

International Conference on
**Artificial Intelligence
and its Practical Applications
in the Age of Digital Transformation**

2nd Edition

Organized by the Faculty of Sciences and Techniques
Nouakchott University, Nouakchott, Mauritania

Under the High Patronage of Ministry of Higher Education and Scientific Research
& the Ministry of Digital transition and Administrative Modernization

20-22 OCTOBER 2025

♀ Azalai Hôtel, Nouakchott-Mauritania

Strategic Partners



Scientific Collaborators



Main Sponsors



Program

Time	Monday, 20 October 2025
8h30-9h00	Reception and Registration of Participants
9h00-10h00	Opening & Welcome Session: ➤ I2COMSAPP Representatives: Prof. Yahya Mohamed El Hadj & Prof. Fatimetou Med Saleck ➤ The President of Nouakchott University: Prof. Ali Mohamed Salem Boukhary ➤ Words from Strategic Partners (5 minutes each): ○ ALECSO: Prof. Mohamed Ould Amar, General Director. ○ COMSTECH: Prof. Iqbal Chaudhary, Coordinator General of COMSTECH ○ GIZ: Mrs. Magali Mander, Country manager Giz Mauritania. ➤ The Ministry of Digital Transformation (MTNMA): Mr. Ahmed Salem Bedde ➤ The Ministry of Higher Education (MESRS): Prof. Yacoub Ould Moine
10h00-10h15	Coffee Break
10h30-11h15	Plenary Session by Prof. Habib Zaidi Geneva University, Switzerland <i>Adventures in Deep Learning-Powered Multimodal Medical Imaging Wonderland</i>
11h15-12h00	Discussion Panel: <i>AI Ethics in Education — An Open Dialogue with Experts</i> <i>Moderated by: Prof. Fouzi Harrag</i>
12h00-12h45	<i>AI Governance and Ethics in Mauritania's National Artificial Intelligence Strategy (MTNMA)</i> <i>Presented by: Mr. Thierno BARO</i>
12h45-13h45	Prayer and Lunch Break
13h45-14h30	Discussion Panel: <i>Future of AI in Education: How AI Is Shaping the Education of Tomorrow</i> <i>Moderated by: Prof. Aniss Koubaa</i>
14h30-14h50	<i>Infrastructure Supporting AI Solutions in Mauritania</i> <i>Presented by: Prof. Ahmed Amou El Arby</i>
14h50-15h00	Coffee Break
15h00-15h45	Plenary Session by Prof. Imed Zitouni Google, USA <i>The LLM Revolution: Shaping Digital Transformation with Generative AI</i>
15h45- 16h45	<i>AI Research Projects at Nouakchott University and Its I2COMSAPP Collaborators</i> <i>Moderated by: Mr. Mohamed Lemine Elembitaleb</i>

International Conference on
**Artificial Intelligence
and its Practical Applications
in the Age of Digital Transformation**

2nd Edition

Organized by the Faculty of Sciences and Techniques
Nouakchott University, Nouakchott, Mauritania

Under the High Patronage of Ministry of Higher Education and Scientific Research
& the Ministry of Digital Transition and Administrative Modernization

