جامعة سطيف 1 - فرحات عباس

Setif 1 University - Ferhat ABBAS

Faculty of Sciences - Computer Science Department

2nd Scientific Day

AI4IoT

Artificial Intelligence for Internet of Things

MORNING SESSION | NOVEMBER 19, 2026 | Doctoral Schools Auditorium

08:00 – 09:00		**REGISTRATION & OPENING CEREMONY**	**08:00- 08:30 Registration** **08:30- 09:00 Opening Ceremony**
09:00 – 09:45		**Pr. ABDULREZAK BESSAM** University of Sherbrooke, Canada	**AMI-Lab: Bridging IoT, AI & Healthy Aging**
10:00 – 10:30		**COFFEE BREAK / POSTER SESSION 1**	Refreshments Poster presentations & discussion
10:30 – 11:15		**Pr. DERDOUR MAKHLOUF** Oum el Bouaghi University	**The Real Challenges of AI Reliability**
11:30 – 12:15		**Pr. MOUSSAOUI ABDELOUAHAB** Setif 1 University – Ferhat Abbas	**Vers l'IA Générale : entre défis scientifiques et limites technologiques**
12:30 – 13:30		**LUNCH**	

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AFTERNOON SESSION | NOVEMBER 19, 2026 | Doctoral Schools Auditorium

13:30 – 14:15		**Dr. Ben Atia Okba** Université Marie et Louis Pasteur - France	**Beyond Chatbots: Agentic AI for Autonomous and Secure IoT Systems**
14:15 – 15:00		**Pr. Lakhfif Abdelaziz** Setif 1 University – Ferhat Abbas	**Agentic AI: Foundations, Architectures, and Open Challenges**
15:00 – 15:30		**COFFEE BREAK / POSTER SESSION 2**	Refreshments Poster presentations & discussion
15:30 –16:15		**Dr. Alti Adel** Setif 1 University – Ferhat Abbas	**Deep Learning and IoT in e-Health Service Sustainability: Predicting Patient No-Shows**
16:15 – 16:45		**M. Louahche Rabah** Setif 1 University – Ferhat Abbas	**Smart Health Guardian System**
16:45 – 17:15		**DISTRIBUTION OF CERTIFICATES- CLOSING CEREMONY - GROUP PHOTO**	

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PLENARY SESSION



Pr. Abdulrezak Bessam

Director of Ambient Intelligence Laboratory (AMI-Lab),
University of Sherbrooke,
Canada

PLENARY TALK

AMI-Lab: Bridging IoT, AI & Healthy Aging

Biography

Dr. Bessam Abdulrazak is a Full Professor of Computer Science at the Université de Sherbrooke (Québec, Canada), where he directs the Ambient Intelligence Laboratory (AMI-Lab). He is active research at the Research Center on Aging (CdRV), the Interdisciplinary Center for Research in Health Informatics (CIRIUS), and the Québec Network for Research on Aging (RQRV), and serves as Track Chair for the Québec Digital Health Network (RSN). He completed his postdoctoral training at the University of Florida (USA) and holds a PhD from Telecom SudParis (France), with a dissertation on Human-Machine Interaction for people with disabilities — foundational work that seeded his career-long focus on assistive technology — an MSc in Robotics from Université Pierre & Marie Curie – Paris VI, and a BSc in Electronics Engineering (State engineer) from University of Science and Technology – Houari Boumediene (USTHB) (Algeria). His research focuses on IoT, Ambient Intelligence, Ubiquitous Computing, Digital Health, and Assistive Technology for older adults and people with disabilities — with a distinctive commitment to real-world deployment and field evaluation rather than laboratory-only prototyping. What sets his work apart is an end-to-end translational philosophy: technology is not simply designed, but deployed and evaluated in real environments — homes, senior residences, and health facilities — to ensure it reflects the lived reality of its users. He is co-founder of the International Conference on Smart Living and Public Health (ICOST), one of the flagship global venues bridging computing and public health, editor of more than 12 books published with Springer-Verlag and John Wiley & Sons, and author of over 200 peer-reviewed publications.

