



Ministry of Higher Education and Scientific Research
University of Mouloud Mammeri, Tizi-Ouzou
Faculty of Electrical Engineering and Computer Science

International Conference on Artificial Intelligence,
Embedded Systems, and Renewable Energy



PROGRAM
15-17 December 2025

Day 1 - Opening

Conference Chair: **ZIRMI**
Monday, December 15, 2025 at 8:30 – 9:00 (GMT+1)

Day 1 – Keynote 1

Speaker: **PROF. TEDJANI MESBAHI**

Smart Battery and Hybrid Energy Storage Systems for Electric Vehicles and Drones: Advanced Energy Management Strategies and Applications

Monday, December 15, 2025 at 9:00 – 9:45 (GMT+1)

Day 1 – Coffee Break

Monday, December 15, 2025 at 9:45 – 10:15 (GMT+1)

Day 1 – Keynote 2

Speaker: **DR. HACIB BEN AISSA**

Energy Transition and Industry Decarbonisation: Emerging Pathways and Technologies

Monday, December 15, 2025 at 10:15 – 11:00 (GMT+1)



PROGRAM
15-17 December 2025

Day 1 - Oral Session 1 - Track 1

Session Chair:

Session Title: **Renewable Energy Innovation, Control, and Optimization**

Monday, December 15, 2025 at 11:00 – 12:00 (GMT+1)

MM_Room01

- 67 **Sustainable Power Generation via Olive Solid Waste Gasification in the Tizi Ouzou Region.**
Abdenour Elias and Abderrezak Kennas
- 71 **Analysis of Long-Term Performance Degradation in Photovoltaic Modules**
Amar Hadj Arab, Bilal Taghezouit, Fatah Mehareb, Smail Semaoui, Kamel Abdeladim, Ismail Bendaas, Abdelhak Razagui, Kada Bouchouicha, Saliha Boulahchiche and Fella Tobbal
- 77 **Sensorless Voltage-Oriented Control of Modular Multilevel Converters for Wind Power Systems**
Mustapha Asnoun, Adel Rahoui, Koussaila Mesbah, Boussad Boukais, Noumidia Amoura and Seddik Bacha
- 130 **Improved Funnel Control Strategy with PI Regulation for Wind Energy Systems for Maximum Power Point Tracking**
Zaina Ait Chekdhidh, Aghiles Ardjal and Maamar Bettayeb

Day 1 - Oral Session 1 - Track 5

Session Chair:

Session Title: **Advanced Control, Optimization, and Sustainable Technologies for Renewable Energy Systems**

Monday, December 15, 2025 at 11:00 – 12:00 (GMT+1)

MM_Room02

- 33 **Solar Inverter Performance Prediction Using Double Exponential Curve Fitting**
Lyazid Kaci, Amar Hadj Arab and Rachid Zirmi
- 44 **Robust Generalized Predictive Speed with Direct Torque Control for Multiphase Wind Generators under Parametric Uncertainty**
Kamel Ouari, Amel Kasri, Youcef Belkhier and Zoubir Boudries
- 58 **Energy-Efficient and Sustainable Approaches to AS/RS Design and Control: A Comprehensive Review**
Omar Bahmid, Sihem Kouloughil and Bendiouis Amaria
- 97 **Equivalent Consumption Minimization Strategy for Energy Management in Unmanned Aerial Vehicle**
Haroune Aouzellag and Sabrina Nacef



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PROGRAM
15-17 December 2025

Day 1 - Oral Session 1 - Track 6

Session Chair:

Session Title: **AI-Driven Automation and Robotics for Precision Agriculture**

Monday, December 15, 2025 at 11:00 – 12:00 (GMT+1)

