ICSMAI 2025

2nd International Conference on Smart Medical, IoT & Ai

TECHNICAL PROGRAM

ESIAI — ECOLE SUPÉRIEURE D'INGÉNIERIE APPLIQUÉE ET INNOVATION PRIVÉE

IA2D — Association de l'Intelligence Artificielle et du Développement Durable

OUJDA EHEI

UNIVERSITÉ DE LORRAINE

Clarivate Web of Science™

Springer

UNIVERSITÉ DE MONCTON — EDMUNDSTON MONCTON SHIPPAGAN

SINERGiES — Soins Intégrés, Nanomédecine, IA & Ingénierie pour la Santé

OCTOBRE 23-25 | RADISSON BLU, SAÏDIA, MOROCCO

ABOUT THE CONFERENCE

T he **Second International Conference on Smart Medical, IoT & Artificial Intelligence (ICSMAI'25)** brings together researchers, clinicians, engineers, and industry practitioners to advance data-driven healthcare and intelligent connected systems. ICSMAI'25 provides a forum to share cutting-edge results, discuss open challenges, and foster collaborations at the intersection of **medical technologies**, **Internet of Things (IoT)**, and **artificial intelligence**.

Clinical AI and decision support; medical imaging and radiomics; wearable and remote monitoring systems; hospital information systems and digital health; healthcare NLP and conversational agents; bioinformatics, drug discovery and multi-omics; cybersecurity and governance for health data; human factors, education and simulation; smart sensors, edge/embedded AI, and healthcare IoT deployments.

Authors are invited to submit original, unpublished research—including empirical studies, methods and systems, comprehensive surveys, and reports on industrial deployments—that is not under review elsewhere. Submissions should follow the conference guidelines and deadlines published on the ICSMAI'25 website.

ICSMAI'25 is organized by the **LSI Laboratory** together with the **Association of Artificial Intelligence and Sustainable Development (IA2D)**, in collaboration with **Mohammed First University (Oujda)**—including the **Faculty of Sciences**, **Faculty of Medicine and Pharmacy**, the **National School of Applied Sciences**, and the **Higher School of Technology**—the **Mohammed VI University Hospital Center (Oujda)**, and international academic partners: **Université de Franche-Comté (France)**, **Université de Lorraine (France)**, **Université de Moncton (Canada)**, and the **École des Hautes Études d'Ingénierie – Oujda**.

We warmly welcome you to ICSMAI'25 and look forward to your contributions and participation.

The Organizing Committee of the ICSMAI'25

Day 1 — Thursday, Oct 23

Welcome and Registration

Main Conference Registration

14:00 – 15:00

Official Opening Ceremony

Conference Hall

Chair: Moderator: Prof. Kamal GHOUMID
President of Mohammed Premier University
Director of ENSA Oujda
Dean of Faculty of Science
Dean of Faculty of Medicine & Pharmacy
Director of CHU
Organizing Committee

15:00 – 16:00

Keynotes Block #1

Conference Hall

Track: HADDIYA; AKHLOUFI; MESTARI
Keynote #1 – Prof. Intissar HADDIYA: Environmental determinants of hypertension.
Moderator: Prof. K. GHOUMID
Keynote #2 – Prof. Moulay AKHLOUFI: Advances and Challenges in AI for Healthcare.
Moderator: Prof. O. SEFRAOUI
Keynote #3 – Prof. Mohammed MESTARI: From Complexity and Network Science to Graph
Representation Learning: A Graph Neural Network Approach to Polypharmacy Side Effects.
Moderator: Prof. A. NAJI

