

Special Session on “Trustworthiness in Joint Sensing and Communication: Technical, Human and Legal Dimensions for 6G”

Special Session co-Chairs:

Roya Khanzadeh, Johannes Kepler University Linz, Institute for Communications Engineering and RF-Systems and JKU LIT SAL IWS Lab, Linz, Austria

Katrien De Moor, Norwegian University of Science and Technology, Department of Information Security and Communication Technology, Trondheim, Norway

Iraklis Symeonidis, Division Digital Systems, Department Industrial Systems, Unit Smart Automation and Cyber Resilience

Basak Ozan Ozparlak, Ozyegin University, Faculty of Law, Istanbul, Turkiye

Brief description

Joint sensing and communication (JSAC) is an emerging technology that enables novel applications and capabilities in the 6th generation of wireless communication, including intelligent traffic management, precise localization and tracking, immersive extended reality and digital twins, enhanced environmental perception, advanced human-machine interaction, etc. However, the integration of sensing and communication simultaneously expands the attack surface and introduces new vulnerabilities related to sensing manipulation, context spoofing, privacy leakage, and reliability issues. Ensuring trustworthiness in such systems therefore requires moving beyond conventional security notions toward an integrated view that accounts not only for technical methodologies, but also robust ways to capture human aspects (e.g., human perception, trust, behavior) and regulatory constraints.

This Special Session focuses on the design, modeling, and evaluation of trustworthy JSAC-enabled 6G systems, aligned with the paradigm of responsible-by-design wireless systems, and though stimulating the meaningful integration of technical, social, and legal dimensions. By integrating 6G JSAC system design with human-centric measures and performance metrics, and regulatory admissibility constraints, this Special Session offers a timely and technically grounded platform aligned with the central research challenges of the ICT community. The session also aims to provide a technically rigorous platform to discuss how communication and sensing architectures can be engineered to remain trustworthy, robust, adaptive, and legally compliant while preserving user trust and expectation.

Topics of Interest

The Special Session invites original contributions including, but not limited to:

- Physical-layer security, privacy, or trust mechanisms in JSAC
- Secure and resilient JSAC architectures for 6G
- Cyber resilience and threat modelling for JSAC
- Adversarial manipulation of sensing and localization
- Trustworthiness metrics for JSAC
- Methods and foundation for trustworthiness evaluation in JSAC
- Methods and foundation for trustworthiness management in JSAC

- AI/ML-driven trustworthiness evaluation and enhancement in JSAC
- Joint technical-social-legal resilience-by-design foundations in JSAC
- Trustworthiness in emerging cyber-physical 6G sensing-enabled applications
- Privacy-preserving sensing and regulatory-aware wireless design
- Legal and accountability challenges in sensing-enabled 6G systems
- Human-centric performance metrics in communication and sensing
- Critical discussions on or demonstrations of relevant human-centric measures, methodologies and case studies
- Trade-offs between sensing, security, latency, and privacy

Support

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