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| 92 | Using a UAV Crop Monitoring System for Early Tomato Disease Detection and Decision Support
Dimosthenis Minas, Theodosios Chronopoulos and Michalis Xenos |
| 105 | Sensor-Driven Real-Time Obstacle Detection for Agricultural Drone Spraying Systems
Ahmed Lallal, Sabrina Mokrani, Tassadit Sadoun and Mehammed Daoui |
| 112 | Fruit Anomaly Detection and Manipulation Using a Vision-Guided Autonomous Aerial Manipulator
Bidjad Souier, Choukri Bensalah, Rida Mokhtari, Amal Choukchou Braham and Mohamed Abderrahim |

Day 1 – Lunch Break

Monday, December 15, 2025 at 12:00 – 13:00 (GMT+1)

Day 1 – Keynote 3

Speaker: **MR. DANIEL COOK**

Energy Management and Storage with Bio-Based Phase Change Materials

Monday, December 15, 2025 at 13:00 – 13:45 (GMT+1)



PROGRAM
15-17 December 2025

Day 1 - Oral Session 2 - Track 1

Session Chair:

Session Title: **Innovations in Renewable Energy Conversion, Optimization, and Integration**

Monday, December 15, 2025 at 13:45 – 14:45 (GMT+1)

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- 27 **Performance and Emission Analysis of LPG-Hydrogen Dual Fuel Engines**
Hassina Ghodbane, Fouad Khaldi and Bahloul Derradji
- 55 **Comparative Study of the Different Structures of Multi-Level Inverters for the Connection of PV Systems to the Power Grid**
Amina Benabda and Amina Azizi
- 83 **Hippopotamus Optimization Algorithm-Based Robust Tilt-FOID Control Design for Linear Time-Invariant Systems in Renewable Energy Applications**
Elouahab Bouguenna, Samir Ladaci, and Akila Djoudi Gherbi
- 107 **Coupled Magneto-Mechanical Modeling of a Marine Wave Energy Recovery System**
Bachir Ouartal, Meziane Hamel, Mustapha Zaouia, Ratiba Fellag, Riad Moualek and Ahmed Nait Ouslimane

Day 1 - Oral Session 2 - Track 5

Session Chair:

Session Title: **Advanced Forecasting, Control, and Energy Harvesting**

Monday, December 15, 2025 at 13:45 – 14:45 (GMT+1)

MM_Room02

- 138 **Design and Development of a Piezoelectric Shoe Using Lead-Free Composite Materials for Mechanical Energy Harvesting**
Zakia Chelli, Massine Gana, Hakim Achour, Abdel Madjid Djidda, Yacine Baghdadadi, Malika Saidi, Mourad Laghrouche and AHCÈNE Chaouchi
- 140 **Energy Management of a Smart District Using the Neural Predictions and Predictive Control Model (MPC)**
Zoulikha Ouchefoun, Mourad Hasni and Lakhdar Guenfaf
- 173 **Enhanced Battery Health Forecasting with Dynamic Thresholds Using Multi Input LSTM Networks**
Rafik Saddaoui, Karim Oudiai, Mhenna Nachef, Hamid Hamiche, Rachid Zirmi and Mourad Laghrouche
- 185 **Predictive Control of DFIG in a Hybrid PV/DFIG/Batt System Supplying a Water Pumping System**
Tarek Boudjerda, Sofia Lalouni Belaid and Salah Tamalouzt



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PROGRAM
15-17 December 2025

Day 1 - Oral Session 2 - Track 6

Session Chair:

Session Title: **Intelligent Sensing and Prediction for Agricultural Systems**

Monday, December 15, 2025 at 13:45 – 14:45 (GMT+1)

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| 134 | Prediction of a Tunnel Greenhouse Relative Humidity Using Artificial Neural Network
Salah Bezari, Asma Adda and Sidi Mohamed El Amine Bekkouche |
| 161 | Review of Smart Systems in Aquaculture and Aquaponics
Elarbi Kacemi, Khelifa Benahmed and Tariq Benahmed |
| 178 | Comparative Analysis of YOLOv8, YOLOv11, and Faster R-CNN for Multi-Crop Plant Disease Detection
Rim Gasmi, Marwa Chander and Mohamed Amine Badache |