16:00 – 19:00

Session 1: AI in Healthcare & Medical Diagnosis

Parallel Sessions — Room 1

Chair: M. H. Sebbar, A. Saddari, and D. El Moujtahide
Papers
Faysal ETROUFI — Benchmarking Machine Learning Models for Early Detection of Chronic Kidney Disease
Abderrazak SADDARI — Comparative Analysis of Machine Learning Approaches for Antimicrobial Resistance Prediction and Multi-Drug Resistance Classification
Maryam BENHEDDI — Detection of a rare mutation in exon 20 of the EGFR gene by EasyPGX™ real-time PCR in a case of non-small cell lung cancer at the Oujda pathology laboratory
Maryam BENHEDDI — The Experience of the Pathology Laboratory at Mohammed VI University Hospital of Oujda in the Molecular Analysis of Colorectal Cancers: A Retrospective Study of RAS Status Assessment by Real-Time PCR with TaqMan Probes
Jihane BENBRIK — Machine Learning Approaches for Predicting Vitamin D Levels: Comparative Analysis
Oumaima AAMAROUCHI — Optimizing Brain Tumor Detection: A Novel Approach Using Mixed Initialization Kernels and Genetic Algorithms in Convolutional Neural Networks
Omar SEFRAOUI — Artificial Intelligence for Diagnosis and Analysis of Multiple Sclerosis: A Data-Driven Approach
Oussama ABALI — Temporomandibular Joint Osteoarthritis Pathology and Artificial Intelligence: A Brief Systematic Review
Fatima FATIH — Adaptive optimization of CNN architectures using Tree-structured Parzen Estimator for the diagnosis of lung diseases
Youssef RAFIK — Cardiovascular diseases prediction by machine learning techniques
Ali ARBAOUI — Predicting Autoimmune Flares Using AI and Emotional Analysis

19:00 – 20:30

Dinner break

Hotel Restaurants

20:30 – 22:00

Day 2 — Friday, Oct 24

Welcome and Registration

Main Conference Registration

08:00 – 09:00

Keynotes Block #2

Conference Hall

Track: BENTATA; VOSHMGIR
Keynote #4 – Prof. Yassamine BENTATA: The Future of Medicine: Horizons and Limits!.
Moderator: Prof. M.A. MADANI
Keynote #5 – Prof. Shermin VOSHMGIR: Web3 at the Intersection of Blockchain, AI & IoT.
Moderator: Prof. A. KERKRI

09:00 – 11:00

Session 2: IoT & Edge AI for Smart Systems

Parallel Sessions — Room 1

Chair: M. Yandouzi and M. Grari
Papers
Kishan Reddy BHIMAVARAM — IoT-Based Urban Agriculture Container Farm Design and Implementation for Localized Produce Supply
Vinay DANDAMRAJ — Smart IoT based Hydroponics Farming
Mirthika B — Intelligent Wildlife Monitoring and Repulsion Using YOLOv8-Based Bounding Box
Hicham TIKAOUI — An IoT-Based Comparative Study of Machine Learning and Statistical Models for Energy Consumption Forecasting in Moroccan Buildings
Sidi Omar EL KETTANI — IoT-Edge AI with ISO 42001 Governance for CNC Predictive Maintenance: Multisensor Fusion, Calibration, and Clause-Level Traceability
Chakib TAYBI — A Dual-Band Reconfigurable Antenna Using a PIN Diode for 2.4 GHz and 5 GHz IoT Applications
Belaoufi Yassine — SmartRoute+: Toward Intelligent Road Maintenance Ecosystems through Deep Learning and Mobile Crowdsensing in Morocco
El Miloud AR-REYOUCHI — BAI-PLF: A Blockchain–AI–IoT Framework for Energy-Efficient and Predictive Logistics and Healthcare in Africa
Vighnan KUMAR — AgroHeal – Intelligent Agricultural Assistant for Early Disease Identification and Organic Pesticide Recommendation.

