

INTERNATIONAL CONFERENCE

IC-SMAI

2026

International Conference on
Statistical Modeling & Artificial Intelligence

CONFERENCE PROGRAM

April 08–09, 2026 • Casablanca, Morocco

AI & Data-Driven Modelling Statistical Modelling Engineering Systems
Industrial Applications Health & Safety Didactics

Organized by: Industrial Engineering & Logistics / LP2MGI Laboratory
Higher School of Technology of Casablanca (ESTC) — Hassan II University

<https://www.icsmai2026.com/>

IC-SMAI 2026

International Conference on Statistical Modeling & Artificial Intelligence

Casablanca, Morocco

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Conference Program

Main Topics

Statistical
Modelling
& Applied
Mathematics

Artificial In-
telligence &
Data-Driven
Modelling

Engineering Sys-
tems Modelling

Industrial,
Chemical &
Parachemical
Applications

Health, Safety &
Interdisciplinary
Applications

Didactics,
Pedagogical
Modelling

Welcome Note

IC-SMAI 2026 brings together researchers, academics, industry experts, and practitioners to exchange recent advances in statistical modelling, artificial intelligence, and their applications in engineering, industry, health, and education.

Conference Highlights

2 Days **80+ Papers** **International Speakers**
April 08–09, 2026 Accepted Contributions Academia & Industry

Venue: EST Casablanca, Route d'El Jadida, Km 7, Casablanca, Morocco

Website: <https://www.icsmai2026.com/>

Committees

Honorary Committee

- Pr. Houssine Azeddoug — President of Hassan II University of Casablanca, Morocco
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- Pr. Mustapha Lkhider — Vice President for Scientific Research, Cooperation, and Partnerships, Hassan II University of Casablanca
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Presentation Guidelines

- Oral presentations: **12 minutes** + **3 minutes discussion**.
- Authors should be present in the assigned room at least **10 minutes before** the beginning of the session.
- Poster presenters are requested to install their posters before the poster session.
- All presentation files must be uploaded to the session room computer in advance.

International Keynote Speakers

Academic Speakers

- **Prof. Dhouib Diala**
Institut Supérieur de Gestion Industrielle de Sfax (ISGI), Tunisia
- **Prof. Yarba Ahmed**
Director, Institut Supérieur de Génie Industriel (ISGI), Nouakchott, Mauritania
- **Dr. Moumouni Wagé Abdoul Razak**
Maître de conférences, Faculty of Science and Technology (FST), Université André Salifou, Zinder, Niger

Socio-Economic and Industry Speakers

- **Dr. Mohammed Said Bensbih**
Expert in Statistical Modeling and Digital Transformation
- **Dr. Mohammed Hadini**
CEO of a Multinational Company, Specialist in Industrial Engineering and Decision-Making
- **Pr. bouaziz abdelhaq**
Former Professor of Higher Education (PES), ESTC Casablanca
Specialist in Epistemology and Scientific Methodology