PROGRAM
15-17 December 2025

Day 1 - Poster Session

Session Chair:

Session Title: **Smart Energy, Machine Learning, and Power Materials Reliability**

Monday, December 15, 2025 at 14:45 – 15:30 (GMT+1)

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- 72 **Smart Energy Control in PV-Battery Systems Using Three-Level Boost Converters with DC-Link Voltage Regulation via Genetic Algorithm**
Ahmed Bahri, Nabil Mezhoud, Bilel Ayachi, Abdelkrim Thameur, Farouk Boukhenoufa and Abderrahmane Bellaouar
- 85 **Bio-Inspired Method for Optimal Energy Management and Efficiency Improvement of Microgrids**
Nabil Mezhoud, Ahmed Bahri, Farouk Boukhenoufa, Bilel Ayachi, Lakhdar Bouras and Ilham Ahmed Hazila
- 131 **Thermal Aging Effects on the Electrical, Mechanical and Physicochemical Properties of LDPE Power Cables Insulation**
Ferhat Slimani, Abdallah Hedir, Mustapha Moudoud, Omar Lamrous, Soraya Nait Larbi and Sébastien Rondot
- 142 **Comparative Numerical Study of Multilayer Walls with and without Phase Change Materials for Enhanced Thermal Performance**
Asma Bouterfif and Farid Mechighel
- 146 **Design and Implementation of a Modular Cold Storage System**
Bouchra Lahlou, Latefa Ghomri and Mohammed Sari
- 151 **Performance Assessment of ANN and MLR Models for Predicting NF/RO Desalination System**
Asma Adda, Salah Bezari and Salah Hanini
- 163 **Heart Beat IoT: Real-Time Cardiac Monitoring**
Saliha Rabehi, Malika Saidi, Hayat Hammouche, Nadia Serkhane, Hakim Achour, Ahcène Chaouchi, Mourad Laghrouche, Nouara Lamrani, Mohamed Rguiti, Christian Courtois, Yannick Lorgouilloux and Mohamed Aymen Ben Achour
- 177 **Effect of Critical Current Density Dependence on the Internal Magnetic Field Penetration in an HTC Superconducting Bulk**
Asma Azzouza, Hicham Allag and Jean-Paul Yonnet
- 183 **Machine Learning for Predictive Maintenance of Electrical Machines: A Review**
Taher Amraoui, Samir Merad and Ahmed Amrane
- 184 **Hydrothermal Degradation Impacts on the Properties Of PVC Cables Insulation**
Hassene Ait Ouazzou, Ferhat Slimani and Mustapha Moudoud
- 191 **Ultraviolet Aging Effects on the Dielectric Properties of PVC/Al₂O₃ Nanocomposites Cables Insulation**
Sabrina Amraoui, Abdallah Hedir, Ferhat Slimani, Mustapha Moudoud, Omar Lamrous and Ali Durmus



PROGRAM
15-17 December 2025

Day 1 - Online Session - Track 1

Session Chair:

Session Title: **Advanced Renewable Energy Systems: Design, Monitoring, and Control**

Monday, December 15, 2025 at 15:30 – 17:30 (GMT+1)

MM_Room01

- 136 **Study and Development of Methodology for Dimensioning Photovoltaic Systems (PVS)**
Leonardo Kunen, André Tavares, Breno Carvalho and Franciele Ronchi
- 153 **Daily Energy Production Patterns in Medium-Scale Hydroelectric Operations: a Longitudinal Descriptive Study**
Elmer Arellanos-Tafur and Marcelo Damas-Niño
- 156 **Design and Implementation of a Low-Cost Automatic Weather Station Based on the Internet of Things**
Sefia Attia, Abdelkader Mechernene and Mourad Loucif
- 158 **From Grid Following to Grid Forming in PV Grid Tied Single Phase Inverter**
Mourad Zebboudj, Syphax Ihammouchen, Toufik Rekioua, Djamila Rekioua, Ali Chebabhi and Mohammed Said Ouahabi
- 167 **Overshoot-Free Speed Control in PMSG Wind Turbines Using a Smooth Sliding Mode Controller**
Wassila Hattab, Abdelhamid Benakcha, Seddik Tabet, Amira Slimani, Ahmed Marouane Ghodbane
- 186 **Seasonal Variability and Performance Optimization of Wind Power Generation: A Comprehensive Study of ENGIE Operations**
Elmer Arellanos-Tafur and Marcelo Damas-Niño



