NEWSLETTER #3

CONVERGE-PROJECT.EU

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CONVERGE
view-to-communicate and communicate-to-view

Co-funded by the European Union

Milestones & Highlights

- 2025 EuCNC & 6G Summit
- MWC 2025
- Digital Twin of 6G Labs
- Advances in FR2 Base Stations
- Joint Special Issue on 2 EURASIP Journals
- Advancing Global 6G Standards
- SLICES-RI/CONVERGE Summer School
- Fourth Meeting in Barcelona
- IEEE JC&S Symposium
- Fifth Meeting in Belfast

2025 EuCNC & 6G Summit - Poznan

Experience the power of **immersive technology at the IEEE EuCNC & 6G Summit**, June 3–6 in Poznan, Poland, where the CONVERGE project presents a **XR visualization** powered solution for spatially adaptive radio communication. Through two complementary demos, one Augmented Reality (AR) and one Virtual Reality (VR), visitors will explore the cutting edge of **user-interactive wireless control.**

The AR demo offers an **on-site visualization of dynamic beamforming**. When a user blocks the line-of-sight radio beam, the system automatically reroutes the signal using a Reflective Intelligent Surface (RIS). This rerouting process is visually rendered in real-time through a VR headset, enabling users to observe how invisible radio waves reflect and adapt to physical environments. It illustrates the potential of **RIS-enhanced systems** to maintain reliable connectivity.

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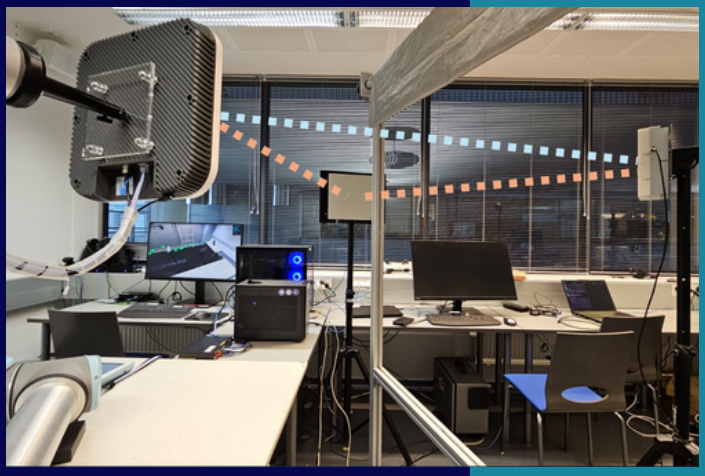
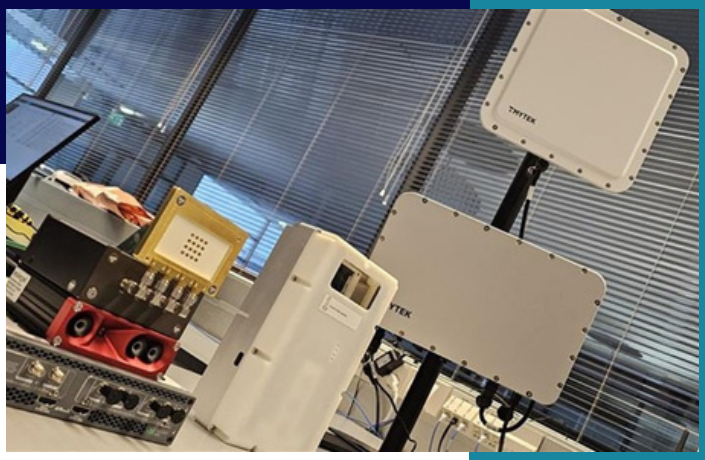




In contrast, the VR demo provides a **remote-control experience.** Users enter a gamified virtual environment where they interact with real-world testbeds located in the University of Oulu (Finland) and INESC TEC (Portugal).

The objective is to maintain **optimal radio transmission by adjusting the beam direction using a VR headset** in a spatial communication scenario. When a blocking structure disrupts the line-of-sight signal, users must redirect the beam toward RIS panel to recover signal quality, demonstrating the **integration of VR interfaces and intelligent radio control**.

Join us at **BOOTH#4a** to explore how CONVERGE is combining on-site AR visualization with remote VR interaction to pioneer intelligent, immersive control in the emerging 6G era.

