

# 2<sup>nd</sup> Edition



المدرسة العليا للتكنولوجيا  
Ecole Supérieure de Technologie

MATSI  
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Joint Conference  
MIESAT'23/AISA'23

# JOINT CONFERENCE AISA'23 MIESAT'23



December  
21th-23th, 2023



Campus  
Du Savoir  
Oujda



## TECHNICAL PROGRAM



PARTNERS



ROYAUME DU MAROC  
Ministère de l'Enseignement Supérieur,  
de la Recherche Scientifique et de l'Innovation



ROYAUME DU MAROC  
ACADÉMIE (HASSAN II)  
DES SCIENCES ET TECHNIQUES



المدرسة العليا للتكنولوجيا  
Ecole Supérieure de Technologie  
Université Mohammed VI de Tlemcen



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Ecole Supérieure de Technologie  
Université Mohammed VI de Tlemcen



المركز الوطني للبحث العلمي والتقني  
CNRST



**ABOUT THE CONFERENCE:**

The LGEM & MATSI Laboratories and Higher School of Technology Oujda of Mohammed First University organize the joint conference MIESAT'23/AISA'23. It is scheduled to take place in Oujda, Morocco from December 21 to 23, 2023. This joint conference is a combination of two conferences: the International Conference in Mechanical Industrial Energy Systems and Automotive Technology (MIESAT'23) and the International Conference on Artificial Intelligence and Smart Applications (AISA'23). The main objective of this joint conference is to explore various issues and provide solutions related to Artificial Intelligence, Healthcare, Industry, and emerging technologies.

The MIESAT'23/AISA'23 joint conference aims to create a remarkable platform for the exchange of ideas, techniques, and tools among researchers, PhD students, engineers, innovators, industrial experts, and policymakers. This joint conference serves as a space to foster discussions, raise awareness, and share experiences in the practical and theoretical aspects of Artificial Intelligence, IoT systems, and smart applications across various fields including Industry, Robotics, Green Energy, Healthcare, Smart City, Transportation, Agriculture, and more.

***The Organizing Committee of the MIESAT'23/AISA'23 joint conference welcomes you and wishes you success in the work of this conference.***

**The General Co-Chairs:**

Prof. Jamal Bouchnaif, Prof. Hassan Zahboune, Prof. Faouaz Jeffali,  
Prof. Omar Moussaoui, Prof. Mohcine KODAD

## General Scientific Program of Joint Conference MIESAT'23/AISA'23

**Thursday, Decembre21<sup>th</sup>, 2023**

14:00 – 18:00	<b>Welcome and Registration (ESTO)</b>
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**Friday, Decembre22<sup>th</sup>, 2023**

08:00 – 09:00	<b>Welcome and Registration (Campus Du Savoir)</b>
09:00 – 09:30	<b>Official Opening Ceremony</b>
09:30 – 11:00	<b>Keynote #1:</b> MOSTAFA AZIZI, ESTO, Mohammed First University, Oujda, Morocco <b>Keynote # 2:</b> RAPHAEL ROMARY, Artois University, France
11:00 – 11:15	<b>Coffee Break</b>
11:15 – 12:45	<b>1st Session: Green Energy</b> (Conference Hall)
11:15 – 12:45	<b>2nd Session: Artificial Intelligence &amp; Healthcare</b> (ROOM1)
14:00 – 15:00	<b>Lunch</b>
15:00 – 16:30	<b>Keynote #3:</b> HABIL PETAR SABEV VARBANOV, Brno University of Technology, Czechia <b>Keynote # 4:</b> MOHAMMED AOUAM, <i>Global Cyber Risk &amp; Governance</i> , PepsiCo, Texas, USA
16:30 – 16:45	<b>Coffee Break</b>
16:45 – 18:30	<b>3rd Session: Cybersecurity &amp; Web Analytics</b> (Conference Hall)
16:45 – 18:30	<b>4<sup>th</sup> Session: Automation &amp; Control Systems</b> (ROOM1)

