hotel Meliá Maria Pita (A Coruña, Spain). They are **face-to-face sessions.** All **Sessions C** will be held on-line (virtual) using Zoom.

Monday, June 16th, 2025			
8:30-9:00	**REGISTRATION DESK** *(start at 8:30h but it is opened during all the conference)*		
9:00-10:45	**Session A.1: Deep Learning (I)**	**Session B.1: New and future advances in BCI-based Spellers**	
10:45-11:30	**COFFEE BREAK**		
11:30-12:30	**OPENING PLENARY LECTURE**		
12:30-14:00	**Session A.2: Deep Learning applied to Computer Vision, Healthcare and Robotics (I)**	**Session B.2: ITOMAD – Intelligent Techniques for Optimization, Modeling, and Anomaly Detection (I)**	**Session C.1: General Applications of AI (I)**
14:00-16:00	**LUNCH**		
16:00-17:10	**Session A.3: AI:Bioinformatics and Biomedical Applications**	**Session B.3: Advanced Topics in Computational Intelligence (I)**	**Session C.2: Deep Learning (Part II)**
17:10-17:40	**COFFEE BREAK**		
17:40-18:45	**Session A.4: Deep Learning (Part III)**	**Session B.4: Machine Learning for 4.0 Industry Solutions**	**Session C.3: Deep Learning (Part IV)**
18:45-19:45	**Session A/B-5. Poster Session/ Demo Session**		

Tuesday, June 17th, 2025			
8:30-9:00	REGISTRATION DESK *(start at 8:30h but it is opened during all the conference)*		
9:00-10:55	Session A.6: ANN HW-Accelerators	Session B.6: ITOMAD – Intelligent Techniques for Optimization, Modeling, and Anomaly Detection (II)	Session C.4: Advanced Topics in Computational Intelligence (II)
10:55-11:30	COFFEE BREAK		
11:30-12:30	PLENARY LECTURE		
12:30-14:15	Session A.7: Explainable and Interpretable Machine Learning (xAI) with a focus on applications	Session B.7: Advances in Machine Learning for Photovoltaic System Optimization and Control in Modern Energy Grids	Session C.5: Deep Learning applied to Computer Vision, Healthcare and Robotics (I)
14:15-16:00	LUNCH		
16:00-17:10	Session A.8: Deep Learning applied to Computer Vision, Healthcare and Robotics (II)	Session B. 8: Bio-Inspired Systems and Neuro-Engineering	Session C.6: General Applications of AI (II)
17:10-17:40	COFFEE BREAK		
17:40-18:45	Session A.9: Advances models in Time Series Forecasting		
20:15	Gala Dinner		

Wednesday, June 18th, 2025		
8:30-9:00	**REGISTRATION DESK** ***(start at 8:30h but it is opened during all the conference)***	
9:00-10:10	**Session A.10: General Applications of AI (III)**	**Session B. 9: Social and Ethical aspects of AI**
10:10-10:45	**COFFEE BREAK**	
10:45-11:45	**PLENARY LECTURE**	
11:50-13:30	**TUTORIAL:** **AI and Digital Twins in Healthcare: Synergies of Physics-informed Models and Machine Learning for Precision Medicine**	

NOTES:

- All **Sessions A** and **Sessions B** will be held in Hotel Meliá Maria Pita (A Coruña, Spain). They are **face-to-face sessions.** The **plenary lectures** are in **Session A.**
- All **Sessions C** will be held on-line (virtual) using Zoom.
- **Oral** Presentation: **20 minutes** (including questions). Depending on whether there are absent speakers, times may be adjusted.
- **Poster** authors are requested to place their posters on the panels before the start of the poster session (e.g. during the coffee break or lunch). It is recommended to use **A0 size** and large fonts.

IWANN 2025 PROGRAM

Monday, June 16th 2025

(9:00-10:45) Session A.1: Deep Learning (Part I)

Domain Adaptation of the Whisper ASR Model for Tourism Call Center Transcription in Polish **(Ref: *757*)**

Maria Bollin, Wojciech Meler, Jan Piesiewicz and Łukasz Rąbalski

Learning to Search with Subgoals **(Ref: *4993*)**

Petr Hyner, Jan Mrógala, Kryštof Krmaschek and Jan Hůla

Towards Speaker Independent Speech Emotion Recognition by means of Dataset Aggregation **(Ref: *5785*)**

