Workshop on "6G Technologies and Architectures for the Internet of Things (6G-for-IoT)"

Workshop co-Chairs:

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Description

The evolution from 5G to 6G mobile systems is expected to enable a new generation of Internet of Things (IoT) services characterized by global connectivity, energy efficiency, resilience, and intelligence. However, current IoT deployments remain constrained by fragmented connectivity models, limited energy efficiency, and insufficient support for operation in challenging environments such as industrial sites, underground infrastructures, underwater environments, and remote areas. Addressing these challenges requires a rethinking of IoT architectures across devices, radio access networks, and core networks, with a strong focus on AI-native operation, integrated sensing and communication, and seamless integration of terrestrial and non-terrestrial networks.

The 6G-for-IoT workshop aims to bring together researchers and practitioners from academia, industry, and research projects to discuss emerging solutions for next-generation IoT systems in the context of 6G networks. The workshop will focus on novel architectures, protocols, and technologies that enable intelligent, energy-efficient, resilient, and secure IoT services, including AI-driven device operation, integrated sensing and communication, multi-connectivity solutions, and autonomous network orchestration. A particular emphasis will be placed on IoT deployments in challenging and large-scale environments, as well as on cross-domain solutions spanning devices, radio access networks, and core network architectures. The workshop will also explore the role of AI and machine learning in enabling adaptive and autonomous IoT systems, as well as new approaches for secure and trustworthy IoT connectivity.

The workshop is expected to attract participants working on 6G architectures, IoT systems, AI-native networks, and emerging communication technologies. It will provide a forum for presenting early research results, discussing ongoing research challenges, and fostering collaboration between academic and industrial stakeholders working on next-generation IoT systems.

Topics of interest include, but are not limited to:

- 6G architectures for IoT systems
- AI-native IoT devices and networks
- Energy-efficient IoT communications
- Edge AI and on-device intelligence for IoT
- Integrated sensing and communication (ISAC)
- IoT positioning and localization techniques
- Terrestrial and non-terrestrial network integration for IoT
- Resilient IoT connectivity and multi-connectivity solutions

- IoT network orchestration and automation
- IoT security and trust architectures
- Zero-trust architectures for IoT
- Federated and distributed IoT architectures
- IoT in challenging environments (industrial, underground, underwater)
- Sustainable IoT and green communications
- Experimental platforms and IoT testbeds
- IoT use cases and real-world deployments
- Analysis and validation of key performance/value indicators for IoT verticals
- Standardization and interoperability for IoT and 6G

Relevance to ICT 2026

The workshop aligns closely with the themes of ICT 2026, particularly in the areas of 6G systems, AI-driven networks, and next-generation communication architectures. The focus on IoT as a key vertical for 6G evolution makes this workshop particularly relevant to the conference audience, as IoT is expected to be a major driver of future communication systems. The workshop will complement the main conference by providing a dedicated forum for IoT-related research in 6G systems, fostering discussion on emerging challenges and opportunities in this rapidly evolving field. It will also encourage collaboration between academic researchers, industry practitioners, and European research initiatives working on next-generation IoT technologies.

Technical Program Committee (TPC)

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PIONEERS-6G – Platform and Device Innovations for Energy-Efficient, Resilient, and Secure 6G IoT Systems, funded under the SNS JU programme (expected starting date: May 2026). PIONEERS-6G aims to design and validate innovative solutions for next-generation IoT systems across device, radio access network, and core network domains. The project develops an IoT-first platform supporting energy-efficient, resilient, and secure IoT services through AI-native architectures, integrated sensing and

communication, and seamless integration of terrestrial and non-terrestrial networks. The workshop will serve as a dissemination and community-building activity for the project, fostering collaboration with the broader 6G and IoT research community and promoting discussion on emerging challenges and solutions for next-generation IoT systems.

6G-PATH – 6G Pilots and Trials Through Europe, funded under the SNS JU programme (started in 2024, https://6gpath.eu). 6G-PATH aims to foster the development and integration of tools and products from EU companies with 5G/6G systems, while also measuring relevant Key Performance Indicators (KPIs) and Key Value Indicators (KVIs). To achieve this, 7 testbeds are included in the project and used by 10 use cases spread across four key areas: Health, Education, Smart Cities, and Agriculture.