11:00 – 12:30

Session 3: AI for Biomedical Research & Drug Design

Parallel Sessions — Room 2

Chair: H. Bouali, S. Daoudi and R. Malek
Papers
Kaoutar M'RHAR — Exploring Deep Learning for De Novo Drug Design: A Brief Review of Chemical Property Optimization
Oussama GRARI — Harnessing artificial intelligence to tackle biofilm infections: Advances, challenges, and perspectives
El Miloud AR-REYOUCHI — Q2OPT-MED: A Hybrid AI–Heuristic Approach to Healthcare Pathway Optimization
Nazih ASSABBANE — SVHRSP for Skin Ageing: Bioinformatics Rationale and a Microneedle-Delivered Cosmetic Strategy
Mouad ALAOUI MHAMMEDI — Physics-Constrained Generative Inverse Design for Food-Grade Encapsulation Systems
Manale CHAKIR — An experimental evaluation of GRU-based architecture for ICD-9 code assignment using MIMIC-III clinical notes

11:00 – 12:30

Session 4: Smart Hospitals & Clinical Decision Support

Parallel Sessions — Room 3

Chair: M. Zeryouh and K. Alaoui
Papers
N. HAREESH — AI Stethoscope: Revolutionizing Home Healthcare using Machine Learning
Oussama GRARI — Precision and measurement uncertainty verification of procalcitonin assay for AI-enhanced sepsis management in smart hospitals
Dounia EL MOUJTAHIDE — Comparative Analysis of Machine Learning Algorithms for Predicting Creatinine Levels from Blood Parameters
Dounia EL MOUJTAHIDE — Temporal Stability of Biochemical Phenotypes: A Four-Year Analysis of Blood Biomarker Clusters
Sara RAMDANI — Artificial Intelligence and the Internet of Things in Smart Hypertension Management: A State-of-the-Art Review and Future Directions
Yassmine EL MOUSSAOUI — AI-Powered Simulation Platforms for Healthcare Communication Training: Scoping review
Omar SEFRAOUI — Integrating IoT and AI for Smart Medical Systems: Tools, Algorithms, and Challenges in Real-World Healthcare Applications
Hakim NASAOUI — MedACT-CL: Knowledge-Enhanced Tri-Modal Contrastive Learning for Medical Action Recognition
Youssef BADININI — Public–private partnership for bringing healthcare services closer together and digitizing them: The example of connected mobile medical units.
Nour El Houda BENKADDOUR — KidneyLab 2.0: Innovative Integration of Arduino Technology for Immersive Teaching in Renal Hydrosodic Regulation
Hind MOUMNI — Use and Perception of AI for Psychological Self-Help Among Medical Students in Morocco

11:00 – 12:30

Lunch break

Dining Hall

12:30 – 15:30

Keynotes Block #3 (Healthcare Innovations)

Conference Hall

Keynote #6 – Prof. Abdelkrim DAOUDI: Telemedicine in the Eastern region.

15:30 – 17:00

Session 5: AI, NLP & Cybersecurity

Parallel Sessions — Room 1

Chair: A. KERKOUR ELMIAD and R. Naciri
Papers
Omar SEFRAOUI — Adaptive AI Pipeline for Real-Time Cybersecurity Alert Classification: A Multi-Dataset Approach
Ayoub JIBOUNI — Similarity Redefined: A Robust Metric for Predicting Links in Complex Networks
Anas CHAHID — An Advanced Conversational AI System for Medical Specialty Triage Featuring a RAG-based Dialogue Engine
Abdelmounaim KERKRI — Bridging Semantic Gaps: Cross-Lingual Alignment Through Contrastive Subword Regularization
Abdelmounaim KERKRI — Stochastic-Approximation Reinforcement Learning for Urban Traffic Lights with Low-Cost Sensing
Abdelmounaim KERKRI — Event-Driven Reinforcement Learning on Streams: Drift-Aware Policy Optimization with Reservoir-Constrained Replay

