SUNDAY 13:50 – 17:50

AI and Data-Driven Modeling for RF/MW Design

WS12
EuMC/
EuMIC

Chair: Tom Dhaene[1]
Co-Chair: Domenico Spina[2]
[1]Ghent University, [2]Vrije Universiteit Brussel

Room: Juliana 4

Joint Communications and Radio Sensing (JCAS), also referred to as Integrated Sensing and Communications (ISAC), has been a key focus of several 6G projects, discussions, and standardization platforms worldwide in recent years. It has been extensively explored as a critical part of next-generation communication systems beyond cellular networks. To expand the utilization of JCAS, a system-level co-design approach will serve as a key enabler, with RF hardware (frontend and antenna system) playing a pivotal role.

This workshop aims to cover the state-of-the-art advancements and emerging enabling technologies, with a specific focus on antenna systems, beamforming and array processing techniques, reconfigurable frontends, signal processing, privacy-preserving mechanisms and related demonstration platforms to identify the remaining gaps between ideas and actual deployments in real-world scenarios (aiming 2030 as the year of 6G deployments).

The workshop will span applications that use frequencies from sub-10 GHz (e.g., FR1, UWB) to sub-THz (e.g., D-band and 256 GHz), with multiple talks highlighting flexible architectures and dual-/wide-band methodologies. Comprising of six talks, the sessions emphasize deployable concepts for the 6G Internet-of-Everything era. They address deployment challenges and solutions across diverse frequency bands, showcasing innovations such as reconfigurable frontends and antennas, repurposing existing systems for new use cases, and promoting energy-efficient operation.

PROGRAMME

Neural Network-based methodologies for the design of modern RF and microwave systems

Domenico Spina[1]
[1]Vrije Universiteit Brussel

Data-efficient Bayesian techniques for microwave design and optimization

Tom Dhaene[1]
[1]Ghent University

Gaussian processes for data-efficient uncertainty quantification of electronic designs

Paolo Manfredi[1]
[1]Politecnico di Torino, Italy

Kernel-Based System Identification of Electronic Devices

Thijs Ullrick[1]
[1]Ghent University, Belgium

Machine Learning-enhanced development of complex antenna structures: topology synthesis, multi-objective optimization and robust design

Adrian Bekasiewicz[1]
[1]Gdansk University of Technology