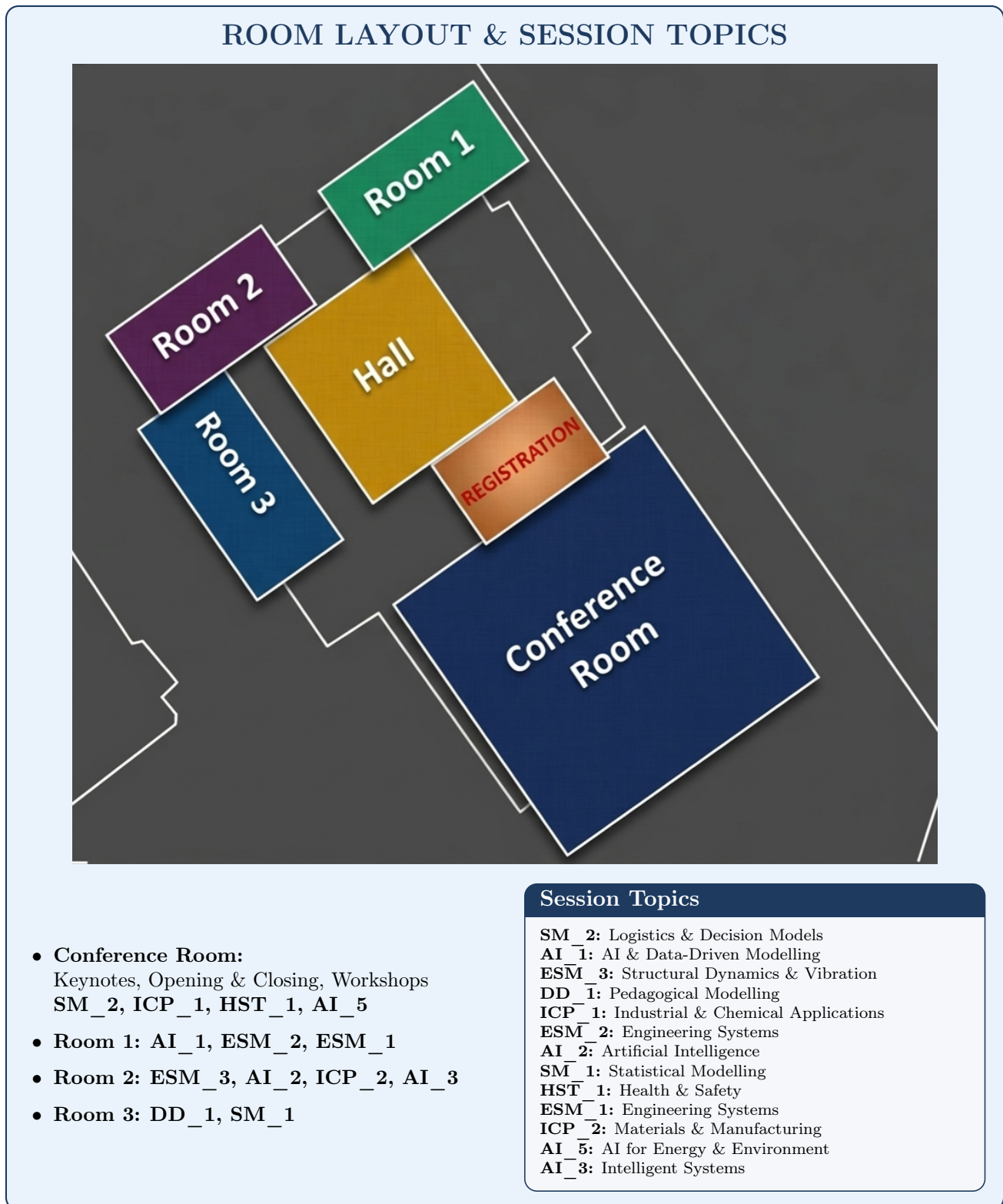
About the Speakers

IC-SMAI 2026 brings together distinguished academic and industry experts from several countries. These invited speakers contribute with their expertise in statistical modeling, artificial intelligence, industrial systems, and decision-making processes, offering valuable insights into both theoretical advances and real-world applications.