17:00 – 20:00

Session 6: Energy Management & Industrial Optimization

Parallel Sessions — Room 2

Chair: M.A. Kassmi and D. Bahia
Papers
Sidi Omar EL KETTANI — AI-Powered Energy Management Diagnostics: A Comprehensive Framework for Industrial Predictive Maintenance with Large Language Model Integration
Sidi Omar EL KETTANI — Enhanced AI-Powered Energy Management Diagnostics: Expert System Integration with LLM for Predictive Maintenance
Mohammed Ali ARBAOUI — Preliminary design choices for a Green Hydrogen production system
Ali ARBAOUI — Advanced Control Study of a Heat Exchanger: Efficiency Modeling and Analysis for Control Optimization
Hicham TIKAOUI — Vision-Based Angle Detection for Industrial Quality Inspection
Hicham TIKAOUI — Few-Shot Learning Hybrid Approach for Visual Quality Inspection with Limited Data
Hanae EL FAHFOUHI — Enhancing Solar Radiation Forecasting with Informer Architecture and Bayesian Hyperparameters Selection

17:00 – 20:00

Dinner break

Hotel Restaurants

20:00 – 22:00

Day 3 — Saturday, Oct 25

Welcome and Registration

Main Conference Registration

08:00 – 09:00

Session 7: AI in Education, Ethics & Society

Parallel Sessions — Room 1

Chair: A. El Mezouari and J. Oubaha
Papers
Nouhaila CHAREF — Artificial Intelligence in Medical Writing: A Systematic Review of Current Practices
Anas TALHAOUI — Automated Role Classification in Security Policies: A Comparative Study of NLP Approaches
Somaia EL GHAZI — Artificial Intelligence in Medical Education: An Umbrella Review
Manal BOUDIH — NLP-based exploratory study of interviews on blood donation awareness campaigns: evidence from the University of Oujda (2023–2024)
Hicham ARRID — Modeling the Impact of Patient Experience Attributes on Satisfaction: Generalized Additive Models Approach
Boulerhcha BRAHIM — Sentiment analysis in social media with artificial intelligence
Hasnae AMNOUN — AI and Big Data in Marketing Decision-Making: A PRISMA-Guided Systematic Review of Scopus-Indexed Studies
BOUBCHEUR Hanane — Ethical and Pedagogical Dimensions of AI-Assisted Mathematics Teaching for Students with Hearing and Speech Impairments
Kaoutar GHOMARI — Electrolyte Disorders in Emergency and Intensive Care Units at Mohammed VI University Hospital Center Oujda: Prevalence, Seasonality and Associated Factors (Year 2022)
Bilal BOURKHA — Artificial intelligence and hospital management: between strategic imitation and innovation – The case of chain clinics in Morocco
Alaoui KHADIJA — An extensive categorization of triplestores

09:00 – 12:00

Session 8: Smart Cities, Mobility & Environment

Parallel Sessions — Room 2

Chair: H. Barboucha and E.M. Ar-Reyouchi
Papers
Asmae EL MEZOUARI — AI-Driven Radiomics in Oncology: From Early Detection to Personalized Treatment
Meryem ELKADI — Groundwater Level Prediction in the Triffa Plain (Morocco) Using Machine Learning Approaches
Hanae SENBA — Travel Time Optimization in the Old Medina of Fez
Rohit SHITOLE — YOLOv9 Meets CBAM: A Real-Time Smart Traffic Signal System for Emergency Response Optimization
Loubna AZIZI — Toward the Integration of Urban Green Spaces and Smart Technologies: An Approach to Strengthening the Sustainability of Smart Cities
Elmehdi HASSANI — Towards a Paperless Environment: AI for Smart Invoice Processing
Meryem BENKADDOUR — Verification of the First Principle through Joule's Experiments: Determining the Calorie Equivalent in Joules (J) Using Computer-Assisted Experimentation (CAEx)
Salwa KHALYL — An Empirical Comparison of Topic Models: LDA, NMF, and BERTopic Applied to Hotel Customer Reviews