PROGRAM
15-17 December 2025

Day 1 - Online Session - Track 5

Session Chair:

Session Title: **Metaheuristic Optimization and Control Strategies for Hybrid Systems**

Monday, December 15, 2025 at 15:30 – 17:30 (GMT+1)

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| 28 | PSO Algorithm for Optimal of Fuzzy Logic Controller for A DC-DC Buck Converter
Ahmed Bennaoui, Aissa Ameer, Ameer Bennaoui and Salah Benzian |
| 64 | Two-Level Hierarchical Control of a PV-Battery Hybrid Energy System Using Differential Flatness-Based Strategy and MShOA-Tuned FOPID Controller
Hadjer Chabana, Ilyes Tegani, Hamza Afghoul and Soumia Merah |
| 73 | Comparative Optimal Dispatch Control Strategies for a Hybrid Renewable Energy System
Mourad Zebboudj, Djamila Rekioua and Toufik Rekioua |
| 115 | Energy Management of a PEMFC/Battery Electric Vehicle Using a State Machine Strategy
Khoudir Kakouche, Toufik Rekioua, Djamila Rekioua, Amira Slimani, Zahra Mokrani and Mohammed Amine Soumeur |
| 149 | Optimization of Energy Management in a PV-Wind-Battery Microgrid Using PSO in MATLAB
Meziane Kaci, Hassane Ezziane, Slim Rouabah, Zakaria Layate, Hakim Ait Said and Hamou Nouri |
| 154 | Statistical Assessment of Commercial Electric Service Quality: A Case Study of ENEL Distribution Company in Peru
Marcelo Damas-Niño and Elmer Arellanos-Tafur |
| 162 | Optimal Distribution Network Reconfiguration for Minimizing Energy Losses and Enhancing Reliability Using Metaheuristics
Anes Bouhanik, Samir Bouslimani, Ahmed Salhi, Djemai Naimi, Younes Zahraoui and Saad Mekhilef |



PROGRAM
15-17 December 2025

Day 1 - Online Session - Track 6

Session Chair:

Session Title: **Machine Intelligence and Sensing Technologies for Precision Agriculture and Water Management**

Monday, December 15, 2025 at 15:30 – 17:30 (GMT+1)

MM_Room03

- 30 **Hybrid WCA-HS Based Control for Autonomous Quadrotor Navigation in Precision Agriculture**
Nesrine Tenniche, Boubekur Mendil, Farid Ghilas and Lamine Brikh
- 40 **Advancing Infiltration Modeling with Deep Learning: A Superior Alternative to Empirical Approaches in the Mitidja Plain**
Amina Mazighi, Mohamed Meddi and Hind Meddi
- 91 **Advancing Agricultural Robotics: AI Control Strategies for Delta Robots**
Issam Kessira, Ali Chabane, Nawel Ghazi, Khaled Benfriha and Samir Meradi
- 98 **Early-Season Water Use Patterns in Wheat and Barley under Semi-Arid Conditions: A Lysimetric Approach**
Omar Bouziane, Mohamed Meddi and Amina Mazighi
- 147 **IoT-Based Climatic Environment Monitoring System Design for a Cattle Breeding Buildings**
Sihem Souiki, Mourad Hadjila, Reda Yagoub, Abdelillah Boudjella and Oussama Ahed Messaoud
- 157 **Integrated Geophysical Approach for Groundwater Prospecting**
Doria Kutrubes and Khaled Bounar