Main Program Overview

Time	Wednesday, April 08, 2026
08:00 – 09:15	Registration & Welcome Coffee
09:15 – 09:45	Opening Ceremony
	Welcome Address & Conference Introduction
09:45 – 10:30	Plenary Lecture (Keynote Speaker 1)
	Statistical Modeling and Artificial Intelligence for Industrial Systems
10:30 – 11:00	Coffee Break
11:00 – 12:30	Parallel Oral Sessions 1–4
	Conference Room: ICSMAI_SM_2 — Logistics, Performance & Decision Models
	Room 1: ICSMAI_AI_1 — Artificial Intelligence & Data-Driven Modeling
	Room 2: ICSMAI_ESM_3 — Structural Dynamics, Smart Structures & Vibration
	Room 3: ICSMAI_DD_1 — Diagnostics, Pedagogical Modelling & Digital Learning
12:30 – 14:00	Lunch Break
14:00 – 14:45	Plenary Lecture (Keynote Speaker 2)
	Qualitative Research and Artificial Intelligence
15:00 – 16:30	Parallel Oral Sessions 5–8
	Conference Room: ICSMAI_ICP_1 — Industrial, Chemical & Parachemical Applications
	Room 1: ICSMAI_ESM_2 — Engineering Systems Modelling
	Room 2: ICSMAI_AI_2 — Artificial Intelligence & Data-Driven Modeling
	Room 3: ICSMAI_SM_1 — Statistical Modelling & Applied Mathematics
16:30 – 17:00	Coffee Break
17:15 – 18:15	Parallel Oral Sessions 9–11
	Conference Room: ICSMAI_HST_1 — Health, Safety & Interdisciplinary Applications
	Room 1: ICSMAI_ESM_1 — Engineering Systems Modelling
	Room 2: ICSMAI_ICP_2 — Chemical, Materials & Manufacturing Systems
Time	Thursday, April 09, 2026
08:30 – 08:45	Registration & Welcome Coffee
08:45 – 10:30	Plenary Lecture (Keynote Speaker 3)
	<i>Worldview and Paradigm: Epistemological Issues in the Process of Knowledge Production</i>
10:30 – 12:30	Training Workshops
	Statistical Modeling (Qualitative and Quantitative Methods)
11:00 – 12:30	Parallel Oral Sessions 12–13
	Conference Room: ICSMAI_AI_5 — AI for Energy, Environment & Smart Systems
	Room 2: ICSMAI_AI_3 — Artificial Intelligence & Intelligent Systems
12:30 – 14:00	Lunch Break
14:00 – 14:45	Closing Ceremony
	Best Oral Presentation Award • Best Poster Award • Certificate Distribution • Official Closing of IC-SMAI 2026
15:00 – 16:00	IC-SMAI'26 Organizing Committee Meeting

Conference Room Map

**Quick Orientation**

Participants are kindly invited to complete their check-in at the **Registration** desk before joining their assigned session room. The **Hall** serves as the main circulation and waiting area, providing direct access to **Room 1**, **Room 2**, **Room 3**, and the **Conference Room**.

All **keynote lectures**, the **opening and closing ceremonies**, and selected main sessions take place in the **Conference Room**. Parallel oral sessions are distributed across the other rooms according to the scientific program. Participants are encouraged to consult the room map and session allocation before each time slot.

Detailed Program — Day 1

Wednesday, April 08, 2026

08:00 – 09:15

Registration and Welcome of Participants

09:15 – 09:45 Official Opening of the Conference

Prof. Houssine Azeddoug — President of UH2C University, Casablanca, Morocco

Prof. Essamoud Rachid — Director of EST, UH2C University, Casablanca, Morocco

Prof. Mohamed Chafi — Director of LP2MGI Laboratory, UH2C University, Casablanca, Morocco

Prof. Mohamed Ben ali — General Chair, ESTC, UH2C University, Casablanca, Morocco

09:45 – 10:30 Keynote Speaker 1

Speaker: Dr. Mohamed HADINI

Affiliation: UH2C / ENSEM, Casablanca, Morocco

Title: *Statistical Modeling and Artificial Intelligence for Industrial Systems*

Room: Conference Room

10:30 – 11:00

Coffee Break

Oral Session 1 — ICSMAI SM 2: Logistics, Performance & Decision Models

Chairs: Pr. Hassan Ifassiouen - Pr. Moulay Ali El Oualidi - Pr. Messaoudi Najat - Pr. Abderrahim Benlakouiri