MWC 2025

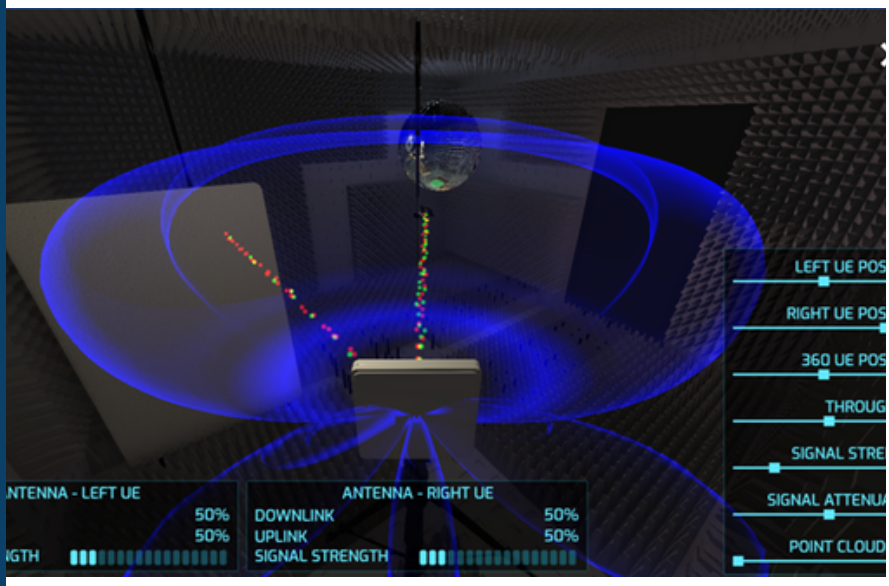
At **Mobile World Congress (MWC) 2025**, Finwe presented an immersive digital twin demo developed in collaboration with University of Oulu, FinCloud, INESC TEC, Allbesmart, and EURECOM, within the framework of the EU-funded CONVERGE project.

This **interactive experience** models the three CONVERGE labs, allowing users to explore the behavior of next-generation radio systems in a visually rich, virtual environment. Designed to be accessed via standard web browsers or XR glasses, the demo offers an immersive way to understand and interact with the core principles behind future 6G communications.

The **digital twins** demonstrate how signals react and adapt in complex, interactive lab setups. They also enable users to **manipulate key parameters such as Reconfigurable Intelligent Surface (RIS)** behavior and observe how these changes affect network throughput. This hands-on interaction supports the CONVERGE project's mission to develop experimental tools that merge radio, vision, and sensing technologies.

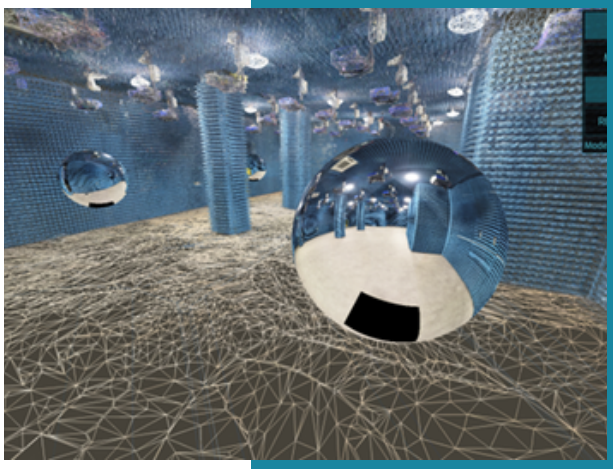
The MWC 2025 demo showcased how **digital twins can accelerate research and experimentation** in advanced wireless systems. The setup attracted attention from industry experts, researchers, and policymakers alike.

Building on the success of this demo, the experience is now being expanded for future events, including an enhanced version for the EuCNC & 6G Summit 2024 in Poznan, Poland.

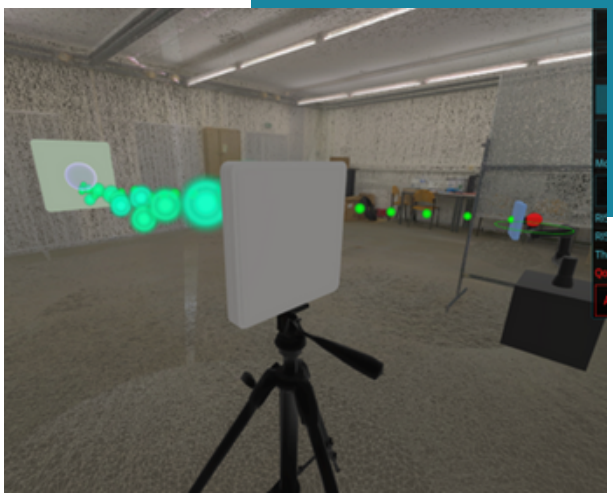


CONVERGE Digital Twin of the Labs

As part of the EU CONVERGE project, a major step has been taken toward creating **immersive test environments for 6G research**. FinCloud captured **key 6G laboratories** across Europe at EURECOM and Inria (Sofia Antipolis), INESC TEC (Porto), and the University of Oulu, using high-precision **360° imaging and 3D point cloud** scanning with millimeter-level accuracy.



Based on this data, Finwe created an **interactive digital twin** that replicates the physical lab spaces. Users can explore the environments via browser or XR headset and conduct virtual measurements, simulate lab setups, and insert components such as 6G radios, RIS units, cameras, and robotic arms.



The digital twin serves as a powerful, accessible testbed for researchers and students, supporting the CONVERGE goal of integrating radio, sensing, and vision technologies to **accelerate 6G development and experimentation.**

CONVERGE Advances in FR2 Base Stations

EURECOM, has driven the development of the Sophia Antipolis node and **5G FR2 base station** under Task 2.2, marking a significant step in delivering high-performance FR2 solutions.