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PROGRAM
15-17 December 2025

Day 2 – Keynote 1

Speaker: **PROF. HAMID LAGA**

Efficient Deep Learning for 3D/4D Shape Analysis: From Medical Applications to Generative AI

Tuesday, December 16, 2025 at 9:00 – 9:45 (GMT+1)

Day 2 – Coffee Break

Tuesday, December 16, 2025 at 9:45 – 10:15 (GMT+1)

Day 2 – Keynote 2

Speaker: **PROF. FREDE BLAABJERG**

Challenges of Renewable Energy Integration in Clean Energy Systems

Tuesday, December 16, 2025 at 10:15 – 11:00 (GMT+1)



PROGRAM
15-17 December 2025

Day 2 - Oral Session 1 - Track 1

Session Chair:

Session Title: **Advanced Photovoltaic Materials and Solar Forecasting**

Tuesday, December 16, 2025 at 11:00 – 12:00 (GMT+1)

MM_Room01

- 22 **Comparative Analysis of Pure ZnO, Ag-Mn Codoped ZnO, and Mn:ZnO/Ag/Mn:ZnO Multilayer Transparent Conductive Oxides for Photovoltaic Applications**
Fouaz Lekoui, Khaoula Settara, Rachid Amrani, Elyes Garoudja, Walid Filali, Slimane Oussalah, Driss Dergham and Salim Hassani
- 41 **Characterization of EVA/phase change material blend embedded with zinc oxide (ZnO) nanomaterial as nanocomposite for photovoltaic module encapsulation process**
Kamel Agroui, Lyes Maifi, Ouided Hioual, Aicha Ayadi and Abdelhamid Chari
- 70 **Surpassing 16% Efficiency in Cd-Free CZTS Solar Cells via Si Back-Contact Engineering and IR Harvesting**
Lynda Metref, Essaid Mansouri, Mahfoud Abderrezek and Samira Sali
- 171 **A Hybrid Electrical and Environmental LSTM Approach for Short-Term Solar Power Forecasting in Algeria**
Rafik Saddaoui, Samir Aoughlis, Karim Oudiai, Nacheff Mhenna, Hamiche Hamid and Mourad Laghrouche

Day 2 - Oral Session 1 - Track 2

Session Chair:

Session Title: **Edge AI and Intelligent Monitoring for Energy Systems**

Tuesday, December 16, 2025 at 11:00 – 12:00 (GMT+1)

MM_Room02

- 26 **Recent Advances in the Application of TinyML and Edge Devices in Solar Photovoltaic Systems: Bridging the Gap Between Laboratory Research and Industry**
Adel Mellit and Marco Zennaro
- 49 **An Embedded AI Model for Defect Detection in Photovoltaic Modules Using a Jetson Nano-Powered Unmanned Aerial Vehicle**
Nouamane Kellil, Adel Mellit, Toufik Benkherouf and Maamar Bettayeb
- 125 **Unbalance fault detection in an IoT-Connected Motor Network Using Artificial Neural Networks**
Massine Gana, Zakia Chelli, Rafik Saddaoui, Hakim Achour and Mourad Laghrouche



PROGRAM
15-17 December 2025

Day 2 - Oral Session 1 - Track 3&4

Session Chair:

Session Title: **Data-Driven Modeling and Optimization in Power Systems**

Tuesday, December 16, 2025 at 11:00 – 12:00 (GMT+1)

MM_Room03

36 **Advanced Polynomial and Gaussian Regression Frameworks for Predictive Modeling of Tangential Discharge Phenomena in High-Voltage Insulation Systems**

Nabila Saim

80 **Data-Driven Based Sparse Identification of Nonlinear Dynamics for Stability Analysis of Mixed Grid-Following and Grid-Forming Inverters**