Francisco Portal, Javier de Lope and Manuel Graña

Learning Heuristics for k-NANN-A*: A Deep Learning Approach **(Ref: *8132*)**

Enrique Aldao, Laura María Fernández Pardo, Fernando Veiga López, Caroline Ponzoni Carvalho Chanel, Yoko Watanabe and Higinio González Jorge

Evaluating Higher-Level and Symbolic Features in Deep Learning on Time Series: Towards Simpler Explainability **(Ref: *9365*)**

Leonid Schwenke, Till Stückemann and Martin Atzmueller

(9:00-10:45) Session B.1: New and future advances in BCI-based Spellers

Exploring Code-Modulated Visual Evoked Potentials Spellers in Realistic Scenarios **(Ref: *300*)**

Ana Martín-Fernández, Víctor Martínez-Cagigal, Selene Moreno-Calderón, Eduardo Santamaría-Vázquez, Beatriz Pascual-Roa and Roberto Hornero

Towards Secure Transaction Authentication Using a cVEP-Based BCI **(Ref: *1494*)**

Ayas Kiser, Atilla Cantürk and Ivan Volosyak

Evaluating Color Heterogeneity in RSVP-Based ERP-BCIs **(Ref: *4028*)**

Álvaro Fernández-Rodríguez, Mattieu Marchais, Lou Pépin, Lucas Sainte-Croix, Julia Zitouni-Flambard, Véronique Lespinet-Najib, Jean-Marc André and Ricardo Ron-Angevin

Graph-Attentive CNN for cVEP-BCI with Insights into Electrode Significance **(Ref: *4104*)**

Milan Andras Fodor and Ivan Volosyak

BCI with Intuitive Object Control based on Code-Modulated Visual Evoked Potentials **(Ref: *4673*)**

Hanneke A. Scheppink, Atilla Cantürk and Ivan Volosyak

Exploring the integration of c-VEP-based BCI spellers in mixed reality: a pilot study **(Ref: *7716*)**

Selene Moreno-Calderón, Víctor Martínez-Cagigal, Ana Martín-Fernández, Eduardo Santamaría-Vázquez, Beatriz Pascual-Roa and Roberto Hornero

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(11:30-12:30) Opening Plenary Talk: Prof. Barbara Hammer

Research Institute for Cognitive Interaction Technology (CITEC), Bielefeld University.

Title of the presentation: Harnessing the power of deep surrogate models

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(12:30-14:00) Session A.2: Deep Learning applied to Computer Vision, Healthcare and Robotics (Part I)

Knee osteoarthritis severity grading using soft labelling and ordinal classification **(Ref: *278*)**

Francisco Bérchez-Moreno, Victor M. Vargas, Antonio M. Gómez-Orellana, David Guijo-Rubio, Luca Romeo, Edoardo Conti, Pedro Antonio Gutierrez and César Hervás-Martínez

Hybrid dropout for deep ordinal classification **(Ref: *4395*)**

Francisco Bérchez-Moreno, Francisco Moreno-Cano, David Guijo-Rubio, Víctor M. Vargas, Pedro A. Gutierrez and César Hervás-Martínez

Enhanced video-based eye status detection in term infants **(Ref: *6690*)**

Nuria Velasco, Juan Arnaez, Álvaro Herrero, Nuño Basurto and Daniel Urda

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(12:30-14:00) Session B.2: ITOMAD – Intelligent Techniques for Optimization, Modeling, and Anomaly Detection

Design and Capture of a 5G SA Traffic Dataset Under Jamming Conditions **(Ref: *1829*)**

Diego Narciandi-Rodríguez, Guillermo Martínez-Martínez, José Aveleira Mata, Martín Bayón Gutiérrez, Javier Alfonso-Cendón and Isaias Garcia

Predicting TiO2 and FeO Concentrations in Lunar Regolith Using Machine Learning Models: A Spectral Reflectance Approach **(Ref: *6906*)**

Julia Fernández-Díaz, Francisco Javier de Cos Juez, Fernando Sánchez Lasheras, Javier Gracia Rodríguez, Santiago Iglesias, Javier Rodríguez, Saúl Pérez and Alejandro Buendía

Optimal malware mitigation in IoT networks: A comparative study of Neural ODEs and Pontryagin's maximum principle **(Ref: *6987*)**

Roberto Casado-Vara, Rafael Rodríguez García, Branly Martínez, Marta-María Álvarez-Crespo, Antonio Díaz-Longueira and Carlos Cambra

Study on the Impact of Low-Cost Sensor Alternatives for Photovoltaic Panel Modelling in Smart Grid Applications **(Ref: *9537*)**

