

Press Release

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European 6G-SENSES Project: Research for revolutionary technology advancements in preparation for 6G

Initial view on the 6G radio access network architecture defined

Santander, Spain. The eleven 6G-SENSES partners, among them the IHP – Leibniz-Institute for High Performance Microelectronics (IHP), mobile network operators and telecommunication providers, universities and other research institutes, which represent six member states and the UK, reunited at the city of Santander, Spain, to finish the definition of the project's use cases and requirements and the initial view on the 6G radio access network (RAN) architecture.

The 6G-SENSES project, with a budget of about € 3.7 million, is funded by the EU's Smart Networks and Services Joint Undertaking (SNS JU) under the Stream B "Wireless communication technologies and signal processing". The SNS JU funds projects shaping the solid research and innovation roadmap and implementation program by engaging a critical mass of European stakeholders and facilitating international cooperation on various 6G initiatives. The project started on January 1, 2024 and is coordinated by IHP, Germany.

At the moment in which the commercial deployment of 5G networks is at its peak, research is already progressing on what will be the next technological step in mobile communications. To date, there is no consensus on the definition of 6G, although there are certain aspects that seem clear in terms of the most relevant application scenarios, some technological elements and performance parameters. According to Missions & Objectives of SNS JU, the 6G networks will be integrated with the largest possible number of sectors and industries, and the scope will go beyond human-to-human connectivity, encompassing situations in which cooperative communication between humans, machines and objects is enabled.

From a more technological point of view, 6G networks will make use of new spectrum resources, using millimeter and terahertz bands, to increase their capacity and speed. In addition, massive and decentralized clusters of antennas will be used, to improve spectral and energy efficiency, enabling a massive growth in the number of connections. Architecturally, 6G networks will take advantage of virtualization, which means combining hardware and software network resources into a single virtual network. This will promote the deployment of software-based network elements, requiring open interfaces.

The 6G-SENSES project focuses on the integration of radio technologies and novel network architectures, based on the frameworks proposed by the 3rd Generation Partnership Project (3GPP) and the Open Radio Access Network (O-RAN) standardization, including RAN Intelligent Controllers (RICs) to enable advanced sensing functionalities, and their integration with communications.

As the main objective, the 6G-SENSES project plans to propose a novel 6G architecture for the RAN. It will be able to offer Integrated Sensing and Communication (ISAC) services. Furthermore, it will provide an ISAC platform based on diverse Wireless Access Technologies (WATs), which include 5G New Radio technologies, Wi-Fi and mmWave



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technologies. This platform will be assisted by Reconfigurable Intelligent Surfaces (RISs) that incorporate cross-technology sensing to evolve O-RAN RICs.

The project started in January of this year and, on September 4th and 5th, the consortium held its second face-to-face meeting at the University of Cantabria. There, the progress of the project was discussed, it focused on the identification of requirements and the first architecture proposals. The project coordinator gave an introduction of the project and stressed the technical challenges and the ambitious proofs of concept.

Partners

1. IHP – Leibniz Institute for High Performance Microelectronics, DE
2. Institute of Accelerating Systems and Applications (IASA), GR
3. University of Cantabria, ES
4. Accelleran, BE
5. Hellenic Telecommunications Organisation S.A. (OTE Group), GR
6. Sapienza University of Rome, IT
7. Technische Universität Braunschweig, DE
8. BubbleRAN, FR
9. Barkhausen Institut, DE
10. Intel Deutschland GmbH, DE
11. The Nottingham Trent University, UK



6G-SENSES will research the 6G RAN capabilities framed by a novel 6G architecture – Team of the 6G SENSES Project, @University of Cantabria

Further Information:

6G-SENSES: <https://6g-senses.eu>

SNS JU mission: [Missions & Objectives - SNS JU \(europa.eu\)](https://missions-objects-sns.eu)



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About IHP:

The IHP is an institute of the Leibniz Association and conducts research and development of silicon-based systems and ultrahigh frequency circuits and technologies including new materials. It develops innovative solutions for application areas such as wireless and broadband communication, security, medical technology, industry 4.0, automotive industry, and aerospace. The IHP employs approximately 365 people. It operates a pilot line for technological developments and the preparation of high-speed circuits with 0.13/0.25 μm SiGe BiCMOS technologies, located in a 1500 m² DIN EN ISO 14644-1 3 certified clean room.

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