20-22 OCTOBER 2025

♀ Azalati Hôtel, Nouakchott-Mauritania

Strategic Partners



Scientific Collaborators



Main Sponsors



Program

Time	Tuesday, 21 October 2025		
8h30-9h00	Reception and Registration of Participants		
9h00-9h45	Plenary Session by Prof. Eyad Elyan Robert Gordon University, UK <i>Practical and Affordable AI: Strategies and Practical Lessons for Sustainable Digital Transformation in Developing Regions</i>		
9h45-10h00	Coffee Break		
10h00-11h00	Paper Session 1 (ROOM 1): Mohamed Derrich - TOPIC 1: Machine Learning and Intelligent Systems (ML&IS). - PIDs: 12, 23, 28, 32.	Paper Session 2 (ROOM 2): Fouzi Harrag - TOPIC 2: NLP and Comp. Linguistics (NLP&CL). - PIDs: 5, 13, 26, 39.	Paper Session 3 (ROOM 3): Mohamed EL Hassen - TOPIC 6: Smart Systems and Internet of Things (SS&IoT). - PIDs: 14, 38, 1, 45.
11h00-12h00	Papers Session 4 (ROOM 1): Moussa Demba BA - TOPIC 1: ML & IS (2). - PIDs: 44, 56, 76, 49, 7.	Paper Session 5 (ROOM 2): Sidi Biha - TOPIC 2: NLP&CL (2) - PIDs: 55,11, 57, 46.	Paper Session 6 (ROOM 3) Moustapha El Aoun - TOPIC 6: SS & IoT (2) - PIDs: 62, 65, 74, 8(Topic 4)
12h00-12h15	Coffee Break		
12h15-13h15	Paper Session 7 (ROOM 1): Med El hacen Med Dilla - TOPIC 3: Human-Computer Interaction and Educational Technology (HCI&EduTec) - PIDs: 54, 43, 17, 15.	Paper Session 8 (ROOM 2): Mohamed El Khalifa - TOPIC 2: NLP&CL (3) - PIDs: 61,63, 64, 67.	Paper Session 9 (ROOM 3) Mohamed Lamine Diakité - TOPIC 4: Healthcare Inform. and Biomedical Engineering - PIDs: 22, 35, 40, 58,72.
13h15-14h15	Paper Session 10 (ROOM 1): Mamadou Tourad Diallo - TOPIC 3: HCI & EduTec (2) - PIDs: 24, 27, 29, 47.	Paper Session 11(ROOM 2): Makhlouf Dardour - TOPIC 2: NLP&CL (4) - PIDs: 70,75, 77, 78.	Paper Session 12 (ROOM 3) Abdellah Kouzou - TOPIC 5: Cybersecurity and Information Security - PIDs: 21, 37, 41, 69.
14h15 - 15h00	Prayer and Lunch Break		
15h00 - 16h30	Workshop 2: Emerging Trends in Large Language Models Presenters: a group of expert scientists and professionals from various universities.	Workshop 3: Building an Artificial Intelligence of Things (AIoT) System Presenter: Prof. Mohamed Ould El Hassen	Workshop 1: Harnessing AI for Academic Excellence: A Guide to Economics and Law Presenter: Prof. Cheikh Ould Moulaye
16h30-16h45	Coffee Break		
16h45-18h15	Workshop 2 (Cont.)	Workshop 3 (Cont.)	Workshop 1 (Cont.)

International Conference on
**Artificial Intelligence
and its Practical Applications
in the Age of Digital Transformation**

2nd Edition

Organized by the Faculty of Sciences and Techniques
Nouakchott University, Nouakchott, Mauritania

Under the High Patronage of Ministry of Higher Education and Scientific Research
& the Ministry of Digital transition and Administrative Modernization

20-22 OCTOBER 2025

♀ Azalaï Hôtel, Nouakchott-Mauritania

Strategic Partners



Scientific Collaborators



Main Sponsors



Program

Time	Wednesday, 22 October 2025	
8h30 - 9h00	Reception and Registration of Participants	
9h00-11h00	Supporting Activities for I2COMSAPP'25 Collaborators (ESP, ISCAE, ISGI and SupNum): On-Site Presentations by the Conference Experts	Workshop 4: The Evolution of Urban Information Systems toward Smart Cities: Integrating IoT, Machine Learning, and Practical Applications. Presenter: Prof. Amar Alger Lille University
11h00-11h15	Coffee Break	
11h15-12h00	Supporting Activities for I2COMSAPP'25 Collaborators (Conti.)	Sponsors' Presentations (ROOM 2)
12h00 - 13h00	Discovering Nouakchott University: Campus Visit	
13h30-14h30	Prayer and Lunch Break	
14h30-15h30	Closing Ceremony: - Best Paper Awards presented by Nouadhibou University, - Announcement of the GIZ Competition Winners for the I2COMSAPP'25 Mauritanian Papers and Their Integration into the Startup Support Program (Incubation Program), - Honoring Conference Partners and Sponsors, - Reading the Conference Recommendations, - Official Closing of the Conference.	

International Conference on
**Artificial Intelligence
and its Practical Applications
in the Age of Digital Transformation**

2nd Edition

Organized by the Faculty of Sciences and Techniques
Nouakchott University, Nouakchott, Mauritania

Under the High Patronage of Ministry of Higher Education and Scientific Research
& the Ministry of Digital Transition and Administrative Modernization

