

5th IEEE SYMPOSIUM ON JOINT COMMUNICATION & SENSING

January 28 – 30, 2025
jcms-symposium.org

Call for Papers and Demo Papers

The wireless community is currently exploring new technologies for 6G and beyond. Key pillars will very likely include integrated artificial intelligence (AI) and communications, ubiquitous connectivity, as well as integrated sensing and communications (ISAC). Hence, the integration of sensing functionality is emerging as a key feature of the 6G Radio Access Network (RAN), allowing to exploit the dense cell infrastructure for constructing a joint communication and sensing (JC&S) network wherein the two functionalities are jointly optimized and co-designed.

As such, the future outdoor and indoor networks could image and measure the surrounding environment to enable advanced environment and location-aware services, ranging from PHY to application layers. While positioning is already implemented in 4G and 5G standards, it is anticipated that ISAC and more particularly JC&S will be at the heart of 6G and beyond systems. Indoor systems are following the same trend, the upcoming IEEE 802.11bf Wi-Fi sensing standard being a first step in this direction.

Apart from the cellular network and Wi-Fi applications, the need for optimization of energy and other resources, interference reduction will require several verticals to utilize JC&S/ISAC aligned with existing standards and upcoming standards. New developments are expected to increase communications and sensing performance as well, relying, among others, on wider bandwidths, more antennas, and higher carrier frequencies. Advances in theoretical understanding of the performance and limitations, new algorithmic solutions, including those based on machine learning, and novel hardware solution are needed to make that vision come true.

Despite having drawn huge attention from both academia and industry, many open problems remain to be investigated in JC&S. This symposium aims at bringing together researchers from academia and industry to identify and discuss major technical challenges, recent breakthroughs, and novel applications related to JC&S looking towards 6G deployments.

Information at one glance

Paper Submission Deadline:
Friday September 13th, 2024

Conference Date:
January 28 – 30, 2025

Conference Location:
Oulu, Finland

Stay up to date:
<https://jcms-symposium.org/>

Link to JC&S 2025 on EDAS
(will be updated once available)

Topics include but are not limited to:

- Fundamental information theoretical limits for JC&S
- Network architecture / transmission protocols / frame designs for JC&S
- Innovative hardware designs addressing power consumption, size, and cost benefits for JC&S
- RF front-end and antenna design for JC&S
- Spectrum analysis and management of JC&S
- Full duplex / interference management techniques of JC&S
- Precoding / waveform / modulation / receiver design for JC&S
- Security and privacy issues for JC&S
- Machine learning / Network Intelligence for JC&S
- AI-assisted JC&S
- MIMO / Massive MIMO / intelligent reflecting surfaces (IRS) for JC&S
- Fine range, Doppler and angle estimation in wireless networks
- SLAM in wireless networks
- Millimeter wave / THz technologies for JC&S
- JC&S for highly mobile networks
- Chirp-based communication and sensing
- Hardware reuse and sharing for JC&S
- Standardization of JC&S
- Wi-Fi sensing / positioning / detection for JC&S

Papers outside the areas listed above, but related to the focus of the symposium, are also welcome. Manuscripts not exceeding 6 pages must be submitted through EDAS. Extended abstracts from 2 to 3 pages can also be submitted. Submissions should be formatted according to the IEEE conference template. Manuscripts will be peer-reviewed according to the standard IEEE process. All accepted (and presented) papers will be published in the symposium proceedings and will be submitted for inclusion into IEEE Xplore subject to meeting IEEE Xplore's scope and quality requirements.

The authors are encouraged to indicate their preference among the 3 options during the submission – oral presentation, poster presentation and Demo paper. All of them will be included in the IEEE Xplore subject to the same conditions.

Demo paper submission:

Physical demo in Finland will be a necessary requirement if the paper is accepted.

Technical demonstrations showing/presenting innovative and original research are solicited. In general, IEEE JC&S is interested in demonstrations and posters of technology that validate important research ideas or showcase realistic applications. The demo research topics of interest include but are not limited to list shown above.

Demo paper submission instructions:

Submissions should be a two-page abstract that follows the IEEE formatting guidelines. Please refer to the IEEE submission instructions for details. There is no need for double-blind submissions (names, affiliations, and email addresses are therefore required). Please be as specific as possible in describing what you will display or demonstrate for your demo. The demo session will be held in person, and at least one co-author of the accepted demo is required to present in the conference. If a demonstration requires special arrangements or additional equipment, please detail it in the submission. All additional equipment/needs are subject to budget approval. Abstracts of accepted demos will be included in the JC&S 2025 Proceedings. Accepted and presented abstracts will be submitted to IEEE Xplore®.