



## Call for Papers

Paper Submission Deadline: October 23, 2023

EDAS Submission: <https://edas.info/N31610>

Website: <https://jcns-symposium.org/>

As the standardization of 5G-Advanced progresses, researchers are speculating what 6G will be. The anticipated key novelties of 6G 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 both sensing and communication. 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. Beyond integration of sensing functionalities, there are opportunities for constructing a joint communication and sensing (JC&S) network wherein the two functionalities are jointly optimized and co-designed. This JC&S requires a possible redesign of waveforms, system architectures, spectrum use methods or hardware implementations. While positioning is already integrated 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, driving the most innovative joint redesign of our future sensing and communication infrastructure and technology. Indoor systems are following the same trend, the upcoming IEEE 802.11bf Wi-Fi sensing standard being a first step in this direction. New developments are expected to increase communications and sensing performance, relying, among others, on wider bandwidths, more antennas, and higher carrier frequencies. Advances in theoretical understanding of the performance and limitations, and new algorithmic solutions, including those based on machine learning, 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 when integrating sensing and communication (ISAC) or jointly designing them in JC&S. This symposium aims at bringing together researchers from academia and industry to identify and discuss major technical challenges, recent breakthroughs, hardware aspects and novel applications related to JC&S. Papers focusing on the integration on sensing and communication (ISAC) and not necessarily their joint design (JC&S) are also welcome. 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 system 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 (RIS) 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
- Experiments, demonstrations and prototypes
- JC&S for acoustic/optical and powerline signals

Papers outside the areas listed above, but related to the focus of the symposium (ISAC or JC&S), 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.

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**Deadlines:**

Paper Submission Deadline: October 23, 2023

Acceptance Notification: December 2023

Final Paper Due: January 31, 2024

Video Submission: February 29, 2024 (for remote presentations only)

**You can find more details about the conference and the paper submission process on:**

<https://jcns-symposium.org/>

We would be delighted if you submit a paper and join us at this exciting event!

With best regards,

**Gerhard P. Fettweis**  
General Co-Chair

**Fan Liu**  
Technical Program Co-Chair

**André Bourdoux**  
General Co-Chair

**Sofie Pollin**  
Technical Program Co-Chair

**Markku Juntti**  
Technical Program Co-Chair