09:00 – 12:00

Closing Ceremony

Conference Hall

12:00

Meet Our Committees

The dedicated team of professionals organizing and guiding ICSMAI 2025

HONORARY COMMITTEE

Mr. Yassine ZARHLOULE, President of Mohammed Premier University, Oujda, Morocco
Mr. Farid EL HEBIL, Director of National School of Applied Sciences, Oujda, Morocco
Mr. El Bekkay MAAROUF, Dean of Faculty of Sciences Oujda, Morocco
Mr. Khalid SERRAJ, Dean of the Faculty of Medicine and Pharmacy, Oujda, Morocco
Mr. Idriss DRIOUCHI, Dean of the Faculty of Legal, Economic and Social Sciences, Oujda, Morocco
Mr. EL HOUSSINE OUCHNI, Dean of the Faculty of Letters and Human Sciences, Oujda, Morocco
Mr. Mohammed BARBOUCHA, Director of Ecole des Hautes Etudes d'Ingénierie, Oujda, Morocco

GENERAL CHAIR

Pr. Kamal GHOUMID, ENSAO, Oujda, Morocco

GENERAL CO-CHAIRS

Pr. Mohamed LAZAAR, ENSIAS, Rabat, Morocco
Pr. Khalid HADDOUCH, ENSAF, FEZ, Morocco
Pr. Réda YAHIAOUI, Marie and louis Pasteur University, France
Pr. Omar ELMAZRIA, Université de lorraine , Nancy, France

LOCAL ORGANIZING COMMITTEE

H. Barboucha, ENSAO, Oujda, Morocco
S. Daoudi, FSO, Oujda, Morocco
O. Sefraoui, ENSAO, Oujda, Morocco
H. Bouali, ESTO, Oujda, Morocco
M.A. Madani, ENSAO, Oujda, Morocco
D. Bahia, FSO, Oujda, Morocco
A. Naji, ENSAO, Oujda, Morocco
R. Malek, ENSAO, Oujda, Morocco
A. Kerkri, ENSAO, Oujda, Morocco
R. Naciri, ENSAO, Oujda, Morocco
A. El Mezouari, ENSAO, Oujda, Morocco
M. Saidi, Ex S/G santé publique, Oujda, Morocco
H. Benhaddouh, FMPO, Oujda, Morocco
A. KERKOUR ELMIAD, FS, Oujda, Morocco
M. Yandouzi, ENSAO, Oujda, Morocco
S. Chabel, EST Guelmim, Université Ibn Zohr, Morocco