**Saturday, Decembre23<sup>th</sup>, 2023**

09:00 – 09:30	<b>Welcome and Registration (Campus Du Savoir)</b>
09:30 – 10:15	<b>Keynote # 5:</b> AMAL BOUICH, Polytechnic University of Valencia, Spain
10:15 – 10:30	<b>Coffee Break</b>
10:30 – 12:15	<b>5<sup>th</sup> Session: Artificial Intelligence &amp; Smart Applications</b> (Conference Hall)
10:30 – 12:15	<b>6<sup>th</sup> Session: Industry 4.0 &amp; Predictive Maintenance</b> (ROOM1)
10:30 – 12:15	<b>7<sup>th</sup> Session: Green Environment</b> (ROOM2)
12:15 – 13:00	<b>Awards &amp; Closing</b> (Conference Hall)
13:00	<b>Lunch</b>

# Detailed Scientific Program of Joint Conference MIESAT'23/AISA'23

**Thursday, Decembre 21th, 2023**

<b>14:00 – 18:00</b>	<b>Welcome and Registration</b>
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**Friday, Decembre 22<sup>th</sup>, 2023**

<b>08:00 – 09:00</b>	<b>Welcome and Registration</b>
<b>09:00 – 09:30</b>	<p><b>Official Opening Ceremony (Conference Hall)</b> Moderator: Pr. Mohammed ADLI, Pr. El Hassan Herrag</p> <ul style="list-style-type: none"> <li>- <b>President of Mohammed First University, Oujda, Morocco</b></li> <li>- <b>Director of High Institute of Technology, Oujda, Morocco</b></li> <li>- <b>MIESAT'23 General Co-Chair Talk</b></li> <li>- <b>AISA'23 General Co-Chair Talk</b></li> </ul>
<b>09:30 – 10:15</b>	<p><b>Keynote # 1:</b> <b>Mostafa AZIZI</b>, ESTO, Mohammed First University, Oujda, Morocco <b>“AI in Healthcare and Medicine”</b> (Moderators: Pr. Mimoun MOUSSAOUI, Pr. Mohcine KODAD)</p>
<b>10:15 – 11:00</b>	<p><b>Keynote # 2:</b> <b>RAPHAEL ROMARY</b>, Artois University, France <b>“Dignosis of Electrical Machines by Analysing External Magnetic Field.”</b> (Moderators: Pr. Wafae EL HAMDANI, Pr. El Mostafa ZIANI)</p>
<b>11:00 – 11:15</b>	<b>Coffee Break</b>
<b>11:15 – 12:45</b>	<p><b>1st Session: Green Energy (Conference Hall)</b> (Chairs: Pr. Mostafa EL OUARIACHI, Pr. Kamal KASSMI, Pr. Rachid ABOUTNI)</p> <p><b>ID13:</b> Anas Hassari and Kamal Hirech and Mohammed Rhiat, <i>An overview on the integration of hybrid renewable energy architectures.</i></p> <p><b>ID14:</b> Mohammed Rhiat, Mohammed Kerrouchi, Anas Hassari, Ilias Atmane, Mustapha Melhaoui, Kamal Hirech, Mostafa El Ouariachi and Jamal Bouchnaif, <i>Harnessing Photovoltaic Energy with DC Power Converters for Optimized Performance with Resistive Loads.</i></p> <p><b>ID23:</b> Alae Azouzoute, <i>Evaluating the Viability of Agrivoltaic Integration in Arid Environments: A Case Study in Eastern Morocco.</i></p> <p><b>ID34:</b> Kawtar Fahlane, Mostafa El Ouariachi, Abdelhak Aziz and Kamal Hirech, <i>Improvement of energy extracted from photovoltaic modules by an embedded system.</i></p> <p><b>ID35:</b> Wafae Arfaoui, <i>Study of the power quality produced by a small variable-speed asynchronous wind turbine connected to the low-voltage grid.</i></p> <p><b>ID36:</b> Mouad Karmoun, <i>Assessing the Synergies of Renewable Energy, Electric Vehicles, and Vehicle-to-Grid Technology in National Energy Systems.</i></p>

