



ICAIREs 2026

International Conference on Artificial Intelligence and Renewable Energetic Systems

24–26 October 2026 · Tipasa, Algeria · icaires.com · Proceedings with Springer Nature



Keynote Speakers **SATURDAY 24 October, 2026 9h30-11h30**

Moderator Chair: Prof. Cherif BENOUDJAFER (Univ. Bechar, Alg.)

Speaker	Affiliation	Keynote title
Pr. Mouloud DENAÏ	ESGEE, Oran (Algeria)	Emerging Energy Storage Technologies and Applications
Pr. Alessio ANSUINI	AREA Science Park, Research and Technology Institute (Italy)	From Representations to World Models: Building AI-Ready Abstractions for Complex Systems
Pr. Nassim BOUDAUD	Université de Technologie de Compiègne – UTC (France)	Multimodal AI for Industrial Anomaly Detection and Predictive Maintenance

Oral Sessions **SUNDAY October 25, 2026 9h30-16h30**

Moderator Chair: Dr. Zoubir BELGROUN & Dr. Mustapha HATTI (UDES, Alg.)

01. AI & Edge Computing for PV Systems Monitoring & Fault Diagnosis Chairs: Prof. Adel MELLIT (Univ. Jijel); Dr. Nouamen KELLIL (UDES/EPST-CDER)

ID	Title	Author
10	XAIFDPV: Explainable AI for fault diagnosis of photovoltaic module based on IR thermal images	CHEKIROU Rokia
66	Embedded edge machine learning on smartphones for real-time photovoltaic module fault detection and classification	MOUSSAOUI Chourouk
125	Comparative Evaluation of ANN and Large Language Models for Real-Time AC Power Estimation in IoT-Based Photovoltaic Systems	ABDERRAHMANE Saad
158	A mini review on the AI applications for Sustainable Monitoring of Rotating Industrial Machines	CHAOUCH Aya

02. Advanced Control, Reconfiguration, and MPPT Strategies in Solar Energy Chairs: Prof. Abdelghani HARRAG (Univ. Setif); Dr. Merzak FERROUKHI (USTHB, Algiers)

ID	Title	Author
84	How to Operate MPPT Power Controllers for Photovoltaic Solar Systems	ZAQUI Ahmed
145	Hybrid Sudoku–GA–PSO Reconfiguration Strategy for Enhanced Power Extraction in Photovoltaic Arrays under Partial Shading Conditions	AREZKI Saliha
151	Digital Twin Technology Applied to Space Solar Cells	ACHOURI Mohamed Malik

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ID	Title	Author
85	AIST: AIC-Informed Spatial Transformer for P-wave First-Arrival Picking in CO2 Crosshole Seismic Monitoring	KHRAIMECH Amina

03. Smart Microgrids, Energy Management, and Predictive Analytics *Chairs : Prof. Abdelghani AISSAOUI (Univ.Bechar, Alg.) ; Prof. Nassim BOUDAOU (Univ.T.Campièrene. Fr.)*

ID	Title	Author
78	Development of a Real-Time Forecasting Platform for Energy Demand and Renewable Production in Electric Microgrids	KHEITER Amel
107	Integrating Behavioral Framing into an AI-Assisted Decision Support System for Energy Subsidy Reform	BOULAHBEL Samira
64	Statistical winners are not economic winners: loss-function dependence in daily energy commodity volatility forecasting	GUELLIL Mohammed Seghir
24	Smart City Automation and Prediction Using IoT and Artificial Intelligence	DJABALI Chabane
45	Analysis of Dispersion Compensation Performance in Optical Communication Systems Using Chirped Fiber Bragg Grating of Different Lengths	Hadjira HAMADOUCHE

04. Lightweight AI, Deep Learning Models, and Applied Sensing *Chair: Prof. Dalila CHERIFI (UMB Boumerdes, Alg.); Prof. Alessio ANSUINI (AREA Science Park, Ita.)*

ID	Title	Author
40	Attention Mechanisms in Lightweight 1D CNNs for Wearable HAR: A Rigorous Subject-Independent Ablation Study	HAMEG Zineddine
156	Post-Training Quantization for Efficient Deployment of Lightweight CNNs	SAIFI Salma
148	NitroDQN: An Interpretable Deep Reinforcement Learning Framework for Precision Nitrogen Management	AMIRAT Lina
99	Algerian license plate detection and recognition system for smart transportation (P)	BOUKERMA Hanane
71	AI-Based Multi-Fault Diagnosis of IPMSM Drives for Renewable Energy Systems Using Speed-Normalized Wavelet Features and Deep Q-Network Classification	GUERMIT Hossine

Poster Sessions

SATURDAY 24 October 2026. 11h30-13h00

Moderator Chair: Prof. Youcef SOUFI (Univ. Tebessa, Alg.)