Anabel Díaz-Labrador, Ángel Delgado, Héctor J.Pérez-Iglesias, Óscar Fontenla-Romero and Jose Luis Calvo-Rolle

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(12:30-14:15) Session C.1: General Applications of AI (I)

A Review of Machine Learning Applications in Film Industry: Trends, Techniques, and Future Directions **(Ref: *356*)**

Pratik Kalamkar and Dr. Yogesh Kumar Sharma

Empowering Scalable Fraud Detection Using Graph Neural Networks and Incremental Learning **(Ref: *1922*)**

Medabalimi Ravi Kumar, Nikhil Gumasthi, Kapil Sangani, Saurav Singla and Satyaprasad Rao

Transfer Learning approach for prediction of maximum wave height in two locations of the Bay of Biscay: Bilbao and Cabo de Peñas **(Ref: *3997*)**

J. David Nuñez-Gonzalez, Lucía Porlán Ferrando, Manuel Graña and Alain Ulazia Manterola

Classifier fusion for the detection of defects from active thermography **(Ref: *7526*)**

Addisson Salazar, Rocco Zito, Stefano Laureti, Marco Ricci and Luis Vergara

Multimodal analysis of neuropsychological tests from EEG and fMRI data **(Ref: *8561*)**

Addisson Salazar, Luis Vergara and Alberto González

(16:00-17:15) Session A.3: AI:Bioinformatics and Biomedical Applications

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A transformer-based model to predict micro RNA interactions **(Ref: *1566*)**

Marco Nicolini, Federico Stacchietti, Carlos Cano, Elena Casiraghi and Giorgio Valentini

Leveraging Large Language Models on Assay Descriptions to Improve the Prediction of Inhibitors for Mycobacterium tuberculosis **(Ref: *3145*)**

Nuno Alves, Nuno S. Osório, Vítor Pereira and Miguel Rocha

Advancing Imminent Fracture Risk Prediction: Integrating Machine Learning with Enhanced Feature Engineering **(Ref: *7730*)**

Mohammad Maghsoudimehrabani and Edward Sykes

Self-organizing Maps for Missing Value Imputation in Transcriptomic Datasets **(Ref: *8545*)**

Louzanne Swart and Andries Engelbrecht

(16:00-17:10) Session B.3: Advanced Topics in Computational Intelligence (I)

Incremental Feature Learning of Shallow Feedforward Regression Neural Networks using Particle Swarm Optimisation **(Ref: *6544*)**

Ross Naylor and Andries Engelbrecht

Resilience Under Attack: Benchmarking Optimizers Against Poisoning in Federated Learning for Image Classification Using CNN **(Ref: *7780*)**

Yohannes Biadgligne Ejigu, Yassine Baghoussi Baghoussi and Alípio Jorge

VIDEM: VIDeo Effectiveness and Memorability Dataset **(Ref: *9945*)**

Rukiye Savran Kızıltepe, Sohail Sahab, Rodrigo Valladares Santana, Faiyaz Doctor, Kate Paterson, David Hunstone and Alba García Seco de Herrera

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(16:00-17:10) Session C.2: Deep Learning (Part II)

Energy-Efficient Radio Resource Allocation in 5G Using Deep Q-Networks **(Ref: *1719*)**

David Fernández Martínez, Lorena Chinchilla Romero, Pablo Muñoz Luengo and Pablo Ameigeiras Gutiérrez

Multi-view Cross Contrastive Learning for Multimodal Knowledge Graph Recommendation **(Ref: *2151*)**

Zhong Liu, Zhengguang Liang, Minlong Huang, Tingjuan Li and Xiaoming Zhang

MuleTrack: A Lightweight Temporal Learning Framework for Money Mule Detection in Digital Payments **(Ref: *2460*)**

Ganesh Jambhrunkar, Harsh Sharma, Saurav Singla and Thirumalai Kailasam

Modular Deep Neural Networks with residual connections for predicting the pathogenicity of genetic variants in non coding genomic regions **(Ref: *7994*)**

Federico Stacchietti, Marco Nicolini, Leonardo Chimirri, Peter N. Robinson, Elena Casiraghi and Giorgio Valentini

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(17:45-19:05) Session A.4: Deep Learning (Part III)

Modeling Student–Subject Interactions with GNNs for Grade Prediction **(Ref: *3857*)**

