

The *ITU Journal on Future and Evolving Technologies (ITU J-FET)* is an international journal providing complete coverage of all communications and networking paradigms, free of charge for both readers and authors. The ITU Journal considers yet-to-be-published papers addressing fundamental and applied research. It shares new techniques and concepts, analyses and tutorials, as well as learning from experiments and physical and simulated testbeds. It also discusses the implications of the latest research results for policy and regulation, legal frameworks, the economy and society. This publication builds bridges between disciplines, connects theory with application, and stimulates international dialogue. Its interdisciplinary approach reflects ITU's comprehensive field of interest and explores the convergence of ICT with other disciplines. The ITU Journal welcomes submissions at any time, and on any topic within its scope.



6th Special issue on **AI/ML solutions in 6G and AI-native networks** Call for papers

As the digital world moves towards more complex and powerful network infrastructures, AI and ML are increasingly seen as critical enablers for improving efficiency, scalability, and performance across all network layers. These technologies are instrumental in addressing the growing demands for ultra-low latency, high data rates, massive connectivity, and energy-efficient networks that 5G/6G and future networks promise.

Following the successful publication of five special issues on the theme of AI/ML in 5G and future networks, the ITU Journal on Future and Evolving Technologies (ITU J-FET) is launching this new call for papers.

In recent years, AI and ML are moving from enablers of single-use case solutions to ubiquitously deployed technologies for multiple use cases, such as singular and multi-agentic approaches. Other examples are part of network support and validation tools, such as digital twins. A shift is also being seen from the deployment of pre-trained models, to models which are being trained or updated within the network to respond to dynamic operational environments or differing hardware resources across the network. Together, this is supporting networks where AI is a first-class entity in its planning, management, and operation: *AI-native networks*.

This special issue invites papers that offer novel insights and cutting-edge solutions for using AI and ML to revolutionize communication networks, accelerating innovation in 5G evolution, 6G vision, and future network systems. We welcome contributions that push the boundaries of current AI/ML applications in network design, optimization, and management.



Suggested topics (but not limited to):

AI-native architecture and network automation	<ul style="list-style-type: none">• AI-native networks: architectural design and implementation of fully autonomous, zero-touch network orchestration (RAN, Core, Edge)• Generative AI (GenAI) and LLMs for telecom: using large language models and retrieval augmented generation (RAG) for intent-based networking, automated configuration, and predictive network troubleshooting• Distributed intelligence and agentic AI for communication networks: collaborative AI systems, multi-agent decision making, decentralized optimization, and autonomous coordination across RAN, Core, Edge, and heterogeneous network environments• Network Digital Twins (NDTs): creation and operation of scalable NDTs using technologies like graph neural networks (GNNs) for fault analysis, performance prediction (QoS/QoE), and network planning• AI for Open RAN (O-RAN) systems: development and evaluation of intelligent xApps and rApps for both real-time and non-real-time optimization within the RAN intelligent controller (RIC)• Autonomy and self-adaptive networks: networks which are able to self-govern and adapt to dynamic environments, where software defined or AI-native infrastructure can support runtime adaptation driven by AI or ML approaches
AI/ML for 6G core and physical layer innovation	<ul style="list-style-type: none">• AI for 6G physical layer: ML solutions for Terahertz (THz) communication, intelligent channel modelling, Massive MIMO, and ultra-accurate beamforming in high-frequency bands• AI for 6G MAC layer: ML solutions for schedulers, link adaptation, resource allocation, spectrum sharing, overhead reduction, handover management• Integrated Sensing And Communication (ISAC): AI algorithms enabling joint communication and sensing (e.g., radar, localization, context awareness) within the same network infrastructure• Intelligent Non-Terrestrial Networks (NTN): AI/ML for dynamic resource allocation, mobility management, and optimization across converged satellite and cellular networks• Advances in AI/ML for signal processing: novel deep learning and statistical methods for enhanced signal processing in future heterogeneous networks
Trustworthiness, security, and sustainability	<ul style="list-style-type: none">• Trustworthiness and responsibility of AI/ML: methodologies for explainable AI (XAI) and interpretable ML (IML) to ensure fairness, accountability, and reliability of models used in critical network functions• Privacy-preserving AI: secure and effective deployment of federated learning (FL) and other privacy-enhancing technologies (PETs) for distributed data analytics in resource-constrained environments• AI for network security: ML solutions for intrusion and vulnerability detection (e.g., in SDN/NFV), automated threat response, and resilient network defence), quantum resistant security, AI-native trust frameworks and automated identity management• AI for energy-efficient operations: AI for modelling, optimization, and real-time control to reduce energy consumption and improve the environmental impact of 6G and future network infrastructures
Enabling technologies and standardization	<ul style="list-style-type: none">• Application of AI/ML in resource constrained environments and other domains• AI/ML for the verification of software and hardware in future networks• AI/ML in support of standard comprehension, creation, and use in future networks

Keywords

6G, AI-native networks, generative AI (GenAI), digital twin, integrated sensing and communication (ISAC), machine learning (ML), beyond 5G

Deadlines extended

Paper submission: **30 August 2026**

Paper acceptance notification: 30 October 2026

Camera-ready paper submission: 15 December 2026

Paper submission

This special issue calls for original scientific papers.

Submitted papers should not be under consideration for publication elsewhere.

Submissions must be made electronically using

[ScholarOne Manuscripts](#), where templates and guidelines are also available.

Publication

Papers will be published in the [ITU digital library](#).

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