Foundation Models and Generative AI for Intelligent Wireless Sensing and Multitask Signal Recognition in Complex Electromagnetic Environments

2026 7th Information Communication Technologies Conference (ICTC) will be held in Nanjing, China during May 8-10, 2026. ICTC 2026 is sponsored by **Southeast University**, supported by **Jiangsu Information Technology Application Society**, and **Alliance of Key Laboratories for Telecommunication Technology(AKL-TT)**. At the event, participants will have the opportunity to share their research results in the field of ICT, discuss future technology trends, and how to deal with security challenges related to digitalization. In addition, this conference will further explore how to promote continuous progress in the ICT field, thereby laying a solid foundation for digital development. You are welcome to attend ICTC!

Topics in Special Session 7

Wireless systems are increasingly deployed in complex, dynamic, and interference-rich electromagnetic environments, where conventional model-driven sensing and recognition techniques face severe challenges in robustness, generalization, and scalability. Meanwhile, recent advances in foundation models and generative AI have opened new opportunities for learning universal representations, modeling signal distributions, and enabling multitask intelligence across heterogeneous wireless scenarios.
This special session aims to explore intelligent wireless sensing and multitask signal recognition empowered by foundation models and generative AI, with particular emphasis on complex electromagnetic environments. The session will bring together researchers from academia and industry to present cutting-edge theories, algorithms, and applications that leverage large-scale pre-training, generative modeling, and cross-task learning to advance wireless sensing and recognition performance.

Related Topics:

- Automatic Modulation Classification (AMC) in complex electromagnetic environments
- Specific Emitter Identification (SEI) and RF fingerprinting for wireless devices and unmanned platforms
- Interference recognition and classification, including jamming, spoofing, and co-channel interference
- Wireless technology and protocol recognition (e.g., WiFi, LTE/5G/6G, UAV links, IoT standards)
- Multitask signal recognition frameworks for joint modulation, emitter, interference, and technology identification
- Foundation models and large-scale pre-trained models for wireless signal representation and multitask learning
- Generative AI for signal recognition, including diffusion models and GANs for data augmentation and distribution modeling
- Robust signal recognition under non-IID, low-SNR, and adversarial conditions
- UAV and unmanned system identification via RF fingerprinting and communication signal analysis
- Wireless sensing and recognition for UAV swarms and low-altitude platforms
- Indoor wireless sensing, including human activity and pose estimation using RF signals
- Cross-domain generalization, few-shot, and zero-shot signal recognition
- AI-enabled spectrum sensing and cognitive radio for signal identification
- Integrated sensing and communications (ISAC) for joint recognition and perception tasks

Submission Link: https://www.zmeeting.org/submission/ictc2026 (**Choose Special Session 7 to Submit**)
More details about Special session 7: https://www.ictc.net/special_7.html

Chair

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Assoc. Prof. Qianyun Zhang
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Dr. Xixi Zhang
Hohai University, China
Invited Speaker

Publications

Submitted manuscripts will be peer reviewed by the conference scientific committees. Accepted papers will be included into Conference Proceedings, and submitted for indexing by **Ei Compendex** and **Scopus**. The authors of the papers will be invited to participate in ICTC 2026 to display their research works.

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