Houssam Deboucha, Bessam Deboucha, Elyazid Amirouche, Said Aissou, Ali Berboucha, Kaci Ghedamsi and Saad Mekhilef

121 **Formal Concept Analysis for Knowledge Extraction and Optimal Configuration Selection in Photovoltaic Installations**

Zina Ait Yakoub, Ali Bechouche and Djaffar Ould Abdeslam

170 **Study of a Hybrid PV/Fuel Cell System Dedicated to an Electric Vehicle Charging Station**

Mohamed Lamine Hamida, Damya Iamrache, Sarah Maouche, Hakim Denoun, Arezki Fekik, Dyhia Kais and Zoulikha Tebri

Day 2 – Lunch Break

Tuesday, December 16, 2025 at 12:00 – 13:00 (GMT+1)

Day 2 – Keynote 3

Speaker: **DR. KAMAL HADIDI**

Innovating Chemical Manufacturing: Low-Temperature Solutions for Energy Efficiency and Emissions Reduction

Tuesday, December 16, 2025 at 13:00 – 13:45 (GMT+1)



PROGRAM
15-17 December 2025

Day 2 - Oral Session 2 - Track 1

Session Chair:

Session Title: **Intelligent Control and Fault Diagnosis in Photovoltaic Systems**

Tuesday, December 16, 2025 at 13:45 – 14:45 (GMT+1)

MM_Room01

- 59 **A Novel Linguistic Hedge-Based Fuzzy Logic Controller for Enhanced MPPT in PV Systems**
Chellali Benachaiba
- 61 **Tuning of a Neutrosophic Fuzzy Controller for DC Motor Using the Novel Qudwa Metaheuristic**
Chellali Benachaiba
- 87 **Experimental Study of Solar Water Pump Control by Arduino**
Amina Azizi and Amina Benabda
- 93 **Open-Circuit Fault Diagnosis of a Three-Level Boost Converter for Photovoltaic Applications**
Abdeljabar Benrabah, Mouaad Belguedri, Mohamed-Amine Yahiaoui, Fayçal Benyamina and Mohamed Benbouzid

Day 2 - Oral Session 2 - Track 2

Session Chair:

Session Title: **Control and Security in Modern Renewable Energy Systems**

Tuesday, December 16, 2025 at 13:45 – 14:45 (GMT+1)

MM_Room02

- 53 **Security of Grid-Connected Photovoltaic Plants A Mini-Review and Future Directions**
Nassiha Boutana, Rokia Chekirou, Adel Mellit and Maamar Bettayeb
- 141 **Direct Power Control Technique for Wind Power Generation System based on a Double Stator Induction Generator (DSIG)**
Fatma Lounnas
- 190 **Development and Design of an Intelligent Energy Router**
Rachid ZIRMI, Belkacem Zouak, Nadhir Djefal, Abderrahmane Alem, Massinissa Kloul and Hakim Achour



PROGRAM
15-17 December 2025

Day 2 - Oral Session 2 - Track 3&4

Session Chair:

Session Title: **Intelligent Control and Optimization in Renewable Energy Systems**

Tuesday, December 16, 2025 at 13:45 – 14:45 (GMT+1)

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| 123 | Improving the Performance of a Wind Turbine PID Controller Using GWO Optimization and Fuzzy Logic
Houari Habiba and Nouredine Zerhouni |
| 128 | Stabilizing Photovoltaic Output Using a Controlled Ćuk Converter Topology
Mohamed Kaouane, Nidhal Cherrat and Akkila Boukhelifa |
| 188 | Anomaly Detection in Datacenter Energy Consumption Using an Autoencoder
Karima Oukfif |
| 194 | Optimizing Batteries Charging Time Inside an Autonomous Photovoltaic System Installed on a House's Roof
Salah Tamalouzt, Kamel Djermouni, Ali Berboucha, Kaci Ghedamsi and Djamal Aouzellag |