Room: Conference Room

- **A PLS-SEM Approach to Modeling University Performance: Quality Practices and Responsible AI Capability as Structural Determinants**
Yassmin El Haddadi
- **Hybrid Models and Explainable AI: Towards Enhanced Optimization of Supply Chains**
Zineb Belmadani
- **Model for Assessing the Impact of Artificial intelligence (AI) on performance of young companies: Casablanca Case**
My Elmostapha Houssam Ouazzani
- **Treatment Of Multicollinearity In The Optimisation Of Parameters For Thermodynamic Activity Coefficient Models**
Wiam El fadel
- **Performance improvement through Lean Six Sigma: A study of Moroccan companies**
Hasnaa Alozade
- **Data-Driven Modeling and Artificial Intelligence for Enhancing Supply Chain Resilience in Strategic Sectors During Systemic Crises**
Zakaria Dghoughi
- **To propose a conceptual model for studying the impact of digital transformation on the performance of transport companies**
Omar Talibi

Oral Session 2 — ICSMAI_AI_1: Artificial Intelligence & Data-Driven Modelling

Chairs: : Pr. Abdelkrim Ammoumou - Pr. Mohamed El Kamili -Pr. Khalid Bouragba -Pr. Mohammed Ouzzif

Room: Room 1

- **Hybrid Artificial Intelligence and Statistical Approaches for Data-Driven Streamflow Modeling and Forecasting in the Oued Al Abid Basin**
Ikram Mgouni
- **Artificial Intelligence for Predicting Startup Success: A Systematic Literature Review**
Nada Abid
- **DiabNet-RAG: A Retrieval-Augmented Generation Framework with Structured Clinical Guidelines for Improving Diagnosis and Management of Type 2 Diabetes in Moroccan Primary Care**
Yassin Zaouane
- **Hybrid AI-Statistical and Multi-Agent Approaches for Intelligent Vulnerability Detection: A Narrative Review**
Khansae Letrach
- **AI-Driven Data Security: A Narrative Review of Multi-Agent Dynamic Encryption**
Nouha Amimar
- **Exploring Artificial Intelligence Applications in Software Quality Assurance: A Systematic Review**
Salma Mouayad

Oral Session 3 — ICSMAI_ESM_3: Structural Dynamics, Smart Structures & Vibration

Chairs: Pr. Rhali Benamar; Pr. Adri Ahmed; Pr. Abdellatif Rahmouni; Pr. Issam El Hantati

Room: Room 2

- **Analysis of geometrically nonlinear free vibrations of double beams coupled by a nonlinear elastic system modeled by a cubic nonlinearity**
Mustapha Hassa
- **Damped vibration of Terfenol-D functionally graded beams on viscoelastic foundations**
Brahim Echouai
- **Optimization of Elastic Support Locations and Material Properties for Nonlinear Vibration Control of Cable-Stayed Beams**
Mohamed Berjal
- **A Multimode Approach for the Nonlinear Free and Forced Vibration Analysis of a Cable-Stayed Beam**
Mohamed Rjilatte
- **Nonlinear Vibration Control of Carbon Nanotubes at High Temperatures via Magnetic Fields and Elastic Foundation**
El Kouchi Echouai

Oral Session 4 — ICSMAI_DD_1: Diagnostics, Pedagogical Modelling & Digital Learning

Chairs: Pr. Aziz Soulhi –Pr.Abdelhaq Bouaziz – Pr. Khalid Es-Skali Pr. Marouane Moukhliiss

Room: Room 3

- **Impact of Digital Transformation on the Improvement of Supply Chain Management Performance in Agrifood Companies**
Khalid Akarouch
- **L’usage de l’intelligence artificielle en éducation par les étudiants du niveau supérieur et son impact**
Nadia Hachad
- **Cross-Dialectal Robustness of Arabic Transformers for Hate Speech Detection: A Large-Scale Benchmark Including Moroccan Darija**
Abdelkarim Tahiri
- **Industry 5.0 and the performance of Moroccan companies: A review of literature**
Nabil Dahmani
- **From Profit Centered to Trust Centered Smart Management: A New Framework for AI Era Organizations**
Saif Amellah
- **Artificial Intelligence for Cost of Quality System: Toward a Trusteeship-Based Ethical Framework**
Rida Foulad
- **A Generative AI-Driven Intelligent Tutoring Framework within LMS for Enhancing Higher-Order Cognitive Skills**
Malika Ait Amadi