11:15 – 12:45	<b>2nd Session: Artificial Intelligence &amp; Health Care(ROOM 1)</b> (Chairs: Pr. Mohammed MERZOUGUI, Pr. Reda KORIKACHE, Pr. M'Barek NASRI)
	<b>ID7:</b> Oumaima GAMGAMI, Reda KORIKACHE, <i>Medical Diagnosis based on Artificial Intelligence: Heart Disease Case.</i>
	<b>ID9:</b> Abdou-essamad Jabri, Mostafa Azizi, <i>Exploration of Medical IoT security with blockchain.</i>
	<b>ID38:</b> Mimoun Yandouzi, Mohammed Berrahal, Mounir Grari, Omar Moussaoui and Mostafa Azizi, <i>Machine-Learning-based Decision Support System for Patient Diagnosis COVID-19.</i>
	<b>ID1:</b> Yassine El Kaneb and Mohcine Kodad, <i>Review of Natural Language Processing (NLP) for Dialect Recognition.</i>
<b>ID3:</b> Mohammed ELAOUNI, Mohamed EL GHAFIANI, <i>Harnessing Deep Learning for Inverse Design of Photonic materials.</i>	
14:00	Lunch
15:00 – 15:45	<b>Keynote # 3:</b> <b>HABIL PETAR SABEV VARBANOV</b> , Brno University of Technology, Czechia <i>“The Potential for GHG Emission Reduction and Increased Energy Security of Distributed Electricity Storage Interacting with Urban and Rural Prosumers based on the RESHeat system.”</i> (Moderators: Pr. Abdelhak AZIZ & Pr. Hassan ZAHBOUNE)
15:45 – 16:30	<b>Keynote # 4:</b> <b>MOHAMMED AOUAM</b> , Global Cyber Risk & Governance, PepsiCo, Texas, USA <i>“The Evolution of Managed Security Service Providers (MSSPs): Balancing AI with Human-Centric Skills.”</i> (Moderators: Pr. Omar MOUSSAOUI & Pr. Abdelkader BETARI)
16:30 – 16:45	Coffee Break
16:45 – 18:30	<b>3rd Session: Cybersecurity &amp; Web Analytics(Conference Hall)</b> (Chairs: Pr. M. EL BOUKHARI, Pr. M. BLEJ, Pr. A. BENAZZI)
	<b>ID6:</b> Mourad Kattass, Hamid El Bourakkadi, Younes Qobbi, Abdelatif Jarjar, Abdellah Abid, Abdelhamid Benazzi, <i>Image Encryption using Random Crossover Implemented in Improved Vigenère Technique.</i>
	<b>ID11:</b> Hicham Rrghout, Hakim Chemlal, Mourad Kattass, Naima Benazzi, Younes Qobbi, Abdelatif Jarjar, Abdelhamid Benazzi, <i>The encryption of images using the Hill Cipher under the control of a chaotic vector.</i>
	<b>ID16:</b> Asma Ajbari and Mohammed El Boukhari, <i>The Web Security Impact of Online Visitor Tracking.</i>
	<b>ID18:</b> Youness Ikkou and Mohammed El Boukhari, <i>Detection and measurement of Web tracking.</i>
<b>ID27:</b> Mustapha Hammouti, Omar Moussaoui and Abdelkader Betari, <i>Survey of Optimal LoRa Mesh Scalable and Reliable Routing Algorithms for Forest Fire Detection.</i>	