P1. Hybrid Renewable Energy Systems, Storage, and Microgrid Optimization

Chairs: Dr. Fethi AKEL (UDES/CDER, Tipasa); Dr. Saliha AREZKI (USTHB, Alg.)

ID	Title	Author
11	Energy Efficiency Optimization in UAV-Assisted Wireless Networks: Concepts and Methodological Approaches	MACHER Yasmina
56	Advanced Energy Management of a Hybrid Renewable Power System Integrating PV, Wind, and Battery Storage with a Three-Level Converter	KOULALI Mostefa

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ID	Title	Author
44	Fuzzy-AI supervised backstepping control of a supercapacitor-assisted PV-wind-battery system based on a flying capacitor inverter	BOUMEDIENE Bachir
160	Comparative Study of Particle Swarm Optimization and Ant Colony Optimization for Optimal Sizing of a Microgrid system in Djanet, Algeria	FELLAHI Imad
79	Safety-Constrained Deep Reinforcement Learning for Energy Management in Off-Grid Telecommunication Microgrids	DJEDOUANI Nada

P2. Advanced Materials, Physics-Based Devices, and Photovoltaic Technologies *Chairs: Dr. Mohamed AYAD (UDES/EPST-CDER); Dr. Sabri BOULOUMA (UDES/EPST-CDER)*

ID	Title	Author
134	Modeling and Intelligent Optimization of CuO-Based Transparent Conducting Oxides for Smart Photovoltaic Applications	BOUGHAROUAT Ali
143	Physics-Based TCAD Optimization of III–V Tandem Concentrator Solar Cells for Next-Generation Photovoltaics	BENZEGHDA Sabah
06	Simulation and Performance Analysis of Hybrid PSO-P&O MPPT Algorithm with Hexagonal-Spiral Solar Panel Distribution	BENYAHIA Mohammed Yacine
7	A Comparative Study of Gaussian Process and Deep Kernel Learning for Wind Power Forecasting	BENKHOULA Hacene

P3. IoT Platforms, Smart Agriculture, and Industrial Reliability *Chairs: Prof. Younes CHIBA; Prof. Mounir BOUHEDDA (Univ. Medea)*

ID	Title	Author
29	Experimental Implementation of an IoT-Based Smart Building Using the Tahoma Platform	ROUIBAH Nassir
118	Intelligent Irrigation Management Platform Based on IoT, Artificial Intelligence, and Renewable Solar Energy	BAOUCHE Fatima Zohra
163	Fault Detection in Wind Turbine Gear Based on Ensemble Local Means Decomposition and Fast Kurtogram Analysis of Vibration Measurements	GRABSIA Naima
166	Finite Element Method Investigation of Inclined Defects in Pipelines and Their Repair Using Single and Double Patches	HOUCHE Islam

P4. Energy and IoT Applications *Chairs: Prof. Emerit. Fateh KRIM (Univ. Setif); Mr. Kheireddine MERHOUM (UMB Boumerdès, Alg.)*

ID	Title	Author
139	Analysis of the Energy Performance of a Wind Turbine for Use (Saharan and High Plateaus) in Algeria	SAADAoui Farid
176	An ESP32-S3-based IoT system for Real-Time Photovoltaic Monitoring and threshold-based Fault Detection with Platform Supervision	ZITOUNI Melissa
177	An IoT-Enabled Universal Platform Based on ESP32 and XBee for Reliable Monitoring and Communication Evaluation	HAMLAoui Abdennour
104	Modeling, Sizing, and SOC-Based Energy Management of a Fuel Cell–Battery Hybrid Electric Vehicle Using Python Simulation	RAHMANI Mohamed

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Special Sessions

SATURDAY 24 October 2026. 14h30-16h30

SS2. Smart Transportation, VANET Security and Smart Cities *Chairs: Dr. Mouloud KHELF (Univ. Constantine 2); Prof. Lamia HAMZA (Univ. Bejaia)*