Ghaidaa Ahmed-Ali, Jose Luis Avila-Jimenez, Mohammed Ibrahim Al-Twijri and Sebastián Ventura

Artificial intelligence model for the prediction of cleansing foam formulations with excellent make-up removability Is an “in silico formulator” superior to a human formulator? **(Ref: *5034*)**

Masugu Hamaguchi, Hideki Miwake, Ryouichi Nakatake and Noriyuki Arai

Deploying Vision Foundation AI Models on the Edge. The SAM2 Experience **(Ref: *9316*)**

Zheshuo Lin, Ruben Tous and Beatriz Otero

Generative AI for Contextualizing Bronze Age Objects in Historical Scenes **(Ref: *9588*)**
Mircea-Andrei Radu, Ionut-Cristian Calinescu, Nebojsa Bacanin, Leonard Ionescu, Lucian Popescu-Vava and Catalin Stoean

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(17:45-18:50) Session B.4: Machine Learning for 4.0 Industry Solutions

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Physics Informed Machine Learning for Power Flow Analysis: Injecting Knowledge via Pre-, In-, and Post-Processing **(Ref: *4303*)**
Guido Parodi, Giulio Ferro, Michela Robba, Andrea Coraddu, Francesca Cipollini, Davide Anguita and Luca Oneto

Dimensionality Reduction and Outlier Analysis for the NF-ToN-IoT Cybersecurity Dataset **(Ref: *6977*)**
Angel Arroyo, Diego Granados, Félix de Miguel, Nuria Velasco and Álvaro Herrero

Smart Incident Prediction from NOC Alert Events in Digital TV Broadcasting Networks **(Ref: *7899*)**
Francisco Javier González-Serrano, Lorena Álvarez-Pérez, Harold Y. Molina-Bulla and Marcelino Lázaro

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(17:45-18:50) Session C.3: Deep Learning (Part IV)

G-TED SAM: Node Classification via Graph Transformer to Simple Attention Model Distillation **(Ref: *2540*)**
Aditya Mathur, Nikhil Gumasthi, Kapil Sangani, Shriram Ankitha, Mohit Agrawal, Satyaprasad Rao, Medabalimi Ravi Kumar and Saurav Singla

Expression Recognition in Faces Partially Occluded by Head-Mounted Displays **(Ref: *4546*)**
José Luis Gómez-Sirvent, Francisco López de la Rosa, Roberto Sanchez Reolid and Antonio Fernández-Caballero

Reinforcement Learning for Mapless Navigation: Enhancing Exploration with Image-Based Rewards **(Ref: *8616*)**
Vernon Kok, Absalom Ezugwu and Michael Olusanya

(18:50-20:00) Session A/B.5: Poster Session/Demo Session

Hardware and Software influence on EAs power consumption **(Ref: *195*)**

Josefa Díaz-Álvarez, Maribel García Arenas, Abel Sánchez Venegas, Gustavo Romero López, Francisco Fernández de Vega and Pedro Castillo Valdivieso

AEROFER: An aeroponics demonstration project **(Ref: *405*)**

Marta Musté, Xavier Parra, Marga López, Núria Jiménez and Elsa Pérez

A Self-Supervised Transfer Learning Approach for Collision Cross Section Prediction **(Ref: *586*)**

Guillermo Ramajo Fernández, Constantino García, Alberto Gil-de-la-Fuente, Víctor González-Ruiz and Abraham Otero

Quantitative and qualitative evaluation on local explainability models for anomaly detection algorithms **(Ref: *1935*)**

David Esteban-Martínez, Carlos Eiras Franco, Bertha Guijarro-Berdiñas and Amparo Alonso-Betanzos

An event-related potential BCI speller using a wearable, single-channel EEG headset with electrodes on the forehead **(Ref: *2716*)**

Arne Van Den Kerchove, Mani Mirsaeedi, Bob Van Dyck and Marc M. Van Hulle

Specialized Electronics for Electrochemical Impedance Spectroscopy of Zinc-Air Batteries **(Ref: *3446*)**

Felix Winters, Jan-Ole Thranow, Andre Löchte, Markus Gregor and Peter Glösekötter

Power Quality 24-hour Prediction Based on L-Transform Derivative Modular and Deep Learning Statistics Using Environmental Data in detached Smart Buildings **(Ref: *4034*)**

Ladislav Zjavka and Václav Snášel

Trustworthy AI Benchmark for Responsible Smart Grid as Critical Infrastructure **(Ref: *4380*)**