PROGRAM
15-17 December 2025

Day 2 - Poster Session

Session Chair:

Session Title: **Smart Sensing, and Intelligent Control in Energy and IoT Systems**

Tuesday, December 16, 2025 at 14:45 – 15:30 (GMT+1)

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- 38 **Determination of the Minimum Capacitance for Self-Excitation of a SEIG, Taking Into Account the Speed Ramp Up**
Madjid Si Brahim, Rabah Rouas, Rahma Kachenoura and Salah Haddad
- 57 **Comparative Analysis of MPPT Algorithms for Photovoltaic Systems Under Partial Shading: A MATLAB/Simscape-Based Study**
Ahmed Chebri, Fatima Zohra Boukahil, Assala Mouffouk and Boubekur Azoui
- 90 **Transformer Fault Diagnosis Using HHO-Enhanced XGBoost and Liquid Dielectric Signal Analysis**
Tarek Bouguettaya, Abderrahim Reffas, Mohammed Adaika, Hicham Talhaoui, Oualid Aissa and Sherif S. M. Ghoneim
- 110 **Graph-Based Semi-Supervised Learning for Fault Clustering in Grid-connected PV Systems**
Nassim Sabri
- 114 **Detection of Silicone Oil Concentration Using a Two-Dimensional Photonic Crystal Sensor**
Sarrah Bendib, Saidani Okba, Abderrahim Yousfi and Nadhir Djeflal
- 120 **AI-Enabled Wearable IoT Device for Facial Recognition in Student Transportation Systems**
Dhai Eddine Salhi, Majdi Rawashdeh, Mohamed Tahar Bennai, Awny Alnusair and Ali Karime
- 135 **Dynamic Performance Evaluation of a Dual-Star Induction Machine Fed by an Indirect Matrix Converter**
Sifoura Mezoud, Celia Mehanaoui and Ahmed Azib
- 159 **A Low-Cost and Eco-Friendly Humidity Sensor Based on Keratin Thin Film**
Hayat Hammouche, Rachida Douani, Ahcène Chaouchi, Saliha Rabhi, Nouara Lamrani and Mourad Laghrouche
- 172 **Wearable Low-Energy RFID-Integrated Vibration Tag for Silent, Long-Term Sleep Apnea Monitoring and Posture Sensing**
Rafik Saddaoui, Samir Aoughlis, Karim Oudiai, Mhenna Nacheff, Hamid Hamiche and Mourad Laghrouche
- 175 **Low Power Energy and Real-Time Localization of Prisoners Inside Correctional Facilities Using Inertial Sensors and Particle Filtering: A Dead Reckoning Approach**
Samir Aoughlis, Rafik Saddaoui, Karim Oudiai, Hamid Hamiche, Brahim Achour and Mourad Laghrouche



PROGRAM
15-17 December 2025

Day 2 - Online Session - Track 1

Session Chair:

Session Title: **Innovations and Optimization in Wind, Solar, and Hybrid Renewable Systems**

Tuesday, December 16, 2025 at 15:30 – 17:30 (GMT+1)

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- 68 **A Heuristic Optimization Approach for Wind Turbine Dimensions to Enhance Energy Capture and Reduce Costs**
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- 75 **Advancements in Solar Energy Systems: Innovations in Photovoltaic (PV) and Floating PV Technologies for Decentralized Energy Production**
Mourad Naidji
- 103 **Current Sensor Fault Diagnosis of Wind Power System Based on DFIG**
Chaima Gherari, Farid Berrezzek, Hicham Zaimen and Khaled Khelil
- 106 **Cold plasma-Based Methane Dry Reforming for Hydrogen Production**
Abir Azara and Khadidja Khodja
- 122 **Recent Advancements in Energy Management for Hybrid Renewable Energy Systems**
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- 152 **Renewable Energy Deployment Efficiency: Analyzing Algeria's Achievement Gap and Optimization Strategies**
Elmer Arellanos-Tafur and Marcelo Damas-Niño