12:30 – 14:00

Lunch Break

14:00 – 14:45 Keynote Speaker 2

Speaker: Dr. Mohamed Saïd Bensbih

Affiliation: Researcher & Guest Lecturer, Digital Transformation

Title: *Digital Transformation*

Room: Conference Room

Oral Session 5 — ICSMAI_ICP_1: Industrial, Chemical & Parachemical Applications

Chairs: Pr. Nouredine Kamil - Pr. Brahim Messnaoui -Pr. Younes Abouliatim - Pr. Sanaa Kouzbour

Room: Conference Room

- **A Modified NRTL Model for Accurate Prediction of Vapor–Liquid Equilibria**
Radouane Chatit
- **A Modified NRTL Model for Calculating Liquid-Liquid Equilibrium and Predicting Plait Point Coordinates**
Hamid Elmaazouzi
- **A Novel Polymer Inclusion Membrane Containing an Organometallic Complex Carrier for The Extraction and Recovery of Chromium and Nickel from batteries lithium-ion**
Chaïmaa Elkahlaoui
- **Engineered PVDF-HFP Membranes for Enhanced Desalination Performance in Membrane Distillation**
Zineb Ait Fares

- **Analytical development and application of the QuEChERS method, GC-MS/MS for the extraction and determination of contaminants in foodstuffs**
Abdelmouhaimin Khouchab

Oral Session 6 — ICSMAI_ESM_2: Engineering Systems Modelling

Chairs: Pr. Samir Aghzer - Pr. Guennoun Mohammed - Pr. Bouchra Bahja- Pr. Abdellah Sassi

Room: Room 1

- **Industrial heat exchanger fouling: from raw data to intelligent prediction**
Imane Lafram
- **Robustness Study of Passive Filters Under Varying Load Conditions: Resonance Risk Analysis**
Salma Mahboub
- **Multi-objective thermo-economic optimization of shell-and-tube heat exchangers using Bell- Delaware method and NSGA-II algorithm under TEMA standards**
Laila Ettajani
- **A Quantitative Metrics Framework for Validation of Digital Twins in Industrial Systems**
Hicham Agourame
- **Dynamic Modeling of Temperature and Humidity under Hybrid Ventilation in Broiler Houses**
Narjice Elghardouf
- **Statistical and Machine Learning Models for Indoor Temperature Homogenization in Poultry Buildings: Energy Optimization and Animal Welfare**
Jihane Chtioui
- **Physics-Informed Edge-AI Framework for Real-Time Fault Characterization in Photovoltaic Microgrids**
Reda Adjar

Oral Session 7 — ICSMAI_AI_2: Artificial Intelligence & Data-Driven Modelling

Chairs: Pr. Youssef Mejdoub - Pr. Abderrahim Maizate - Pr. Abdessalam El Yassini- Pr. Jawad Lamterkati

Room: Room 2

- **A Comparative Study of Artificial Intelligence Tools for Forecasting and Optimization in Photovoltaic Energy Systems**
Ghita Loukili
- **Use of TRIZ and AI in problem solving of automotive industry**
Chaymae Elmjiyyad
- **Artificial Intelligence for Automated Bone Fracture Detection: A Structured Review of Architectures and Clinical Performance**
Salma Ennaqui
- **Artificial Intelligence for Breast Cancer Detection in Mammography: A Review**
Aya Kamel
- **An Overview of Artificial Intelligence Approaches for Knowledge Assessment in Adaptive E-Learning Systems**
Sara Benkhayat

Oral Session 8 — ICSMAI_SM_1: Statistical Modelling & Applied Mathematics**Chairs:** Pr. Touria Neggady Alami - Pr. Hasna Mharzi - Pr. Oumaima Oullada - Pr. Kaoutar ElYakoudi**Room:** Room 3