<b>16:45 – 18:30</b>	<b>4<sup>th</sup> Session: Automation &amp; Control Systems (ROOM 1)</b> (Chairs: Pr. Mohamed EL HAFYANI, Pr. Khalid GRARI, Pr. Hicham BOUALI)
	<p><b>ID17:</b> Abderrahman Ouaanabi, Abdelkader Benbouaza, Abdelhamid Senhaji and Jamal Bouchnaif, <i>Methods for Diagnosis Rotating Machine Faults.</i></p> <p><b>ID19:</b> Assia Sadiqi, <i>Energy-Efficient Scheduling with Various Maintenance Activities.</i></p> <p><b>ID26:</b> Meriam Miraoui and Mohamed El Hafyani, <i>Comparative Study of Three Controllers for PMSM.</i></p> <p><b>ID28:</b> Lahcen Amri, Abdelhamid Senhaji, Mohamed El Hafyani, Smail Zouggar, Attar Abdelilah, Tarik El Allaoui, Jean-Frederic Charpentier and Mohamed Kebdani, <i>A Practical Method for Determining the Initial Angle of Permanent Magnet Synchronous Motor.</i></p> <p><b>ID29:</b> Abdelhamid Senhaji, Lahcen Amri, Attar Abdelilah, Mohamed El Hafyani, Abderrahman Ouaanabi and Jamal Bouchnaif, <i>SPACE 1104-Based Scalar Control Implementation for PMSM.</i></p> <p><b>ID40:</b> Attar Abdelilah, Grari Khalid, Abdelouhab Mostafa, Abdelhamid Senhaji, Lahcen Amri, Mohamed El Hafyani and Jamal Bouchnaif, <i>Papid Control Prototyping for the Brushless DC Motor using dSPACE CP1104.</i></p>

**Saturday, Decembre23<sup>th</sup>, 2023**

<b>09:30 – 10:15</b>	<b>Keynote # 5:</b>  <b>AMAL BOUICH</b> , Polytechnic University of Valencia, Spain  <i>“The road to stable perovskites solar cells commercialization: perspectives and challenges”</i>  (Moderators: Pr. Abdelkader Ben bouaza, Pr. Smail ZOUGGAR)
<b>10:15 – 10:30</b>	<b>Coffee Break</b>
<b>10:30 – 12:15</b>	<b>5<sup>th</sup> Session: Artificial Intelligence &amp; Smart Applications (Conference Hall)</b> (Chairs: Pr. Wafae MRABTI, Pr. Samir AMRAQUI, Pr. Mohammed TAHRICHI,)
	<p><b>ID4:</b> Amira Zrouri, EL FARISSI Ilhame, <i>Review of literature on the intersection of machine learning and the Internet of Things to enable water quality monitoring and improve water resource management and optimization.</i></p> <p><b>ID8:</b> Mohamed Yassine Rhafes, Omar Moussaoui and Maria Simona Raboaca, <i>Forecasting Solar Energy Production for Green Hydrogen Production: A Comparative Analysis of Support Vector Machine and Artificial Neural Networks.</i></p> <p><b>ID12:</b> Ayoub Oulahyane and Mohcine Kodad, <i>Securing Cities from Disasters: The Role of AI and Drones in smart city (Manhole Inspection).</i></p> <p><b>ID33:</b> Aboubekr Allam, <i>Long-term electricity consumption forecasting in Morocco Using Artificial Neural Network and Recurrent Neural Network.</i></p> <p><b>ID37:</b> Mimoun Yandouzi, Mounir Grari, Omar Moussaoui, Mostafa Azizi, Kamal Ghomid and Aissa Kerkour Elmiad, <i>Satellite Imagery and Machine Learning for Forest Fire Detection and Monitoring.</i></p> <p><b>ID42:</b> Mohammed-Tarik Benhafoune, Hamza Barboucha, <i>what are the Challenges of Using Facial Recognition to Measure Customer Satisfaction?</i></p> <p><b>ID45:</b> Ismail Hajji, Boutaina Hassani, <i>Artificial Intelligence in the University.</i></p> <p><b>ID5:</b> Mohamed Rahmouni and Mohcine Kodad, <i>Literature Review: Integrating Machine Learning in Social Network Analysis.</i></p>