Abstract

Ambient Intelligence in smart environments — houses, hospitals, neighborhoods and cities — harnesses the Internet of Things (IoT), embedded computers, and multimodal sensors to deliver contextual, proactive and personalized services. At its core lies advanced data analysis enabling machines to perceive, reason, learn and adapt in real time, backed by probabilistic models and statistical inference engines that estimate user state and behavior from noisy, heterogeneous sensor streams, processed across distributed edge-cloud architectures that bring computation closer to the data source for low-latency, privacy-aware inference. These environments empower people through unprecedented access to information and intelligent assistance. Older adults and people with disabilities will benefit from AI-driven technologies supporting daily activities and well-being. Advanced models and time-series analysis underpin behavioral pattern recognition from longitudinal sensor data, enabling robust inference under uncertainty. Federated learning enables these models to be trained collaboratively across distributed devices and care sites without centralizing sensitive personal data, preserving privacy while improving generalization across diverse populations. Combined with predictive analytics and ubiquitous sensing, health telematics can transform diagnosis, therapy and assistance. Agents can anticipate health deterioration and enable timely interventions. Laboratory results can be enriched by inferred behavioral patterns and anomaly detection from IoT data streams, with statistical process control flagging clinically significant deviations from personalized baselines. Distributed stream processing frameworks orchestrate real-time data flows from thousands of concurrent sensors, ensuring scalable, fault-tolerant inference at the population level. Dr. Abdulrazak will present AMI-Lab's interdisciplinary work spanning activity and behavior recognition, intelligent health monitoring and intelligent assistive systems — from smart homes for older adults to enhanced self-reported data pipelines, using statistical harmonization and data fusion to integrate heterogeneous sources. A federated, distributed deployment model underpins these systems, allowing models to be updated continuously at the edge while aggregating insights centrally — without compromising individual privacy. These technologies operate indoors and outdoors, forming a continuum of intelligent, person-centered care grounded in reproducible, evidence-based methodology.]

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PLENARY SESSION



Pr. Derdour Makhlouf

IEEE Senior Member, Director of Artificial Intelligence Laboratory Oum el Bouaghi University

PLENARY TALK

The Real Challenges of AI Reliability

Biography

Le Pr. Makhlouf Derdour est professeur des universités en informatique à l'Université Larbi Ben M'hidi d'Oum El Bouaghi (Algérie). Titulaire d'un doctorat en informatique en cotutelle entre l'Université Badji Mokhtar d'Annaba et l'Université de Pau et des Pays de l'Adour (UPPA), il possède un parcours scientifique riche, jalonné de responsabilités de recherche de premier plan. Il a notamment été chef d'équipe « Pervasive Computing » (Informatique Pervasive) au sein du Laboratoire de Recherche en Informatique (LRS) d'Annaba, avant d'occuper son poste actuel de directeur du Laboratoire d'Intelligence Artificielle et d'Objets Autonomes (LIAOA). Spécialiste reconnu en intelligence artificielle, objets autonomes, informatique pervasive, architectures logicielles, cloud computing et vision par ordinateur, il est l'auteur de nombreuses publications internationales indexées et a encadré plusieurs thèses de doctorat. Il est également le fondateur et président (General Chair) de la conférence internationale PAIS (International Conference on Pattern Analysis and Intelligent Systems), un événement scientifique majeur organisé à Oum El Bouaghi et publié dans IEEE Xplore.

Abstract

Progress in AI is still primarily measured by its capabilities—such as benchmark scores or average accuracy. However, once a system is deployed in a critical context—whether in healthcare,

industry, finance, or through autonomous agents—its reliability becomes the deciding factor for its adoption. This keynote explores how high average performance can mask inconsistent responses, extreme sensitivity to minor variations, data drift, and cascading failures within agentic systems. We will examine how to shift from a model-centric approach to system-level assurance: measuring consistency, robustness, and calibration; monitoring for drift during production; integrating AI with deterministic guardrails; and ensuring a human remains accountable for decision-making. The presentation draws on examples from software-based medical devices, where reliability is not merely a desirable feature, but a prerequisite for market entry.