- **Tarification des risques en assurance non vie en utilisant l'apprentissage statistique**
Abderrahmane Ouakrim
- **A Semi-Supervised Logistic Regression Framework For Fintech Applications**
Abderrahim El Amrani
- **School Effects in Grade Repetition: Multilevel Logistic Evidence from PISA 2022 Morocco**
Ibrahim Allali
- **Explainable Machine Learning for Education Policy Insight: SHAP-Based Determinants of Math Achievement in Morocco**
Ibrahim Allali
- **Design and Psychometric Evaluation of an IRT-Calibrated Item Bank for Computerized Adaptive Testing**
Mohamed El Msayer
- **Toward an optimized approach to Data-Driven Decision Making in Industry 4.0 by using BI and AI**
sara lemtouki
- **Moroccan Stock Market Growth Under Shariah Screening Models: Risk-Adjusted Performance Analysis**
Ismail Barodi

16:30 – 17:00**Coffee Break****Oral Session 9 — ICSMAI_HST_1: Health, Safety & Interdisciplinary Applications****Chairs:** Pr. Inssaf Ghailani - Pr. Ebrahim Kerak- Pr. Mohamed BEN ALI**Room:** Conference Room

- **Integration of Artificial Intelligence within Industry 4.0 Technologies: Current Applications in Smart Biopharmaceutical Manufacturing**
Mariam Coulibaly
- **The impact of NANDA-I, Nursing Interventions Classification (NIC), and Nursing Outcomes Classification (NOC) on the improvement of nursing practice worldwide: A systematic review**
Fatima Ezzahra Fernane
- **Intelligent Platform for Human Health Monitoring**
Ouahbi Younesse
- **Personalized Healthcare: A Review of AI-Driven prediction, Real-Time Monitoring, and Precision Diagnosis**
Chaimaa Fatene
- **Efficiency Analysis of the Moroccan Healthcare System: An Econometric Approach**
Ahmed Bouzit

Oral Session 10 — ICSMAI_ESM_1: Engineering Systems Modelling**Chairs:** Pr. Mohcine Chajdi; Pr. Anass Moukhliiss; Pr. Meryem El Moufari; Pr. Mohamed Maine**Room:** Room 1

- **A Surrogate Adam-Trained Neural Network for Rapid Prediction of Natural Frequencies and Mode Shapes of 3D FGM Beams**
Nassima Ayoub
- **Machine Learning-Assisted Discrete Modeling for the Free Vibration Analysis of AFG Beams under Various Boundary Conditions**
Abdellah Amouch
- **Discrete Modeling and Neural Network Prediction for the Static Response of Cracked AFG Beams**
Ihsan Tikonab
- **State of the Art on Vibration Analysis of Functionally Graded Materials Using Artificial Neural Networks**
Asmaa ELMAKKI
- **Vibration-Based Crack Modeling and Detection in Beam Structures: A State-of-the-Art Review of Classical and Artificial Intelligence Methods**
Elmahdi Ezzoubaidi

Oral Session 11 — ICSMAI_ICP_2: Chemical, Materials & Manufacturing Systems**Chairs:** Pr : Mohammed Chafi - Pr. Essadki Abdelhafid - Pr. Khalid Souhar - Pr Alaâeddine El Halil**Room:** Room 2

- **Impact of Layer Thickness on Tribological Behavior of FDM-Manufactured TPU**
Ahmed El Housni
- **Intelligent High Beam Control and the Impact of Glare from Oncoming Vehicles**
Mohamed Arsali
- **Computational Insights into the Photovoltaic Potential of Gallium Doped Copper Indium Disulfide**
Salaheddine Moujoud
- **eBPF-Driven Kernel Telemetry and Artificial Intelligence for Security Anomaly Monitoring in Cloud-Native Infrastructures**
Mohammed Mouad Moussaid

