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Nota di contenuto	-- Explainable and Interpretable Machine Learning (xAI) with a Focus on Applications. -- Understanding of Latent spaces in a battery aging prediction model through eXplainable AI. -- Exploring brain lateralization using Tensor decomposition of EEG phase-amplitude coupling. -- Ethical Considerations in Artificial Intelligence and Machine Learning. -- Kolmogorov-Arnold Networks for the Development of Intrusion Detection Systems. -- General Applications of AI. -- Machine Learning based Screening for Psychological Distress using a Perceived Control Mobile App. -- Tobacco and Weed Segmentation from Remote Images Using Artificial Intelligence. -- A Hybrid ResNet50-LSTM Architecture for Video Sentiment Analysis. -- Towards a Framework that facilitates the Construction of Image Segmentation Models. -- TASER-Net: Transformer Based Speech Emotion Recognition. -- Experimental Analysis and Modeling of Electrochemical Oxygen Pump Cell ECOpump. -- Empowering Scalable Fraud Detection Using Graph Neural Networks and Incremental Learning. -- Transfer Learning approach for prediction of maximum wave height in two locations of the Bay of Biscay: Bilbao and Cabo de Peñas. -- Classifier fusion for the detection of defects from active thermography. -- Multimodal analysis of neuropsychological tests

from EEG and fMRI data. -- Solid-waste Classification Using Deep Learning Fusion Model. -- Improving PV power prediction based on GRU and meteorological factors. -- Poisson Hamiltonian Neural Networks: Structure-Preserving Learning of Dynamical Systems. -- SEF-Net: A Hybrid Deep Learning Architecture for Multi-Step Forecasting in Sustainable Energy Markets. -- A new approach to detecting occupational diseases using time series. -- Comparative Analysis of Spiking Neurons Mathematical Models Training using Surrogate Gradients Techniques. -- ITOMAD – Intelligent Techniques for Optimization, Modeling, and Anomaly Detection. -- Design and Capture of a 5G SA Traffic Dataset Under Jamming Conditions. -- Predicting TiO<sub>2</sub> and FeO Concentrations in Lunar Regolith Using Machine Learning Models: A Spectral Reflectance Approach. -- Optimal malware mitigation in IoT networks: A comparative study of Neural ODEs and Pontryagin's maximum principle. -- Study on the Impact of Low-Cost Sensor Alternatives for Photovoltaic Panel Modelling in Smart Grid Applications. -- A Short Analysis of Hybrid Frameworks Based on Self-Organizing Maps to Improve Traditional Systems. -- Comparative Performance of Convolutional Neural Networks and Vision Transformers for Quality Assurance of a Welding Process. -- A Novel Indicator for Nitrogen Prediction in Wastewater Treatment Plants. Implementation of Intelligent Agent-Based. -- Power Prediction System for Photovoltaic Panels Using Artificial Intelligence. -- Towards safer hydrogen infrastructure: anomaly detection in synthetic hydrogen dispensing data. -- Machine Learning for 4.0 Industry Solutions. -- Physics Informed Machine Learning for Power Flow Analysis: Injecting Knowledge via Pre-, In-, and Post-Processing. -- Dimensionality Reduction and Outlier Analysis for the NF-ToN-IoT Cybersecurity Dataset. -- Data-Driven All-Optical Magnetometry: A Comparative Evaluation of Regression Models Using NV Center Fluorescence Lifetimes. -- Smart Incident Prediction from NOC Alert Events in Digital TV Broadcasting Networks. -- Machine Learning for Photovoltaic System Optimization and Control in Modern Energy Grids. -- Symmetrical Current Flow Reconstruction for Sector-shaped Multi-Wire Cables using Machine Learning. -- Comparison of Multiclass Classification on Impedance Spectra to Estimate the State of Charge of Zinc-Air Batteries. -- Edge Machine Learning for All-Optical Fluorescence Lifetime-Based Sensing With NV Centers. -- Evaluating LSTM Model Performance for Solar Energy Prediction Using Real vs. Forecasted Exogenous Weather Data. -- Computational Approaches for Resolving the Low-Field Ambiguity in All-Optical Magnetic Field Sensing With NV Centers. -- Improved Post Processing Model for Photovoltaic Power Forecasting based on Clustering. -- New and future advances in BCI-based Spellers. -- An event-related potential BCI speller using a wearable, single-channel EEG headset with electrodes on the forehead. -- A Framework for Controlling NV Centers with OPX+: Design, Implementation, and Applications. -- Exploring Code-Modulated Visual Evoked Potentials Spellers in Realistic Scenarios. -- Towards Secure Transaction Authentication Using a cVEP-Based BCI. -- Evaluating Color Heterogeneity in RSVP-Based ERP-BCIs. -- Graph-Attentive CNN for cVEP-BCI with Insights into Electrode Significance. -- BCI with Intuitive Object Control based on Code-Modulated Visual Evoked Potentials. -- Exploring the integration of c-VEP-based BCI spellers in mixed reality: a pilot study. -- Social and Ethical aspects of AI. -- Quantitative and qualitative evaluation on local explainability models for anomaly detection algorithms. -- Bias and Fairness in NLP: Addressing Social and Cultural Biases. -- Trustworthy AI Benchmark for Responsible Smart Grid as Critical Infrastructure. -- TextNet: End-

to-End Deep Learning Framework for Dynamic and Contextually Aware Text Clustering. -- Implications of Human+Machine Systems as Critical Infrastructures under Sustainable Development Goals.

Sommario/riassunto

The two-volume set LNCS 16008 & 16009 constitutes the refereed conference proceedings of the 18th International Work-Conference on Advances in Computational Intelligence, IWANN 2025, held in A Coruña, Spain, during June 16–18, 2025. The 103 revised full papers presented in these proceedings were carefully reviewed and selected from 144 submissions. The papers are organized in the following topical sections: Part I: Advanced Topics in Computational Intelligence; AI:Bioinformatics and Biomedical Applications; ANN HW-Accelerators; Bio-Inspired Systems and Neuro-Engineering; Recent Advances in Deep Learning; Deep Learning Applied to Computer Vision, Healthcare and Robotics; and Emerging Methodologies in Time Series Forecasting. Part II: Explainable and Interpretable Machine Learning (xAI) with a Focus on Applications; General Applications of AI; ITOMAD – Intelligent Techniques for Optimization, Modeling, and Anomaly Detection; Machine Learning for 4.0 Industry Solutions; Machine Learning for Photovoltaic System Optimization and Control in Modern Energy Grids; New and future advances in BCI-based Spellers; and Social and Ethical aspects of AI.