



SPECIAL SESSION 9

Efficient Edge AI: Models, Optimization, and Applications

Session description :

This special session focuses on recent advances in efficient Edge Artificial Intelligence (Edge AI), addressing the need to deploy intelligent systems on resource-constrained platforms such as embedded systems, IoT devices, and edge computing infrastructures. With the growing demand for real-time, autonomous, and scalable applications across domains including healthcare, smart agriculture, autonomous systems, and industrial automation, Edge AI has become a key enabler of next-generation intelligent solutions.

This session particularly highlights lightweight AI models, hardware-aware optimization techniques (e.g., pruning, quantization, and FPGA/SoC acceleration), and scalable distributed intelligence for efficient edge deployment. It also emphasizes the integration of semantic technologies and lightweight domain ontologies to enhance intelligence, and explainability. Ontology-driven approaches enable structured knowledge representation, semantic reasoning, and context-aware decision-making in distributed environments, thereby supporting hybrid AI systems that combine symbolic and data-driven methods while respecting edge resource constraints. In addition, the session will address emerging challenges related to reliability, interpretability (XAI), and real-world deployment constraints. It aims to bring together researchers from academia and industry to propose innovative and practical solutions for building efficient, robust, and semantically enriched Edge AI systems.

Session chairs :

- **Soulef BOUAAFIA**, Kairouan Univ., TN
- **Wided BEN ABID**, Kairouan Univ., TN

Topics of interest (not limited to) :

- Lightweight and high-performance AI models for edge deployment;
- Hardware-aware AI optimization;
- Real-time and low-latency inference on resource-constrained platforms;
- Real-world deployment case studies (healthcare, smart agriculture, autonomous systems, industrial automation);
- Interpretability and trust in real-time AI applications (e.g., Grad-CAM, LIME);
- Distributed and collaborative edge intelligence;
- Deployment and benchmarking of AI models on resource-constrained devices;
- Real-time perception and decision-making systems;
- Integration of AI with IoT and cyber-physical systems;
- Lightweight ontologies for knowledge representation on edge devices;
- Semantic reasoning and context-aware decision-making under resource constraints;

Important Dates



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