ID	Title	Author
131	Secure cyber-attacks detection on VANET with a Quantum Generative Adversarial Network	YOUSFI Mayliss
101	A Federated Learning Framework for Sybil Attack Detection in VANETs using the FedAdam Aggregation Algorithm	HAMMICHE Lamia
130	A VANET Security Approach Based on Extensive-Form Game Theory and K-Means Clustering	BRAHMI Mokrane
81	AI-Assisted Fleet-Aware Planning for Smart Urban Freight Delivery: An Algerian Case Study	BOUSSALIA Serial Rayene
65	A Multi-Objective NSGA-II Approach with Cost-Aware KMeans Initialization for Electric Vehicle Charging Station Placement in Smart Cities	BENMOUSSA Mohamed Mahdi
46	A Cooling-Driven DBSCAN-Assisted MOEA/D for Sustainable Night-Time Urban Goods Recovery in Smart Cities	BOUZOUBIA Samira
119	Sustainability Analysis of Mass Transportation: A Framework of Indicators Applied to Trams for Smart Cities	GHENOUCHI Rana Ghousoun

SS3. AI-Assisted Energy Conversion Systems for Green Hydrogen and Electric Transportation *Chair: Prof. Katia KOUZI (Univ. Laghouat)*

ID	Title	Author
42	Modeling, Sizing, and SOC-Based Energy Management of a Fuel Cell–Battery Hybrid Electric Vehicle Using Python Simulation	GUENAYA Wiame
30	Thermo-Electric Performance Enhancement of Hybrid PVT Systems Using Intelligent Fuzzy Cooling Strategy Case Study: Laghouat, Algeria	MAAMERI Fatima
33	Benchmarking Hippopotamus Optimization against PSO and GWO for 2RC Lithium-Ion Battery Parameter Identification under Grid Storage Duty Cycles	MOULAI Mohammed Racim
41	Electromagnetic Thermal Coupling Analysis of Induction Motor for Electric Vehicles	HAMEL Meziane
31	Direct Instantaneous Torque Control with a Double-Integral Synergetic Outer Loop for a 24/16 Switched Reluctance Motor in Electric-Vehicle Propulsion	CHEKNANE Abdelmalek

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Virtual Thematic Sessions **MONDAY 26 October 8h30-18h30** Moderator Chair: Prof. Dalila CHERIFI (Univ. Boumerdes, Alg.)

V1. Photovoltaic–Battery Systems: MPPT, Power Conversion and Energy Management *Chairs: Prof. Amel ABBADI (Univ. Medea); Dr. Abhishek VERMA (IEEE SM, Usa)*

ID	Title	Author
157	Hybrid ANN-Choquet MPPT with Dual-Loop PI Control for Photovoltaic Systems	Houria BAYARASSOU
83	Design and Optimization of a Photovoltaic-Powered Micro Converter	Fatna BAHLOULI
12	Improvement of Power Flow Management in PV-Battery-Grid Systems through the Firefly Algorithm	Abdelkader BENSLIMANE
25	Real-Time State of Charge Estimation of Battery and Supercapacitor in a PV-Based LVDC Microgrid with HESS	Soundous REMACHE
74	Hybrid Photovoltaic–Battery Energy Management Strategy for Autonomous Fixed-Wing UAVs in Smart City Surveillance Applications	Nourddine GHELEM

V2. Advanced Control of Wind Energy Systems and Electric Drives *Chairs: Prof. Fethia HAMIDIA (Univ. Medea, Alg.); Dr. Ramesh SINGH (Tata, India)*

ID	Title	Author
91	Application of Optimal Type-1 Fuzzy Logic and Vector Control for Permanent Magnet Synchronous Generator–Based Onshore Wind Energy System	Farouk MECHNANE
96	Real-Time Implementation of Hybrid Fuzzy Sliding Mode MPPT Controller for PMSG in Wind Energy Systems	Lakhdar SAIHI
22	Upgrading Fixed-Pitch Wind Turbines: Performance Benefits of Variable Pitch Control	Boubakar FARADJI
48	Reinforcement-Learned Inner-Loop Control for Permanent Magnet Synchronous Motor Drives with a Synergetic Outer Loop	Houcine SAYAF