Detailed Program — Day 2

Thursday, April 09, 2026

08:30 – 08:45

Registration

08:45 – 10:30 **Keynote Speaker 3**

Speaker: Pr. bouaziz abdelhaq

Affiliation: Higher School of Technology of Casablanca (ESTC), Morocco

Title: *Worldview and Paradigm: Epistemological Issues in the Process of Knowledge Production*

Room: Conference Room

10:30 – 12:30

Workshops: Statistical Modeling (Qualitative and Quantitative Methods)

Oral Session 12 — ICSMAI_AI_5: AI for Energy, Environment & Smart Systems

Chairs: Pr. Lhaj El Hachemi Omari; Pr. Mounir Kriraa ; Pr. Abdeslam Tizliouine; Dr. Salaheddine Moujoud

Room: Conference Room

- **Hybrid AI-Statistical Models for Optimizing Marble Powder Substitution in Lightweight Foam Concrete**
Youssef Bachirat
- **Spectral Fingerprinting for the Water-Fertilization Nexus in Olive Oil: Retrospective Water-Nutrient Audit via mid-FTIR and Machine Learning**
Souhaila Hadday
- **Optimization of Phosphoric Acid-Activated Geopolymers Based on Moroccan Clay Using Response Surface Methodology**
Chaimae Moukhlisse
- **Artificial Intelligence for optimizing Magnetic Field seed treatment: A Conceptual Framework**
Boubacar Sidibe
- **Design and Implementation of an IoT-Based Smart Energy Meter using ESP32**
Abdessabour Bounasr
- **Collaborative Robotics in CNC Machining Cells: A Review**
Ayoub Khaya
- **Design and Implementation of a Fuzzy Logic-Based Energy Management System for an AC/DC Microgrid**
Ilham Saadouki

Oral Session 13 — ICSMAI AI 3: Artificial Intelligence & Intelligent Systems**Chairs:** Pr. Abdelwahed Tribak; Pr. Ziyati Elhoussaine; Pr. Abdelmajid El Ouadi**Room:** Room 2

- **Emotion-Driven Crowd Dynamics: A Hybrid GNN-GAT-LSTM Framework for Joint Trajectory and Panic Prediction**
Rachida Bouchkara
- **Human-Centered Artificial Intelligence for Stakeholder Engagement in Digital Project Ecosystems**
Issam Talkam
- **An Adaptive Risk-Aware Decision Framework for Context-Aware Drone-Based Human Detection**
Anas Harki
- **Communication Strategies in Multi-Agent Metaheuristic Systems for Combinatorial Optimization**
Manal El Jaouhari
- **Beyond Prediction: Interpreting LSTM Learning Mechanisms in Rainfall–Runoff Modeling**
Insaf Faraj
- **Explainable and Calibrated Machine Learning for Air Traffic Flow Management Delay Prediction**
Soufiane Momtaz

10:30 – 12:30 Workshops

- **Statistical Modeling (Qualitative and Quantitative Methods)**
Led by Dr. Mohammed Said Bensbih
- **Statistical Modeling and Artificial Intelligence**
Led by Pr. Oullada Oumaima
- **Analysis of Complex Systems: DEMATEL, ISM, and MICMAC**
Led by Dr. Aloxade Hasnaa

Note:

The workshops and oral sessions are conducted in parallel between 10:30 and 12:30. Participants are invited to attend sessions according to their interests.

12:30 – 14:00**Lunch Break****14:00 – 14:45 Official Closing of IC-SMAI 2026**

- Best Oral Presentation Award
- Best Poster Award
- Certificate Delivery
- Official Closing of the Conference

15:00 – 16:00 IC-SMAI'26 Committee Meeting

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Organization-Contact

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Conference & Association



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See You at

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Thank you to all keynote speakers, authors, session chairs, committee members, partners, and participants for contributing to the success of this conference.

END OF PROGRAM

April 08–09, 2026 • Casablanca, Morocco

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