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PUBLICATIONS

Digital Twins for Mobile Networks

Publication Date

Fourth Quarter 2023

Manuscript Submission Deadline

1 November 2022

Special Issue

Call for Papers

Digital Twins (DTs) are a new approach to testing and assurance for mobile networks by providing an emulated software replica of the mobile network that enables continuous prototyping, testing, and optimization. Due to the scale and

complexity of mobile networks, as well as the high impact of their downtime and failures, DT for Mobile Networks (DTMN) can add significant value to the development and operational phases of mobile networks. They can help mobile network providers predict and assess network incidents, perform testing, provide network updates, etc. DTs can also facilitate the implementation of more powerful features and services, including the embedding of artificial intelligence (AI) in mobile networks. DTs can be used to develop AI algorithms when real networks cannot provide enough real data or when it is unsafe to apply AI algorithms to real networks. In addition, with the ongoing developments of 5G and 6G, mobile networks will be denser, will need to react quickly, and small changes in the network can have a cascading effect in a short period of time. Effective DT implementation can contribute to the success of mobile networks in 6G or even beyond, giving mobile network operators the opportunity to simulate different scenarios, test solutions, facilitate network analysis and find optimal mobile network operations.

While DTs can bring significant benefits to mobile networks, there are still issues and challenges to be addressed, including data collection and storage, data modeling, network visualization, interface standardization, as well as addressing security and forensics, energy efficiency planning, and hardware. In this timely Special Issue, we aim to bring together contributions that focus on DTs for addressing the above-mentioned challenges. Topics covered include, but are not limited to:

- New paradigm for DTMNs
- Architecture and standard for DTMNs
- DTMN application areas, including manufacturing, healthcare, smart cities, finance, and education
- Robots, drones, and autonomous vehicles in DTs for mobile networks
- AI, sensors, clouds, and edge computing enabled DTMN
- Intelligent DTs-based software-defined vehicular networks
- DTs for fault detection in Terrestrial Networks/ Non-Terrestrial Networks
- DTMNs for cloud-based frameworks in e-health systems
- Standardized interfaces and protocol for DTMNs
- Federated learning in DTMNs

- Edge intelligence as a service for real-time control in DTMNs
- Data security and traceability supported by distributed ledgers for DTMNs
- DT-based efficient resource allocation in 5G/6G
- Digital twins for system of systems
- Cognitive aspects of DTMN
- Societal and ethical aspects of DTMN
- Visualization and mobility management in DTMNs.

Submission Guidelines

Prospective authors should submit their manuscripts following the *IEEE JSAC* guidelines. Authors should submit a PDF version of their complete manuscript to EDAS according to the following schedule:

Important Dates

Manuscript Submission Deadline: 1 November 2022
First Notification: 1 March 2023
Acceptance Notification: 15 May 2023
Final Manuscript Submission: 1 June 2023
Publication Date: Fourth Quarter 2023

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