PROGRAM
15-17 December 2025

Day 2 - Online Session - Track 2

Session Chair:

Session Title: **Advanced Control and Modeling for Wind and PV Energy Systems**

Tuesday, December 16, 2025 at 15:30 – 17:30 (GMT+1)

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- 43 **Real-Time Sensorless Control for PMSG Wind Generators Using Step-by-Step Sliding Mode Observer on STM32**
Sofiane Benabit, Hocine Khati, Arezki Fekik and Malek Ghanes
- 52 **Two Step Ahead Finite Set Predictive Torque Control Using Improved Sliding Mode Control for Three Phase Induction Motor**
Sofiane Brahami, Kaci Ghedamsi, Yanis Hamoudi and Abdelyazid Achour
- 78 **A Prototype Design of Smart DC Power Device for Solar System Application**
Khadar Saad, Larbi Brahimi, Mohamed Elbar, Meriem Ghezal, Aya Mebarki and Sif Eddine Souadia
- 117 **Co-Simulation and Modeling of WT-AFPMSG Based on Ansys Software and MATLAB/Simulink for Wind Energy Application**
Lina Bouhafs, Salah Tamalouzt, Mustafa Ergin Şahin and Ahcene Bouzida
- 118 **Enhanced Fault-Tolerant Harmonic Compensation in Grid-Connected PV Systems: A Comparative Study of Analog Filters for Cascaded Multilevel Inverter Control**
Sabrina Nacef, Haroune Aouzellag, Bessam Amrouche, Rabah Babouri and Kaci Ghedamsi
- 119 **Enhanced Direct Current Control in Grid-Following Inverters Using Open-Loop Synchronization and PR Regulator for Renewable Energy Integration**
Lakhder Ayhar, Ahmed Safa, Abdelmadjid Gouichiche and Fayssal Elyamani Benmohamed
- 129 **A Space Vector Modulation Scheme for Five-Phase to Three-Phase Indirect Matrix Converter for a Wind Power Application**
Celia Mehanaoui, Sifoura Mezhoud, Ahmed Azib and Nabil Taib



PROGRAM
15-17 December 2025

Day 2 - Online Session - Track 3&4

Session Chair:

Session Title: **Advanced AI, Forecasting, and Control Strategies in Modern Energy Systems**

Tuesday, December 16, 2025 at 15:30 – 17:30 (GMT+1)
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- 31 **Fault Diagnosis of Induction Motors Using Convolutional Neural Networks**
Benyamine Arroul, Farid Taffine and Farid Ghilas
- 101 **Autonomous Photovoltaic/Thermal Solar Solution for Resilient Isolated Habitats**
Djamila Rekioua, Nabil Mezzai, Toufik Rekioua, Zahra Mokrani, Khoudir Kakouche, Adel Oubelaid and Chokri Ben Salah
- 109 **Intelligent Hysteresis Current Control Based on Support Vector Machine for SAPF Integrated PV System Under Nonstationary Harmonics**
Mustapha Meraouah, Faiza Kaddari, Said Hassaine, Youcef Mihoub and Sandrine Moreau
- 145 **Forecasting Electrical Outages in Adrar, Algeria: Towards a Smart Energy Management System**
Samia Bentaieb, Driss Nehari, Ammar Neçaibia and Messaoud Hamouda
- 155 **A Multidisciplinary Systems Engineering Approach to Hybrid Energy Systems Development**
Khaled Bounar and Salah Badjou
- 168 **A LADRC-Based Robust Speed Controller for PMSMs in Electric Vehicles With External Disturbance Rejection**
Amira Slimani, Amor Bourek, Abdelkarim Ammar, Khoudir Kakouche, Wassila Hattab and Samira Heroual
- 182 **Emerging AI Methodologies in the Renewable Energy Ecosystem: Successes, Challenges, and Future Research Directions (v2)**
Temitope Bobola and Temitayo Fagbola