Federico Grasso Toro and Guglielmo Frigo

Machine learning-based surrogate models for atmospheric pollutant dispersion prediction: a comparative analysis Between conventional and alternative fuels **(Ref: *5330*)**

Omar Hassani, Moisès Graells, Eva Gallego and José Francisco Perales

A Novel q-Rung Orthopair Hesitant Fuzzy Aggregation Approach for Multicriteria Group Decision Making: Application to Electric Vehicle Charging Station Selection in Kolkata, India **(Ref: *5786*)**

Arun Sarkar

Physics-Informed Deep Learning Approach for Reintroducing Atomic Detail in Coarse-Grained Configurations of Multiple Poly(lactic acid) Stereoisomers **(Ref: *5963*)**

Eleftherios Christofi, Petra Bačová and Vagelis Harmandaris

A Framework for Controlling NV Centers with OPX+: Design, Implementation, and Applications **(Ref: *7215*)**

David Ahlmer, Jan Meijer, Peter Glösekötter and Bernd Burchard

Data-Driven All-Optical Magnetometry: A Comparative Evaluation of Regression Models Using NV Center Fluorescence Lifetimes **(Ref: *7687*)**

José Luis Ávila-Jiménez, Ann-Sophie Bülter, Ludwig Horsthemke, Francisco Javier Rodríguez Lozano, Manuel Agustín Ortiz López and Peter Glösekötter

A Transformer-Based Deep Learning Framework for Battery Aging Characterization, Synthetic Data Generation, and Real-Time Parameter Adaptation **(Ref: *7952*)**

Carlos Cano, Manuel Soler Ortiz, David Modesto, Anas Belfadil, Ruxandra Stoean and Joan Farnós

Mathematical and theoretical methods in computational intelligence **(Ref: *8187*)**

Saeid Karimi

Assessment of biowaste composting process for industrial support tool development through macro data approach **(Ref: *8304*)**

Cecilia Giron-Rojas, Emilio Gil, Albert García-Ruíz, Noemí Iglesias and Marga López

Machine Learning based Screening for Psychological Distress using a Perceived Control Mobile App **(Ref: *8863*)**

Prosper Azaglo, Pepijn van de Ven and John Nelson

Tobacco and Weed Segmentation from Remote Images Using Artificial Intelligence **(Ref: *9232*)**

Alexandru Bunica-Mihai, Loretta Ichim and Dan Popescu

Bio-inspired Systems and Neuro-engineering: Bridging Biology and Technology **(Ref: *9265*)**

Mehrzad Mohammadian

A Hybrid ResNet50-LSTM Architecture for Video Sentiment Analysis **(Ref: *9342*)**
Radu Marian Macovei, Dan Popescu and Loretta Ichim

Towards a Framework that facilitates the Construction of Image Segmentation Models **(Ref: *9713*)**
Joaquín Ortíz de Murua, Cesar Dominguez, Jónathan Heras and Vico Pascual

TASER-Net: Transformer Based Speech Emotion Recognition **(Ref: *9880*)**
M Srinivas, U Shivani Sri Varshini, Pradumya Kumar and Jenni K

Experimental Analysis and Modeling of Electrochemical Oxygen Pump Cell ECOpump **(Ref: *9895*)**
Ivan Kolesnikov, Nils Höing, Peter Glösekötter and Tilman Sanders

Tuesday, June 17th, 2025

(9:00-10:55) Session A.6: ANN HW-Accelerators

RECS: A Scalable Platform for Heterogeneous AI Acceleration in the Cloud-Edge Continuum **(Ref: *687*)**

René Griessl, Florian Porrmann, Kevin Mika, Lennart Tigges and Jens Hagemeyer

Evaluating HBM to accelerate neural networks on FPGAs demonstrated using binary neural associative memories **(Ref: *1376*)**

Florian Porrmann, Sarah Pilz, Jens Hagemeyer and Ulrich Rückert

Resource-efficient Implementation of Convolutional Neural Networks on FPGAs with STANN **(Ref: *3410*)**

Yu Li, Marc Rothmann and Mario Porrmann

High-Performance FPGA-based CNN Acceleration for Real-Time DC Arc Fault Detection **(Ref: *7200*)**

Yu Li, Yufei Mao, Roland Weiss and Mario Porrmann

Optimizing AI on the Edge: Partitioning Neural Networks Across Heterogeneous Accelerators **(Ref: *7698*)**