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Pr. Moussaoui Abdelouahab

Computer Science Departement, Faculty of Sciences Setif 1 University – Ferhat Abbas

PLENARY TALK

Vers l'IA Générale : entre défis scientifiques et limites technologiques

Biography

Prof. Abdelouahab Moussaoui is a teacher/researcher at Ferhat Abbas Sétif 1 University in Sétif, Algeria, where he obtained the rank of Full Professor in 2011. He earned his degree in computer engineering in 1991 from the Department of Computer Science at the University of Houari Boumediene's Sciences and Technology (USTHB) in Algeria. He also received a Master's degree in aerospace engineering in 1992 from the University of Sciences and Technology in Oran (USTO). In 1995, he earned a Master's degree in artificial intelligence from the University of Sidi Belabbes, Algeria, and a Ph.D. in artificial intelligence and medical imaging from Ferhat Abbas University, Algeria, in 2005, where he attained the status of Full Professor in computer science. He is referenced in several renowned international journals such as Springer and Elsevier. His research focuses on the fields of machine learning, deep learning, clustering algorithms, and applications of multivariate image classification in biological and medical domains. He has published a substantial number of scientific articles, participated in numerous seminars and scientific conferences as a reviewer, and supervised many doctoral theses in the field of supervised and unsupervised deep learning applied to the biomedical field (medicine and biology). He has also worked extensively on pattern recognition algorithms, complex data exploration, physiological signal analysis, and bioinformatics. In his current work, Professor Abdelouahab Moussaoui is interested in self-supervised learning techniques, representation learning, as well as semantic image segmentation

techniques through visualization and interpretability techniques for convolutional neural networks in deep learning (CAM, Grad-CAM, CBAM, etc.).

Abstract

L'IA ambiante promet une symbiose humain-machine, mais se heurte à la rigidité des systèmes face à l'imprévisibilité du réel. Elle doit être flexible, adaptative, contextuelle et multi-tâches, et composer avec des données imparfaites. Le few-shot learning, le meta-learning et le self-supervised learning répondent partiellement à ces contraintes, tandis que l'orchestration dynamique des paradigmes permet à l'IA de sélectionner la stratégie adaptée et de quantifier son incertitude. Ces avancées transforment la médecine personnalisée, l'industrie 4.0 et l'éducation adaptée. Sur le plan scientifique, des percées majeures ont été revendiquées en septembre 2026 : OpenAI a annoncé que son modèle interne, plus puissant que GPT-6 Astra, avait établi une preuve de singularité pour les équations de Navier-Stokes avec force externe, mobilisant environ 10 000 agents pendant 88 heures . Une formalisation en Lean a été publiée, mais OpenAI a précisé ne pas vouloir réclamer le prix du Millénaire . La communauté mathématique a toutefois soulevé des objections décisives : la preuve concerne les variantes forcées (énoncés C et D), non les équations physiques non forcées (A et B), et un audit d'octobre 2026 a révélé des divergences entre le manuscrit et le code Lean vérifié, notamment sur la Lemma 8.6 . Ce résultat illustre à la fois la puissance des approches multi-agents et leurs limites épistémiques : la vérification formelle ne garantit pas la fidélité sémantique au problème physique visé. L'inspiration bio-physique nourrit par ailleurs des pistes prometteuses. Les modèles de diffusion, fondés sur un processus inverse de débruitage inspiré de la physique hors équilibre, dominent la génération d'images et étendent leur usage à l'inférence scientifique : inférence de paramètres avec quantification d'incertitude en diffraction électronique, génération de données multi-omiques, ou prédiction en magnétohydrodynamique. Les machines de Boltzmann, modèles énergétiques issus de la thermodynamique, offrent un cadre théorique profond mais restent difficiles à entraîner ; des liens existent entre machines de Boltzmann restreintes et diffusion via la brisure de symétrie . Le cerveau consomme environ 20 watts là où les grands modèles en consomment des millions, et la connaissance incarnée, l'émotion et la causalité demeurent des frontières que ni la biologie imitée ni la physique statistique ne suffisent à franchir. Les limites persistent néanmoins : attaques adversariales, hallucinations, raisonnement multi-étapes fragile, sensibilité aux distributions, interprétabilité insuffisante. GPT-6 Astra lui-même, malgré des scores élevés, voit ses résultats contestés en évaluation indépendante et reste incapable de masquer certains raisonnements complexes . Flexibilité et robustesse ne sont pas synonymes : l'orchestration dynamique et l'inspiration bio-physique améliorent l'adaptation, mais ne corrigent pas les failles cognitives de fond.