V3. Explainable and Deep Learning for Diagnosis and Classification *Chairs: Dr. Anup KAGALKAR (IEEE SM, USA.);*

ID	Title	Author
117	A Quality-Aware Fuzzy Neuro-Symbolic CNN Framework for Explainable Increased Cup-Disc Classification Using BRSET	Faïçal HIMA
80	A Weighted Ensemble Deep Convolutional Neural Network for Diabetic Retinopathy Classification	Hasnia MERZOUG
54	Comparing Lightweight and Heavy Deep Learning Architectures for Extremity Bone Fracture Classification in Smart Healthcare	Naif ALJARI
9	Reliable Solar Panel Fault Diagnosis Using Explainable Artificial Intelligence	Seyyid Ahmed MEDJAHED
154	An Intelligent Data Analysis Framework for Photovoltaic Fault Diagnosis Using PSO and Type-2 Fuzzy Logic	Souria SIF

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V4. Wireless Networks, IoT Communications and Antenna Design *Chairs: Dr. Sakina ATOUI (UDES/EPST-CDER); Prof. Lamia HAMZA (Univ. Bejaia)*

ID	Title	Author
88	Contention Regulation and Arbitration-Based RU Access Control for IoT Uplinks over OFDMA	Said OULD AMARA
87	Re-Contention-Based RU Reassignment for Uplink OFDMA IoT Communications	Said OULD AMARA
100	Multi-Link Adaptive Congestion-Aware Balancing: A Fine-Grained Traffic Allocation Policy for IEEE 802.11be Multi-Link Operation	Kenza KICHOU
116	Bandwidth Enhancement of 5G Patch Antenna through Parameter Prediction Using Random Forest Machine Learning	Ibrahim FORTAS

V5. Renewable Energy Assessment, Harvesting and Sustainable Materials *Navneet TYAGI (IEEE SM, Usa)*

ID	Title	Author
37	Techno-Economic Optimization and Uncertainty Analysis of Wind Turbine Selection for Grid-Connected Wind Energy Generation in the Laghouat Region	Bilal ADJEROUD
133	A Hybrid Geostatistical–Machine Learning Framework for High-Resolution Mapping of Solar Energy Potential in Semi-Arid Regions: Application to Algeria	Sonia GRICHE-HEDLI
122	An Integrated Optical–Thermal–Electrical Framework for Bifacial Photovoltaic Modules under Low-Albedo Conditions	Khaoula RAHRAH
20	Multiobjective Optimization of MLP Neural Network Controller for Autonomous Thermoelectric System with Enhanced Energy Harvesting	Celia AOUGHLIS
171	AI-Assisted Multiscale Materials Discovery: From Crystal Structure and DFT Descriptors to Functional Hybrid Materials for Sustainable Energy Technologies	Sonia BAAZIZ

V6. Modelling and Optimization of Devices, Materials and Structures *Gaurav PATHAK (IEEE SM, Usa);*

ID	Title	Author
61	Thermal Study of a Microcoil Using a Microchannel Cooling System	Fatna BAHLOULI
62	Exploring the SBOA Metaheuristic Technique for Accurate Parameter Characterization of MS and MIS Junctions	Abdellah FRITAH
76	Artificial Neural Network-Based Prediction of Surface Roughness in Magnetic Field-Assisted Turning of XC38 Steel under Lubricated Conditions	Charef Eddine LAHRECHE
58	AI-Driven Seismic Performance and Structural Optimization of RC Floor Diaphragms: Metaheuristic Approach under Sustainable Geometric Constraints	Kheira RAHMANI

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V7. Monitoring, Predictive Maintenance and Fault Tolerance

Satyam NIKHRA (IEEE SM, Usa)

ID	Title	Author
51	Edge AI-Powered IoT Framework for Real-Time Monitoring and Predictive Maintenance of Photovoltaic Systems	Abdesselem BEGHRICHE
136	SmartFlux: A Hybrid Machine Learning and Deep Learning Framework for Real-Time IoT Energy Monitoring and Anomaly Detection in Small and Medium Enterprises	Sofiane BENABBES
142	Robust Fault-Tolerant Control of a SCARA Robot Using a Time Delay Estimator	Dihya MAINCER
144	Energy-Aware Fault Tolerance in Cloud Data Centers	Mohamed Amine AMEUR

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