Kevin Mika, Nils Kucza, Florian Porrmann and Jens Hagemeyer

Comparison of Hardware Component and Manycore Implementation for Anomaly Detection in Trustworthy System-on-Chips **(Ref: *9864*)**

Martin Flasskamp, Christian Klarhorst and Jens Hagemeyer

(9:00-10:55) Session B.6: ITOMAD – Intelligent Techniques for Optimization, Modeling, and Anomaly Detection (II)

A Short Analysis of Hybrid Frameworks Based on Self-Organizing Maps to Improve Traditional Systems **(Ref: *2569*)**

Dragan Simić, José Luis Calvo-Rolle, José R. Villar, Svetislav D. Simić and Svetlana Simić

Comparative Performance of Convolutional Neural Networks and Vision Transformers for Quality Assurance of a Welding Process **(Ref: *2936*)**

Paula Arcano-Bea, Agustín García-Fischer, Manuel Rubiños, Pablo Fariñas Alvariño, Francisco Zayas-Gato and Jose Luis Calvo-Rolle

A Novel Indicator for Nitrogen Prediction in Wastewater Treatment Plants. Implementation of Intelligent Agent-Based **(Ref: *3935*)**

Miriam Timiraos, Emilio Lima Bullones, Alejandro Vidal-Bralo, José-Luis Casteleiro-Roca and José Luis Calvo-Rolle

Power Prediction System for Photovoltaic Panels Using Artificial Intelligence **(Ref: *4720*)**

Noel Freire-Mahía, Álvaro Michelena, Antonio Díaz-Longueira, Héctor Quintián and Esteban Jove

Towards safer hydrogen infrastructure: anomaly detection in synthetic hydrogen dispensing data **(Ref: *7196*)**

Nuria Velasco, Félix de Miguel, Carolina Gutiérrez, David García, Luis Miguel Lozano, Daniel Urda and Álvaro Herrero

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(9:00-10:00) Session C.4: Advanced Topics in Computational Intelligence (II)

Penetration Testing with AI: Case Studies on LLM and RL-Based Attack Agents **(Ref: *3559*)**

Rui Fernandes, Nuno Lopes and Joaquim Gonçalves

A comparative study of deep learning approaches for classifying wild and cultivated fish **(Ref: *4287*)**

Mario Jerez Tallon, Ismael Bevia Ballesteros, Nahuel Garcia D'Urso, Andrés Fuster Guillo, Jorge Azorin Lopez and Kilian Toledo Guedes

Sparse Least Square SVM in Primal via Nesterov Accelerated Alternating Directions Method of Multipliers **(Ref: *6994*)**

Felipe Marinho, Wellington de Almeida, Victor Santos, Ajalmar Neto and Paulo Ricardo Bernardo Silva

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(12:30-13:30) Plenary Talk: Prof. Gustavo Deco

Institució Catalana de Recerca i Estudis Avançats / Pompeu Fabra University.

Title of the presentation: The Thermodynamics of Mind

(12:30-14:15) Session A.7: Explainable and Interpretable Machine Learning (xAI) with a focus on applications

Understanding of Latent spaces in a battery aging prediction model through eXplainable AI **(Ref: *1760*)**

Carlos Cano, Manuel Soler Ortiz, David Modesto, Anas Belfadil, Ruxandra Stoean and Joan Farnos

Exploring brain lateralization using Tensor decomposition of EEG phase-amplitude coupling **(Ref: *1798*)**

Andres Ortiz, Nicolás Gallego-Molina, Ignacio Rodriguez-Rodriguez, Alberto Peinado, Maria Dolores Gil-Montoya, Pablo Martinez-Cañada and Christian Morillas

Decoding Mental States in Social Cognition: Insights from Explainable Artificial Intelligence on HCP fMRI Data **(Ref: *7721*)**

Jose Diogo Marques dos Santos, Luis Paulo Reis and Jose Paulo Marques dos Santos

Kolmogorov-Arnold Networks for the Development of Intrusion Detection Systems **(Ref: *7935*)**

Pablo González Santamarta

Ethical Considerations in Artificial Intelligence and Machine Learning **(Ref: *7136*)**

Rita Lino, Fernando Alves and Manuel Rodrigues

(12:30-14:15) Session B.7: Advances in Machine Learning for Photovoltaic System Optimization and Control in Modern Energy Grids

Symmetrical Magnetic Field Reconstruction for Sector-shaped Multi-Wire Cables using Machine Learning **(Ref: *3990*)**

Ariana-Andra Șerpar, Ruxandra Stoean, Carlos Cano Domingo, Ignacio Rojas Ruiz, Peter Glösekötter and Jens Pogorzelski

