

IEEE INTERNET OF THINGS JOURNAL Special Issue

Call for Papers

NEXT GENERATION MULTIPLE ACCESS FOR INTERNET-OF-THINGS

In next-generation Internet-of-Thing (IoT) networks, challenging heterogeneous services and applications, such as Industry 4.0, require the provisioning of unprecedented massive device access, heterogeneous data traffic, high spectral efficiency, and low latency. The aforementioned applications and requirements cannot be fully accommodated by conventional orthogonal multiple access (OMA), which relies on different orthogonal resource blocks (RBs) and hence leads to spectral and energy inefficiency for serving massive IoT devices. Therefore, to satisfy these stringent requirements, novel next generation multiple access (NGMA) techniques are urgently needed to realize the key performance indicators for the design of the IoT networks. In principle, NGMA is expected to remove the orthogonality of RBs and ensure that all possible RBs can be utilized in the most effective and flexible manner to serve massive machine-type communications, such as time slots, frequency bands, spreading codes, and power levels. However, integrating NGMA and IoT networks, and achieving its full potential is challenging, as it introduces many specific constraints. For example, the strong synergy between advanced machine learning and NGMA for IoT networks is expected, but the complex massive device nature makes a joint design of NGMA and IoT networks challenging.

This special issue invites novel contributions from researchers and practitioners, and seeks to advance the NGMA for IoT to accelerate research, innovations, and applications. We solicit high-quality original research papers on topics including, but not limited to:

- Fundamental limits and performance analysis of NGMA for IoT
- X-domain NGMA for next-generation IoT
- Cross synergies between AI and NGMA for IoT
- Integration of reconfigurable intelligent surface (RIS)/simultaneously transmitting and reflecting (STAR)-RIS and NGMA for IoT NGMA aided underwater, terrestrial, aerial, and satellite IoT scenarios
- NGMA-enabled semantic/sensing/positioning/task/goal-oriented IoT
- NGMA-aided ultra-reliable low-latency communication (URLLC) for IoT
- NGMA-aided machine type communications for IoT
- NGMA enhanced IoT scenarios, e.g., THz and mmWave communications, multiple-antenna-aided communications, near-field communications (NFC), and high mobility communications
- NGMA-aided advanced massive/random/grant-free access for IoT
- NGMA-aided multi-functional networks for IoT, e.g., integrated sensing and communication (ISAC) and integrated navigation and communication (INAC) for IoT
- NGMA-aided spectral efficient and energy efficient IoT networks

Prospective authors should submit their manuscripts following the IEEE IoT-J guidelines. Authors should submit a PDF version of their complete manuscript to Manuscript Central according to the following schedule:

Manuscript submission:	March 1st, 2024	First review completed:	May 1st, 2024
Revised manuscript due:	June 1st, 2024	Second review completed:	July 1st, 2024
Final manuscript submission:	July 15th, 2024	Publication date:	August, 2024

Guest Editors:

Name	Institute	email
Prof. Tianwei Hou (Lead)	Beijing Jiaotong University and Friedrich-Alexander Universitat Erlangen-Nurnberg (FAU)	twhou@bjtu.edu.cn
Dr. Xidong Mu	Queen Mary University of London	xidong.mu@qmul.ac.uk
Prof. Zhiguo Ding	The University of Manchester	zhiguo.ding@manchester.ac.uk
Prof. Octavia A. Dobre	Memorial University	odobre@mun.ca
Prof. Naofal Al-Dhahir	University of Texas at Dallas	aldhahir@utdallas.edu