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PLENARY SESSION



Dr. Ben Atia Okba

Lecturer – Researcher ; AI & Cybersecurity Expert ; Senior Software Engineer ; Professional Trainer Université Marie et Louis Pasteur - France

PLENARY TALK

Beyond Chatbots: Agentic AI for Autonomous and Secure IoT Systems

Biography

Dr. Okba Ben Atia is a lecturer-Researcher at Université Marie et Louis Pasteur, France, with over 10 years of experience in research and industry. He specializes in Artificial Intelligence, IoT, Cybersecurity, and smart systems, and has guides Master’s and PhD students in research and innovation.

Abstract

The workshop will explore recent advances in Agentic AI, Digital Twins, and intelligent IoT systems, with a particular focus on autonomous decision-making, cybersecurity, and emerging research opportunities in AI, IoT, and cybersecurity. It is designed for Bachelor's, Master's, and PhD students, combining advanced concepts, practical demonstrations, and interactive discussions.

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PLENARY SESSION



Pr. Lakhfif Abdelaziz

Head of Computer Science Departement, Faculty of Sciences, Setif 1 University – Ferhat Abbas

PLENARY TALK

Agentic AI: Foundations, Architectures, and Open Challenges

Biography

Prof. Abdelaziz LAKHFIF Received the Ph.D. degree in Artificial Intelligence from Badji Mokhtar University (BMUA), Annaba, Algeria, in 2016 and the university habilitation in 2019, from Sétif 1 University, Algeria. He is currently a full Professor and the Head of Computer Science Department, at Sétif 1 University. He published some papers in international conferences and journals. His research interests include Artificial Intelligence, Arabic NLP, Sign Language generation, Cognitive Linguistics, Machine Learning, Text & Data Analytics, and Pattern Recognition.

Abstract

Agentic Artificial Intelligence (Agentic AI) represents a paradigm shift from traditional prompt-driven AI models toward autonomous, goal-oriented agents that are capable of reasoning, planning, decision-making, interacting with external tools, and adapting through feedback. This presentation introduces the fundamental concepts, principles, and architectural foundations of Agentic AI, highlighting its distinguishing characteristics compared to conventional Large Language Model (LLM)-based models and chatbots. The talk explores key capabilities, including reasoning, planning, memory, tool utilization, autonomy, and multi-agent collaboration, alongside the operational mechanisms that enable agents to execute complex tasks, while addressing critical

challenges related to reliability, security, scalability, privacy, hallucinations, evaluation, and human oversight.

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PLENARY SESSION



Dr. Alti Adel

Computer Science Departement, Faculty of Sciences Setif 1 University – Ferhat Abbas

PLENARY TALK

Deep Learning and IoT in e-Health Service Sustainability: Predicting Patient No-Shows

Biography

Dr. Adel ALTI is an associate professor and HDR at the Computer Science Department of the University of Ferhat Abbas Setif-1 (UFAS-1). He obtained a Ph.D. degree in software engineering from UFAS-1 University of Setif-1, Algeria, in 2011. He is currently the head of the Smart Semantic Context-aware Services research group LRSD. He supervised 9 Ph.D. thesis and was involved in more than 14 Ph.D. defenses. Adel invests in software generation, software development, middleware, distributed interfaces, environmental information, secure industrial IoT and microservices, context and QoS management and more reliable and distributed information. He published numerous international journal articles and book chapters on these subjects.

Abstract

Healthcare has become a globally significant industry with complex economic structures related to costs and administration. To address these challenges, the integration of Internet of Things (IoT) and Artificial Intelligence (AI) is crucial for improving sustainability. This study introduces IoT-enabled deep learning-based approach to optimize eHealth service delivery by improving operational efficiency, reducing costs, and supporting environmental sustainability. By combining IoT patient telemetry with a Convolutional Neural Network (CNN) model and improved scheduling

is applied to predict patient no-shows for hospital appointments, the framework achieves an 18.5% reduction in costs, 18.75% improvement in environmental sustainability, and an 8.24% enhancement in patient experience. These findings demonstrate that deep learning can significantly improve both the efficiency and sustainability of modern healthcare systems.