20-22 OCTOBER 2025

♀ Azalâi Hôtel, Nouakchott-Mauritania

Strategic Partners



Scientific Collaborators



Main Sponsors



Details of Accepted Papers

PID	Authors	Title	Research Topic
7	Makhlouf Chaouki, Laouar Mohammed Ridda, Sean Eom and Ahmed Mohamed Salem	ScoreCAM- Enhanced Hybrid Vision Transformer and EfficientNet Model for Accurate Diabetic Retinopathy Classification	Topic 1: Machine Learning and Intelligent Systems
12	Chadli Souhila, Ouared Abdelkader and Chadli Abdelhafid	A Cluster-Based Transformer Framework for Olive Production Prediction	Topic 1: Machine Learning and Intelligent Systems
23	Abdulrahman Al-Salehi and Qaedah Mahdi	Systematic Survey on Enhanced techniques of skin cancer classification using deep convolutional neural network.	Topic 1: Machine Learning and Intelligent Systems
28	Faiza Affouri and Rhita Sabri	Machine Learning for in-depth Exploration of the Impact of Microfinance Institutions on Financed Entrepreneurs in the African Continent	Topic 1: Machine Learning and Intelligent Systems
32	Md Zahir Ahmed	Evolving Temporal Logic Formulas Using Dynamic Grammar-Based Learning for Finite Trace Analysis	Topic 1: Machine Learning and Intelligent Systems
44	Fatimatou Bah, Meya Haroune and Cheikh Dhib	A meta-learning approach for Multi-skill Resource-constrained Project Scheduling Problem (MSRCPSP) algorithm selection	Topic 1: Machine Learning and Intelligent Systems
49	Nouf Alotaibi, Hala Alotaibi and Hachemi Bennaceur	Enhanced Ant Colony Optimization Variants for Efficient Task Scheduling in Cloud Environments	Topic 1: Machine Learning and Intelligent Systems
56	Moussa Demba and Meya Harouna	A Hybrid Search Strategy Algorithm for Mining Frequent Itemsets	Topic 1: Machine Learning and Intelligent Systems
76	Mohamed Abderahmane Mohamed Elmoctar, Cheikh Dhib, Mohamed Aly Louly, Emmanuel Néron and Ameer Soukhal	Machine Learning Model for Predicting Bus Arrival Times at Stops	Topic 1: Machine Learning and Intelligent Systems
5	Sara El Ouahabi, Safaa El Ouahabi and El Wardani Dadi	An Optimized LSTM for Moroccan Darija Sentiment Analysis on Social Media	Topic 2: Natural Language Processing and Digital Humanities
11	Reima Aljarf	To Publish or Not to Publish AI-Generated Research Articles in Scholarly Journals: A Perspective from Editors and Publishers	Topic 2: Natural Language Processing and Digital Humanities
13	Sidi Ahmed Maouloud and Cheikh Ba	Image-to-Sequence Models for the Recognition of Text Lines of Maghrebin Handwritten Scripts: New Dataset and New Results	Topic 2: Natural Language Processing and Digital Humanities
26	Rahma Boghale, Mamadou Abdoulaye Aw, Mohamedou Abewa, Aichetou Nemin and Cheikh Seydi Dedaha Mohamed Jedou	A Low-Resource English–Hassaniya Parallel Corpus with Neural Machine Translation Benchmarks	Topic 2: Natural Language Processing and Digital Humanities
39	Narimene Ayat, Fouzi Harrag, Nassir Harrag, Mohamed Deriche and Yahya Mohamed Elhadj	Trustworthy Arabic LLMs: A Multidimensional Survey of Risks, Realities, and Resilience	Topic 2: Natural Language Processing and Digital Humanities
46	Azeddine Elhassouny, Idriss El Abidi and Ziyad Abidate	Transformer-based Quran insight representation framework for ICBIR	Topic 2: Natural Language Processing and Digital Humanities
55	Fatimetou Abdou Vadhil, Mohamed Lemine Salihi and Mohamedade Farouk Nanne	Enhancing Legal Text Processing with AI: Inconsistency Detection, Translation, and Access	Topic 2: Natural Language Processing and Digital Humanities
57	Cheikh Ahmedou Enaha Enaha, Djilit Abdellahi, Mohamed Lemine Ahmed Taleb, Mohamed Abderhman Nanne and Athmane Bakhta	Authentiscore: Stochastic Score Verification and Fine-tuning Strategies for Multi-Model AI Text Detection	Topic 2: Natural Language Processing and Digital Humanities
61	Farouk Chmit, Chaima Chaieb and Hadhemi Achour	Explainable Text-to-SQL Generation: An Overview of Recent Trends and Developments	Topic 2: Natural Language Processing and Digital Humanities

International Conference on
**Artificial Intelligence
and its Practical Applications
in the Age of Digital Transformation**

2nd Edition

Organized by the Faculty of Sciences and Techniques
Nouakchott University, Nouakchott, Mauritania

Under the High Patronage of Ministry of Higher Education and Scientific Research
& the Ministry of Digital Transition and Administrative Modernization

