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Future and evolving technologies

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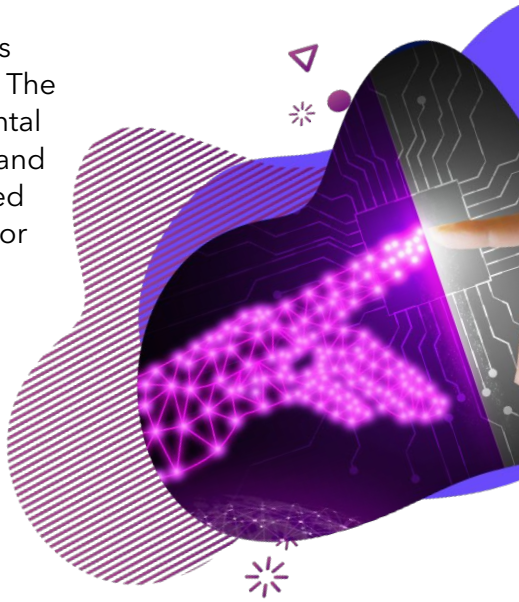
The *ITU Journal on Future and Evolving Technologies (ITU J-FET)* is an international journal providing complete coverage of all communications and networking paradigms, free of charge for both readers and authors. The ITU Journal considers yet-to-be-published papers addressing fundamental and applied 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.



Special issue on

Digital Twins

Call for papers

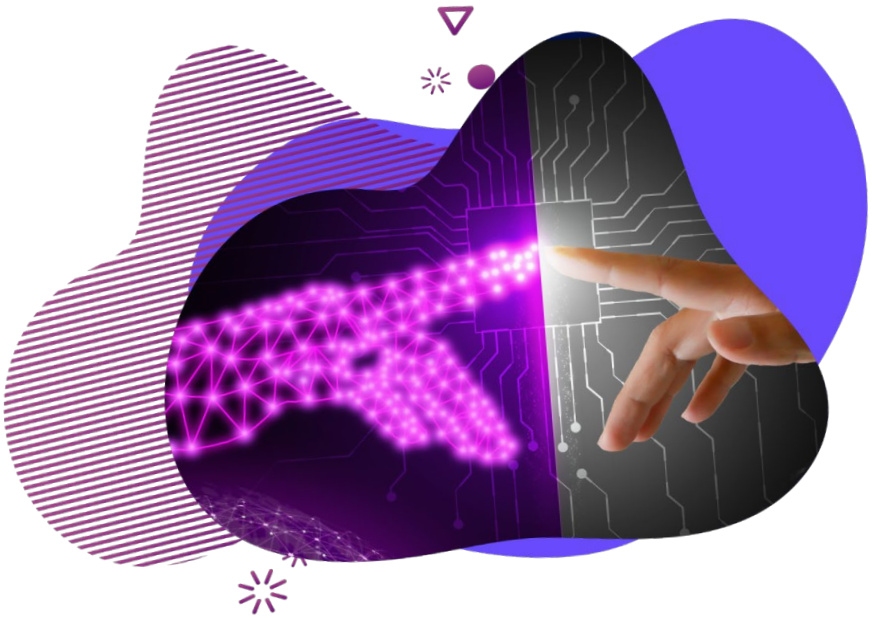
Digital twins are becoming a key concept for communication and networked systems. A digital twin keeps a live digital copy of a physical asset, process or network and uses it for monitoring, diagnosis, prediction, optimization and closed-loop control. Today, digital twins are studied for wireless and sixth-generation (6G) networks, Industrial Internet of Things (IIoT) systems, edge–cloud infrastructures and larger settings, such as Digital Twin Networks (DTNs), Digital Twin Edge networks (DITENs) and the Internet of Digital Twins (IoDTs).