STUDENT COMMITTEE

R. Ghafir, UMP, Oujda, Morocco
R. Baba, UMP, Oujda, Morocco

TECHNICAL PROGRAM COMMITTEE

Mrunal Gangrade VP JPMorgan Chase & Co. Floride, USA
I. LAJOIE, Marie and louis Pasteur University, France
Navom Saxena, Meta, New York, USA
F. AUBER, Marie and louis Pasteur University, France
Sunil Kumar Gurram, Californie, USA
Ranadheer Charabuddi Nutrien, USA
Bhavnish Walia, Amazon, New York City USA
Banani Mohapatra, Walmart, San Francisco, USA
Chaitanya Reddy, Dallas , USA
Naveen Kolli, Bank of America Texas, USA
A. Moustefaoui, Montbebilart. Marie and louis Pasteur University, France
B. ALAOUI-SOSSÉ, Marie and louis Pasteur University, France
K. CETINKAYA, Karabuk University, Turkey
Divyadharshini Karthikeyan, Amazon, Canada
S. YEVSEIEV, Kharkiv Polytechnic Institute, Ukraine
L. BEKIROVA, ASOIU Baku, Azebaidjan
A. G. Armada, Universidad Carlos III de Madrid, Spain
G. VARSHNEY, JSS Academy of Technical Education Noida, UP, India
A. KHARe, Sharda University, Greater Noida, India
S. VARSHNEY, Sharda University, Greater Noida, India
P. K. RAJPUT, UPES, Dehradun, India
S. Daoudi, FSO, Oujda, Morocco
O. Sefraoui, ENSAO, Oujda, Morocco
H. Bouali, ESTO, Oujda, Morocco
M.A. Madani, ENSAO, Oujda, Morocco
D. Bahia, FSO, Oujda, Morocco
A. Naji, ENSAO, Oujda, Morocco
R. Malek, ENSAO, Oujda, Morocco
A. Kerkri, ENSAO, Oujda, Morocco
A. El Mezouari, ENSAO, Oujda, Morocco
R. Naciri, ENSAO, Oujda, Morocco
H. Benhaddouh, FMPO, Oujda, Morocco
Y. Bentata, FMPO, Oujda, Morocco
M. Yandouzi, ENSAO, Oujda, Morocco
M. Grari, ESTO, Oujda, Morocco
M.A. Moutaouekkil, ENSAO, Oujda, Morocco
E. YUSIFLI ATISOL Paris, France
M. ABBOUD-ABID ENP, Oran, Algeria
E-M. AR-REYOUCHI, SNRT, Morocco
N. DERGUINI, ENS de Kouba, Algeria
M. KADIC, Marie and louis Pasteur University, FEMTO-ST, France
F. KARDOUS, ENSTA, Tunis, Tunisia
A. SUBASI, Univ. Jeddah, Saudi Arabia
S. MIAN QAISAR, LINEACT, CESI Eng School, France
S. ZHGOON, Univ. Russia, Moscow, Russia
C. LEPERS, INT Paris, France
A. BOUKERCH, Ottawa Univ., Canada
F. BELKACEM, L.I.S.I.C., FEI, USTHB, Algeria
L. FERHAT-HAMIDA, L.I.S.I.C, FEI, USTHB, Algeria
A. TELMAN, Baku Institut, Academician, Azerbaijan

F. SADIKOGHLU, Univ. Nicosia, Cyprus
M. FARHAT, UWI, Mona, FST, Jamaica
F. BENKHALDOUN, Sorbonne Paris Nord University, France
A. TALBI, Centrale Lille, France
A. KERKOUR ELMIAD, FS, Oujda, Morocco
B. EL MAHDAWI, Engineering Technical College Bagdad, Irak
C. DROCOURT, UPJV, Amiens, France
D. DURAND, UPJV, Amiens, France
N. KERZAZI, ENSIAS, Rabat, Morocco
M. A. KASMI, FS, Oujda, Morocco
I. HAMZAOUI, Univ. Valencience, France
M. UMAR KHAN, COMSATS University, IslamAbad, Pakistan
A. MOKHTARI, Univ. Gronoble, France
M. Zeryouh, ENSA, Oujda, Morocco
K. Alaoui, ENSA, Oujda, Morocco
J. Oubaha, ENSA, Oujda, Morocco
M. JEYAR, ESTO, UMP, Oujda, Morocco
M. ABBOUD-ABID ENP, Oran, Algérie
I. KISSAMI, Mohamed VI Polytechnic University, Morocco
M. FAYAD, Marie and louis Pasteur University, France
N. KHARMOUM, CNRST, Rabat, Morocco
R. CHIKH, ENSA, Oujda, Morocco
A. ABBADI, ENSA, Oujda, Morocco
O. MOUSSAOUI, ESTO, UMP, Oujda, Morocco
K. HABOUBI, ENSA, Al Hoceima, Morocco
F. DIMANE, ENSA, Al Hoceima, Morocco
A. ESSADEK, FS, Oujda, Morocco
B. Al-Mahdawi, TCE, MT University, Baghdad, IRAQ
A. Al-Azzawi, TCE, MT University, Baghdad, IRAQ
A. Abdulazeez, CS, Al-Mustansiriyah University, Baghdad, IRAQ
A. BENLGHAZI, ENSAO, Oujda, Morocco
E. H. SEBBAR, FMPO, UMP, Oujda, Morocco
D. EL MOUJTAHIDE, FMPO, UMP, Oujda, Morocco
A. SADDARI, FMPO, UMP, Oujda, Morocco
M Benheddi, FMPO, UMP, Oujda, Morocco