10:30 – 12:15	<b>6<sup>th</sup> Session: Industry 4.0 &amp; Predictive Maintenance (ROOM 1)</b> (Chairs: Pr. Jamal YOUSFI, Pr. Badr LAHFAOUI, Pr. Mohammed JEYAR)
	<p><b>ID10:</b> Ouïam Khattach, Omar MOUSSAOUI and Mohammed Hassine, <i>Improved Machine Failure Prediction with a Hybrid LSTM-SVM Approach.</i></p> <p><b>ID15:</b> Abdelilah Serji, El Bekkaye Mermri and Mohammed Blej, <i>Enhancing Road Safety Through Fuzzy Timed Petri Nets: A Model for Intelligent Forward Collision Warning Systems.</i></p> <p><b>ID20:</b> Chaymae Bahtat, Abdellah El Barkany, Abdelouahhab Jabri, <i>Integrating Reconfigurability into Manufacturing Systems in the Era of Industry 4.0</i></p> <p><b>ID24:</b> Badr-Eddine Benahmed, <i>Implementation of an MES "Manufacturing Execution System" on the plant's production lines for automatic retrieval of production statuses.</i></p> <p><b>ID25:</b> Zayneb Miraoui, Mohcine Kodad and Abdelkader Nasser, <i>Construction industry and smart applications: BIM toward Digital Twin.</i></p> <p><b>ID30:</b> Farahe Talssi, <i>Predictive Maintenance in the Age of Industry 4.0</i></p> <p><b>ID39:</b> Youness Hammoudi, <i>Analysis of Electrical Parameter Behavior in Faulty Conditions of Photovoltaic Systems.</i></p>
10:30 – 12:15	<b>7<sup>th</sup> Session: Green Environment(ROOM 2)</b> (Chairs: Pr. T. OUCHBEL, Pr. A. NASSER & Pr. R. BENKADDOUR)
	<p><b>ID21:</b> Chaymae Naaza and Abdellah El Barkany, <i>Evaluation of the State of the Civil Engineering Structures in the Province of Fes-Moulay Yacoub.</i></p> <p><b>ID22:</b> Hayat Ouadi, <i>Image-Driven Focused Crawler: A Hybrid Model for Table-Rich Content.</i></p> <p><b>ID31:</b> Chaimae Merimi, Belkheir HAMMOUTI, Tadeusz SZUMIATA, Rachid TOUZANI, Hassan ELGAZ, <i>Exploring the Corrosion Inhibition of Carbon Steel in Acidic Environments: A Synthesis of Theoretical and Experimental Investigations into the Impact of Diazole Compounds.</i></p> <p><b>ID32:</b> Tarik El Allaoui, Smail Zouggar and Lahcen Amri, <i>Control of Standalone Wind Powered Water Pumping System.</i></p> <p><b>ID41:</b> Abdelaziz Benkhalifa and Mohcine Kodad, <i>The adoptability of smart classes and its underlying tools in Morocco.</i></p> <p><b>ID43:</b> Elasri Ouahid, Fatima Safa, Meryem Rouegui, Ikram Yousfi, <i>The Production of Biogas from Agricultural Waste Contributes to Sustainably Reducing Morocco's Energy Dependence.</i></p> <p><b>ID44:</b> Meryem Rouegui, Fatima Safa, Ikram Yousfi, Elasri Ouahid, <i>Evaluation of Renewable Energy Production from Livestock Waste in Morocco.</i></p> <p><b>ID46:</b> A. El khlifi, H. Lgaz, Mustafa R. Al-Hadeethi, Rachid Salghi, M. Ouhssine, Hamid Erramli, <i>Exploring Corrosion Resistance in N80 Carbon Steel: Evaluating the Efficacy of Hydrazone Derivatives in Acidic Media through Experimental and Theoretical Approaches.</i></p>
12:15 – 13:00	<b>Awards &amp; Closing(Conference Hall)</b> (Moderator: Prof. Jamal HADADI)
	<b>Joint Conference MIESAT'23/AISA'23 Organizing Committee Talk</b>
13:00	Lunch