Recent research and survey studies show that several core problems are still open. Digital twins must handle heterogeneous, high-rate data streams from sensors, logs, simulations and external sources, and support both batch and streaming analytics. Their models need to be accurate but efficient, combining physics-based models with data-driven and hybrid approaches, often using Artificial Intelligence (AI) and Machine Learning (ML). Twins must stay synchronized with their physical counterparts under strict latency and reliability targets, while computation and communication are coordinated across edge, fog and cloud resources. As deployments grow, security, privacy, trust and governance become central, together with clear metrics such as twinning rate, age-of-twin, fidelity, decision accuracy, latency, overhead and recovery time.

This special issue, on Digital Twins, invites contributions that address these challenges for communication and networked systems. We welcome original research papers, surveys and position papers on foundations and architectures for digital twins, as well as data, communication and computing platforms that support them. Also welcome are AI and learning-based modelling and decision-making, and security, privacy, trust and resilience for twin systems. We especially encourage work that defines and uses explicit metrics, and those that build or evaluate experimental platforms, testbeds, simulators or real deployments. Interdisciplinary submissions are also welcome; for example, linking communication networks with industrial systems, transportation, smart cities, energy, healthcare and other critical infrastructures, or studying the impact of digital twins on standardization, regulation and policy.

Suggested topics (but not limited to):

Architecture and platforms for digital twins	• Architectures for digital twins in communication and networked systems • Digital twins for wireless, fifth-generations (5G) and sixth-generation (6G) networks • Digital Twin Networks (DTNs) and Digital Twin Edge Networks (DITENs) • Internet of Digital Twin (IoDT) frameworks and intra-twin / inter-twin communication • Data, model and service components in digital twin platforms • Twin lifecycle management and orchestration across edge-cloud infrastructures
Data, modelling and learning for digital twins	• Data acquisition, preprocessing and fusion for digital twins • Streaming pipelines and real-time analytics for twin updates • Physics-based, data-driven and hybrid models for digital twins • Artificial Intelligence (AI) and Machine Learning (ML) for twin behaviour, prediction and control • What-if analysis, scenario generation and decision support with digital twins • Performance and reliability metrics (e.g. twinning rate, age-of-twin, fidelity, decision accuracy, latency, overhead)
Security, privacy and trust in digital twin systems	• Threat models and attack taxonomies for digital twins, DTN, DITEN and IoDT • Secure communication and access control for digital twin interfaces and Application Programming Interfaces (APIs) • Privacy-preserving data collection, storage and analytics in twin platforms • Trust, identity and binding between physical assets and their digital twins • Resilience, anomaly detection and intrusion detection in twin-driven control loops • Governance and risk management for large scale-digital twin deployments
Applications, testbeds and standards for digital twins	• Digital twin applications in industrial Internet of Things (IIoT), smart manufacturing, energy, transportation and smart cities • Digital twins for radio access networks, core networks and end-to-end service management • Experimental platforms, testbeds and simulators for digital twins in communication and networked systems • Deployment experiences, case studies and lessons learned from real-world digital twin systems • Standardization activities and reference models for digital twins, DTN, DITEN and IoDT



Keywords
5G, 6G, artificial intelligence (AI), cloud computing, data fusion, digital twin, digital twin edge network (DITEN),digital twin network (DTN), edge computing, industrial Internet of things (IIoT), Internet of digital twins (IoDTs), machine learning (ML), network management, performance metrics, privacy, resilience, security, standardization, testbeds, trust

Deadlines extended
Paper submission: 30 March 2026
Paper acceptance notification: 1 June 2026
Camera-ready paper submission: 1 July 2026

Submission guidelines
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 (manuscriptcentral.com). Templates and guidelines can be found at: https://www.itu.int/en/journal/j-fet/Pages/submission-guidelines.aspx.

Publication
Papers will be published in the ITU digital library.

Additional information
For additional information, please visit the ITU J-FET website at https://www.itu.int/en/journal/j-fet/Pages/default.aspx. Inquiries should be addressed to Alessia Magliarditi at journal@itu.int.