

CALL FOR PAPERS
IEEE Internet of Things Journal Special Issue on
Integrated Sensing, Computing and Communication for Internet of Robotic Things

Internet of Robotic Things (IoRT) is an emerging IoT paradigm that uses robots to collect, transmit and analyse data. It involves a variety of robots that operate in space, air, ground, and water, making them particularly useful in extreme environments where human presence is difficult. Despite this, there are still barriers that prevent IoRT from reaching a broader audience. For example, blockages could prevent sensors from detecting obstacles; limited on-board CPU resources could hamper AI models; and the harsh nature of propagation mediums (fading, absorption, scattering) could hinder transmissions; to name just a few.

These challenges could be tackled by integrated sensing, computing and communication (ISCC), a breakthrough technology in 6G. With ISCC, wireless signals can be converted into new “sensors” that help detect obstacles; on-board computing tasks can be offloaded to the edge/cloud; position and velocity of robots can be utilized to optimize beam tracking. However, new challenges also arise when deploying ISCC. Voicing an example, a robot's battery may rapidly drain when continuously sensing and communicating.

The purpose of this special issue is to bring together academic and industrial experts to discuss and share new IoRT applications enabled by ISCC. This includes next-generation sensing, computing and communication solutions across the robot-edge-cloud continuum. It is expected that original research will push the physical limit of robots and provide them with the ability to adapt to environments reliably, agilely and energy efficiently.

Topics of interest include, but are not limited to:

- Use case studies of ISCC for IoRT.
- Learning for distributed and collaborative ISCC for IoRT.
- New sensing, computing and communication theories for IoRT.
- Networking architectures and protocol stack of ISCC for IoRT.
- 6G-enabled ISCC for IoRT.
- Modulation and beamforming design of ISCC for IoRT.
- Spectrum analysis and management of ISCC for IoRT.
- Cloud and edge computing intelligence of ISCC for IoRT.
- Machine learning and AI enabled ISCC for IoRT.
- Cybersecurity and privacy of ISCC for IoRT.
- Performance analysis and experimental testbeds of ISCC for IoRT.

Important Dates:

Submission Deadline: April 15th, 2024

First Review Due: June 15th, 2024

Revision Due: July 15th, 2024

Sec. Review Due/Notification: August 15th, 2024

Final Manuscript Due: August 31st, 2024

Publication Date: September 2024

Submission

All original manuscripts or revisions to the IEEE IoT Journal must be submitted electronically through IEEE Manuscript Central, <http://mc.manuscriptcentral.com/iot>. Solicited original submissions must not be currently under consideration for publication in other venues. Author guidelines and submission information can be found at <http://iot.ieee.org/journal>.

Guest Editors:

- Zhenhui Yuan, Northumbria University, UK, email: zhenhui.yuan@northumbria.ac.uk
- Qing Li, Peng Cheng Laboratory, China, email: liq@pcl.ac.cn
- Fabrizio Granelli, University of Trento, Italy, email: fabrizio.granelli@unitn.it
- Arumugam Nallanathan, Queen Mary University of London, UK, email: a.nallanathan@qmul.ac.uk
- Hongyi “Michael” Wu, University of Arizona, USA, email: mhwu@arizona.edu