20-22 OCTOBER 2025

♀ Azalai Hôtel, Nouakchott-Mauritania

Strategic Partners



Scientific Collaborators



Main Sponsors



63	Murtadha Alabdulsalam, Wasfi Al-Khatib, Mohammad Amro and Abdulkareem Alzahrani	A Rule-Based Approach for Arabic Poem Meter Classification Using Pairwise Alignment Matching	Topic 2: Natural Language Processing and Digital Humanities
64	Khadhir Bekki, Miloud Rouabhi, Karim Bouamrane and Abdelkader Ouared	Mujeeb: A Hybrid Arabic Chatbot to Enhance Customer Support in Financial Administration Services	Topic 2: Natural Language Processing and Digital Humanities
67	Rim Mokaddem, Chaima Chaieb and Hadhemi Achour	A Review of Textual Data Augmentation Approaches for Arabic NLP	Topic 2: Natural Language Processing and Digital Humanities
70	Laila Lajili, Siwar Gorraab and Hadhemi Achour	Topic Modeling of User-generated Arabic on Social Media: a Systematic Literature Review	Topic 2: Natural Language Processing and Digital Humanities
75	Sana Khayou, Si Lhoussain Aouragh and Karim Bouzoubaa	Fine-Tuning Transformer model with a High-Quality French-Arabic Parallel Corpus of Medical Prescriptions for Domain-Specific Machine Translation	Topic 2: Natural Language Processing and Digital Humanities
77	Mohamed Naseif, Ahmed Elhayek and Anis Koubaa	MIRATH: A Large and Diverse Arabic Manuscript Dataset for Text-Line Segmentation	Topic 2: Natural Language Processing and Digital Humanities
78	Anis Koubaa	From Pre-Trained Language Models to Agentic AI: Evolution and Architectures for Autonomous Intelligence	Topic 2: Natural Language Processing and Digital Humanities
15	Ahlam Marzouqui, Hamid Hrimech, Mohamed Lachgar, and Abdejalil Sakat	Integration of Artificial Intelligence (AI) into virtual reality (VR) environments	Topic 3: Human-Computer Interaction and Educational Technology
17	Touameur Ouissem, Fouzi Harrag, Mohamed Deriche and Yahya Mohamed Elhadj	GNN-Based Academic Performance Prediction with Socio-Demographic Features	Topic 3: Human-Computer Interaction and Educational Technology
24	Abdelkader Ouared, Ahmed Ala Eddine Benali, and Abdelhafid Chadli	Enhancing Farmers' Learning through IoT-based Gamification and Social Awareness	Topic 3: Human-Computer Interaction and Educational Technology
27	Abdelkader Ouared and Ahmed Ala Eddine Benali	Cultivating Self-Regulated Learning in Farmers for Adaptive Agricultural Decision-Making	Topic 3: Human-Computer Interaction and Educational Technology
29	Maria Bounnit and Moulay Abdelaziz Sabti	The use of artificial intelligence in differentiated Instruction using Duolingo and its impact on teaching practices	Topic 3: Human-Computer Interaction and Educational Technology
43	Ahmed Mohamed Lemine, Massra Sabeima, and Mohamedade Farouk Nanne	Novel Recommendation Approach for Resource In Online Learning (Mauritanian Context)	Topic 3: Human-Computer Interaction and Educational Technology
47	Salma Haddoumouloud and Nouhaila Benlakhira	AI-Based Adaptive Learning in Higher Education Impacts on Engagement and Academic Performance	Topic 3: Human-Computer Interaction and Educational Technology
54	Ahmedou Moulaye Idriss, Md Jiddou Sidi Baba, Yahya T'Feil, Md El Moutar Septy, Aboubakry Sow, Sid' Ahmed Limam, El Haj Adde, Abdallahi Abed, Mohamed Alalli Bilal, Fatimetou M. M. Salek, Juan Alzola, Gabor Fishtinger, Mike Halle, Ron Kikinis and Sonia Pujol	Evaluation of Manual and AI-Based Segmentation for Digital Anatomy Atlases Creation	Topic 3: Human-Computer Interaction and Educational Technology
8	Safa Boughougal, Mohamed Ridda Laouar, Abderrahim Siam, Sean Eom and Ahmed Mohamed Salem	Improving Chronic Kidney Disease Diagnosis through Machine Learning and Boruta Feature Selection	Topic 4: Healthcare Informatics and Biomedical Engineering
22	Abdulrahman Al-Salehi, Apl. Prof. Dr.-Ing. Habil. Ayoub Al-Hamadi and Prof Ahmed Al-Dubai	AI-Augmented LiDAR Systems for Contactless Vital Sign Monitoring in Modern Healthcare	Topic 4: Healthcare Informatics and Biomedical Engineering
35	Soumia Zertal, Asma Saighi, Abdellah Kouzou, Nacima Mallel, Mohamed Deriche and Makhlouf Derdour	DBNALLRBM: An Unsupervised Deep Belief Network Framework Using Stacked Restricted Boltzmann Machines for Breast Cancer Prediction	Topic 4: Healthcare Informatics and Biomedical Engineering