Comparison of Multiclass Classification on Impedance Spectra to Estimate the State of Charge of Zinc-Air Batteries **(Ref: *5390*)**

Jan-Ole Thranow, Andre Löchte, Felix Winters, Markus Gregor and Peter Glösekötter

Computational Approaches for Resolving the Low-Field Ambiguity in All-Optical Magnetic Field Sensing With NV Centers **(Ref: *9565*)**

Ann-Sophie Bülter, Ludwig Horsthemke, José Luis Ávila-Jiménez, Frederik Hoffmann, Francisco Javier Rodriguez-Lozano, Sarah Kirschke, Tilman Sanders, Markus Gregor and Peter Glösekötter

Edge Machine Learning for All-Optical Fluorescence Lifetime-Based Sensing With NV Centers **(Ref: *5956*)**

Ludwig Horsthemke, Ann-Sophie Bülter, Jens Pogorzelski, Dennis Stiegekötter, Frederik Hoffmann, José Luis Ávila-Jiménez, Markus Gregor and Peter Glösekötter

Evaluating LSTM Model Performance for Solar Energy Prediction Using Real vs. Forecasted Exogenous Weather Data **(Ref: *7811*)**

Alexandru-Adrian Ciobanu, Nebojsa Bacanin and Catalin Stoean

(12:30-14:25) Session C.5: Deep Learning applied to Computer Vision, Healthcare and Robotics (I)

Self-attentive bidirectional LSTM networks for temporal decoding of EEG motor states **(Ref: *2223*)**

Sara Kamali, Fabiano Baroni and Pablo Varona

Improving Coffee Disease detection using Faster R-CNN framework **(Ref: *3680*)**

Nameer Baht, Enrique Dom'Inguez and Basil Hasan

Human Activity Recognition in the Classroom using Low-cost Sensors **(Ref: *3367*)**

Sergio Suescun-Ferrandiz, Miguel Cazorla and Francisco Gomez-Donoso

Effects of Grouped Structural Global Pruning of Vision Transformers on Domain Generalisation **(Ref: *8169*)**

Hamza Riaz and Alan Smeaton

MORENA: Empty images detection based on unsupervised reconstruction error analysis **(Ref: *8613*)**

David de la Rosa, María José del Jesus, María Dolores Pérez-Godoy and Francisco Charte

Methodological framework for the creation of digital twins for photovoltaic power plants **(Ref: *9578*)**

Anibal Mantilla, Jorge Azorin-Lopez and Jose Garcia Rodriguez

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(16:00-17:10) Session A.8: Deep Learning applied to Computer Vision, Healthcare and Robotics (II)

Bone Fracture Recognition using Robust Deep Learning Techniques **(Ref: *958*)**

Samson Akinpelu and Serestina Viriri

ThermoCycleNet: Stereo-based Thermogram Labeling for Model Transition to Cycling **(Ref: *7253*)**

Daniel Andrés López, Vincent Weber, Severin Zentgraf, Barlo Hillen, Perikles Simon and Elmar Schömer

Decoding Brain Lobe Contributions in EEG for automatic detection of obstructive sleep apnea **(Ref: *7357*)**

Jonathan Quintuña and Vinicio Changoluisa

(16:00-17:10) Session B.8: Bio-Inspired Systems and Neuro-Engineering

An Emotional Classifier for Machine's Artificial Visual Aesthetic Appraisal **(Ref: *116*)**

Fatemeh Saveh, Mohand Tahar Soualah, Kurosh Madani and Abdennasser Chebira

Properties of monoclinic gallium oxide film and its photomemristor application in nonlinear RMC circuit **(Ref: *2909*)**

Marina Sparvoli, Ronaldo Mansano, Fábio Jorge, Daniel Fidelis, Gilson Goveia, Cleber Rodrigues, Tiago Silva, Antônio Ferreira Da Silva, Jaime Freitas, Henrique Gulino, Gustavo Pedretti and José Chubaci

A perceptron-like neural network implementing a learning-capable K-nearest neighbor classifier **(Ref: *3751*)**

Alexander Goltsev and Oleksii Holtsev

From Biological Neurons to Artificial Neural Networks: A Bioinspired Training Alternative **(Ref: *3946*)**

Alberto Fernandez-Sanchez, Marcos Gestal, Julián Dorado and Alejandro Pazos

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(16:00-18:00) Session C.6: General Applications of AI (II)

