

IEEE INTERNET OF THINGS JOURNAL Special Issue on

6G Near-Field Technologies for The Internet of Things

Nowadays, many disruptive Internet-of-Things (IoT) applications such as the metaverse, augmented/virtual reality, and autonomous driving, have been emerging. These new services impose severe requirements on data rates, ultra-massive access capabilities, energy efficiency, etc. To fulfill these challenging requirements, extremely large-scale antenna arrays (ELAA) have been viewed as an essential physical-layer technology for 6G systems. By deploying hundreds, or even thousands, of antenna elements at base stations or at reconfigurable intelligent surfaces (RISs), ELAA shows immense potential in enhancing system performance.

Notably, the envisioned deployment of ELAA in future 6G networks, especially in high-frequency bands, introduces an intriguing shift from the far-field region assumed by conventional wireless systems to the radiating near-field or Fresnel region. Unlike the far-field case, where plane wave propagation holds, the radiating near-field region exhibits curved wavefronts, offering additional information and degrees-of-freedom that can be leveraged to significantly enhance communications, localization, and other related services. Taking wireless power transfer as an example, energy transfer efficiency can be significantly enhanced with reduced energy pollution using near-field beam-focusing, making it an appealing technique for wirelessly charging massive low-power devices in future IoT scenarios.

This special issue invites novel contributions from researchers and practitioners and seeks to advance near-field technologies 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 near-field technologies
- Near-field NOMA/RSMA/grant-free access
- Near-field localization/sensing/tracking/imaging
- Near-field integrated sensing and communications
- Holographic MIMO/RIS-enabled near-field techniques
- Near-field wireless power transfer/ simultaneous wireless information and power transfer
- Near-field physical-layer security
- Machine learning aided near-field technologies

Submission Guidelines:

All original manuscripts or revisions to the IEEE IoT Journal must be submitted electronically through IEEE Manuscript Central, <http://mc.manuscriptcentral.com/iot>. When the authors reach the “Article Type” step in the submission process, they should select “SI: 6G Near-Field Technologies for The Internet of Things.” Solicited original submissions must not be currently under consideration for publication in other venues. Author guidelines and submission information can be found at <http://iee-iotj.org/guidelines-for-authors/>

Important Dates:

Manuscript submission:	November 30th, 2024	First review completed:	January 30th, 2025
Revised manuscript due:	February 30th, 2025	Second review completed:	March 30th, 2025
Final manuscript submission:	April 30th, 2025	Publication date:	June 2025

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