International Conference on
**Artificial Intelligence
and its Practical Applications
in the Age of Digital Transformation**

2nd Edition

Organized by the Faculty of Sciences and Techniques
Nouakchott University, Nouakchott, Mauritania

Under the High Patronage of Ministry of Higher Education and Scientific Research
& the Ministry of Digital Transition and Administrative Modernization

20-22 OCTOBER 2025

♀ Azalaï Hôtel, Nouakchott-Mauritania

Strategic Partners



Scientific Collaborators



Main Sponsors



40	Afnan Al-Johani and Mohammed Al-Sarem	Skin Image-Based Monkeypox Classification: A Novel Approach Using Transfer Learning, CBAM, and ANN	Topic 4: Healthcare Informatics and Biomedical Engineering
58	Aminetou Mohamed El Moustapha, Salima Hassairi, Ridha Ejali and Mohameden Farouk Nanne	Integrate a deep AutoEncoder with regression model for pIC50 prediction	Topic 4: Healthcare Informatics and Biomedical Engineering
72	Chafia Kara-Mohamed Hamdi-Cherif, Soumia Dahel, Amina Maabed and Aboubekour Hamdi-Cherif	Comparative Analysis of Explainable Deep Learning Models for Pneumonia Detection in Chest X-rays	Topic 4: Healthcare Informatics and Biomedical Engineering
21	Mohamed Elamine Kheraifia, Abdelatif Sahraoui, Dourdour Makhlof, Abdellah Kouzou, Mohamed Deriche and Moustafa Sadek Kahil	Enhancing Security and Privacy in Smart City Monitoring with Multi-User Encryption and Smart Contracts	Topic 5: Cybersecurity and Information Security
37	Fouzi Harrag, Aya Boumezeur, Maria Dib, Mohamed Deriche and Yahya Mohamed Elhadj	Privacy by Design: A Review of Safeguarding Strategies for LLMs in Critical AI Applications	Topic 5: Cybersecurity and Information Security
41	Karmous Nader, Wadii Jlassi, Mohamed Aoueileyine and Ridha Bouallegue	ML-Driven Framework for Detecting Probing Attacks Against IoT Devices in SDN Environments	Topic 5: Cybersecurity and Information Security
69	Cheikh Abdelkader Ahmed Telmoud	AI for Secure Mobile Payments: A Multi-Layered Framework for Mauritania	Topic 5: Cybersecurity and Information Security
1	El Houssine Amraouy, Ali Yahyaouy, Hamid Gualous, Hicham Chaoui and Sanaa Faquir	Q-Learning Based Optimization of Autonomous Electric Vehicle Behavior in Smart Grids for Sustainable Urban Mobility	Topic 6: Distributed Systems and Smart Computing
14	Cheikh Abdelkader Ahmed Telmoud, Mouhamedou Cheikh Tourad, Mohamed Lachgar, Hamza Briak and Mohamedade Farouk Nanne	Advancing Precision Agriculture in Mauritania: Integrating AI-Driven Rice Yield Prediction with IoT-Based Climate Monitoring	Topic 6: Distributed Systems and Smart Computing
38	Asma Saighi, Soumia Zertal, Ahlem Nasri, Zakaria Laboudi, Abdellah Kouzou, Mohamed Deriche and Makhlof Dourdour	Agentic AI-based Architecture for E-learning Multimedia Service Selection in Cloud-Edge Environments	Topic 6: Distributed Systems and Smart Computing
45	Azeddine El Hassouny	Groundwater management using artificial intelligence and satellite imagery	Topic 6: Distributed Systems and Smart Computing
62	Mohamed Lemine Ahmed Sidi, Hafedh Mohamed Babou and Cheikh Dhib	Deep Learning Approaches for Solving the One-to-One SkewGram Problem	Topic 6: Distributed Systems and Smart Computing
65	Jlassi Wadii, Karmous Nader, Aoueileyine Mohamed Ould-Elhassen and Bouallegue Ridha	An Innovative Dataset for Evaluating Sybil Attacks in SDN Networks	Topic 6: Distributed Systems and Smart Computing
74	Fatima Zahraa Tatou and Abdellah Yousfi	Sectoral Energy Consumption and Economic Growth: A Comparative Analysis for Morocco and France	Topic 6: Distributed Systems and Smart Computing