Solid-waste Classification Using Deep Learning Fusion Model **(Ref: *3661*)**

Tinh Pham and Minh Le

Improving PV power prediction based on GRU and meteorological factors **(Ref: *4123*)**

Myriam Cumbajin, Ruxandra Stoean, Jose Aguado and Gonzalo Joya

Poisson Hamiltonian Neural Networks: Structure-Preserving Learning of Dynamical Systems **(Ref: *6817*)**

Adérito Araújo, Gonçalo Oliveira and João Nuno Mestre

SEF-Net: A Hybrid Deep Learning Architecture for Multi-Step Forecasting in Sustainable Energy Markets **(Ref: *8349*)**

Frédéric Mirindi and Derrick Mirindi

A new approach to detecting occupational diseases using time series **(Ref: *9990*)**

Antonio Díaz-Longueira, Noel Freire-Mahía, Oscar Fontenla-Romero and José Luis Calvo-Rolle

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(17:45-19:30) Session A.9: Advances models in Time Series Forecasting

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Assessing bias in the evaluation of blood glucose prediction models **(Ref: *9402*)**

Ciro Rodriguez-Leon, Maria Dolores Aviles, Oresti Banos, Pablo Lopez-Ibarra, Manuel Munoz-Torres, Miguel Quesada-Charneco and Claudia Villalonga

Prediction of osteoporosis and Learning of Neural Network with Optimal Control Tools **(Ref: *552*)**

Andrzej Nowakowski, Piotr Fulmanski and Marta Lipnicka

Forecasting Non-Stationary Time Series: A Comparison of Deep and Shallow Neural Network Architectures **(Ref: *2010*)**

Takudzwa Masunungure and Andries Engelbrecht

Analyzing the Limitations of Tree-Based Models for Multivariate Time Series Forecasting **(Ref: *2258*)**
Pablo Reina-Jiménez, María Martínez-Ballesteros and José C. Riquelme

Hybrid AI Models for Structured Mobility Prediction in Metropolitan Areas **(Ref: *2400*)**
Adrian M.P. Brasoveanu, Lyndon J.B. Nixon and Arno Scharl

XAI for univariate and multivariate time series forecasting. A case study on electricity consumption in Romania's National Electricity Network **(Ref: *3899*)**
Bogdan Marian Diaconu and Luminita Georgeta Popescu

Wednesday, June 18th, 2025

(9:00-10:10) Session A.10: General Applications of AI (III)

Tackling Missing Data Head-On: Strategies to Mitigate Survival and Confirmation Bias **(Ref: *94*)**
Mario Villaizán-Vallelado, Matteo Salvatori, Belén Carro Martinez and Antonio Sánchez Esguevillas

A Pragmatic Framework for In-House AI Recommender Systems in Digital Coaching **(Ref: *5147*)**
Heydar Khadem, Markel Vigo, John Keane and Xiao-Jun Zeng

Improved Post Processing Model for Photovoltaic Power Forecasting based on Clustering **(Ref: *9580*)**
Angellina Ebenezer Anitha, Katrin Handel, Katrin Schulte and Jens Haubrock

Comparative Analysis of Spiking Neurons Mathematical Models Training using Surrogate Gradients Techniques **(Ref: *9881*)**
Abdelkader Haddag, Elisa Guerrero Vazquez, Hayat Yedjour and Maria de La Paz Guerrero Lebrero

(9:00-10:00) Session B.9: Social and Ethical aspects of AI

Bias and Fairness in NLP: Addressing Social and Cultural Biases **(Ref: *4148*)**
Sattam Almatarneh, Ghassan Samara, Ahmed Banimustafa and Raed Alazaidah

TextNet: End-to-End Deep Learning Framework for Dynamic and Contextually Aware Text Clustering **(Ref: *5777*)**
U Shivani Sri Varshini, K Jenni and M Srinivas

Implications of Human+Machine Systems as Critical Infrastructures under Sustainable Development Goals **(Ref: *8060*)**
Federico Grasso Toro and Javier Bolaños

(10:45-11:45) Plenary Talk: Prof. Julià Camps

University of Oxford.

Title of the presentation: AI and Digital Twins in Healthcare: Synergies of Physics-informed Models and Machine Learning for Precision Medicine

(11:50-13:30) Tutorial

Practical Tutorial. Julià Camps, University of Oxford

AI and Digital Twins in Healthcare: Synergies of Physics-informed Models and Machine Learning for Precision Medicine.

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