Two cutting-edge platforms delivered: 1) **InterDigital MHU + USRP X410/X320:** a flexible setup with mmWave conversion and analog beamforming; 2) **LiteON O-RU:** a fully integrated, industrial-grade solution. Real-World Testing with COTS Devices: **Quectel RM530F:** Full 5G SA support in FR2; stationary, high-throughput; **2) Galaxy S23/S24:** NR-DC support; requires FR1 gNodeB master, FR2 for user-plane.

Joint Special issue on 2 EURASIP Journals

SpringerOpen is accepting submissions for a joint **special issue of EURASIP Journal on Image and Video Processing and EURASIP Journal on Wireless Communications and Networking on "The Convergence of Computer Vision and Wireless Communications"** exploring AI-enabled sensing, 6G, edge intelligence, and more. Guest editors include experts from CONVERGE. **Deadline: 30 June 2025**

Advancing Global 6G Standards

The CONVERGE consortium is actively shaping future communication technologies through its **contributions to major international standardisation bodies**, including **ETSI ISG RIS, ETSI ISG ISAC, and 3GPP**.

Key milestones include the completion of six Group Reports on Reconfigurable Intelligent Surfaces (RIS), with two more underway for delivery by the end of 2025. A proposal on RIS for 6G was also presented at the 3GPP 6G Workshop in March 2025, receiving support from 13 companies. In ETSI ISG ISAC, 1 Group Report has been finalised, with 4 more in development, focusing on architecture, security, and computing integration.

To date, the project has produced **12 IP submissions and 7 contribution families**, with key inputs from partners including InterDigital and INESC TEC.

Building upon the successful legacy of previous editions in Volos (2022), Oulu (2023), and Lipari (2024), the **SLICES Summer School returns in 2025** with an exciting new edition in **Porto, Portugal**. This year's event is **jointly organized by the CONVERGE project**, reflecting a joint effort to advance research and education in next-generation networks.

Why attend?

➡ Visionary keynotes from **Ahmed Alkhateeb** (Arizona State University), **Jakob Hoydis** (NVIDIA), and **Abhimanyu Gosain** (Northeastern University)

➡ **Hands-on Training** with Allbesmart, Trinity College Dublin, Inria, and Keysight on OpenAirInterface, Open RAN, 5G Virtual Networks and Digital Twins

➡ **Expert Insights**: Attend lectures on OpenAirInterface, Point Clouds, Edge Cloud Continuum, Event-Based Vision, Data Management, Standardizatio,n and Licensing

➡ **Connect & collaborate** – network with researchers, industry expert,ts and fellow PhD students

Register now and join us in the vibrant city of Porto. Arrive a couple of days early and come to Porto's legendary São João celebrations before we dive into 6G together. **Registration closes on June 10. Special prices are available for students.** More info on the CONVERGE website.

Fourth Meeting in Barcelona

Barcelona Supercomputing Center (BSC) hosted the fourth Face to Face Meeting of the CONVERGE project on 09 and 10 October 2024.

The face-to-face meeting was important to **discuss and plan the developments** on the gNB, user interface, digital twin, and data management. The presence at BCS provided a greater opportunity to discuss task 2.5, devoted to the machine learning tool.

The attendees also had the opportunity to visit the different labs, namely the **MareNostrum Supercomputer** and other computing facilities at BSC.

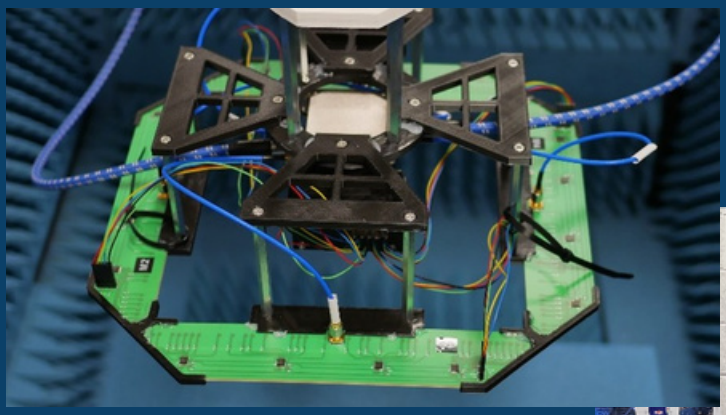
IEEE JC&S Symposium

Allbesmart presented a **CONVERGE gNB prototype** at the IEEE JC&S Symposium held in Oulu in January 2025, showing a stable **end-to-end connection** between the OAI gNB and a commercial off-the-shelf (COTS) Quectel UE, **operating at 28 GHz with 200 MHz bandwidth**. A **web-based dashboard** was showcased, enabling real-time visualization and configuration of the testbed. This platform will be further extended to incorporate a comprehensive set of features for real-time monitoring and control of CONVERGE tools.

Fifth Meeting in Belfast

Queen's University Belfast (QUB) hosted the fifth Face to Face Meeting of the CONVERGE project on 07 and 08 May 2025 at the Centre for Wireless Innovation (CWI), Queen's Titanic Quarter.
The face-to-face meeting provided a comprehensive forum for r**eviewing the progress of various tools and their integration**, planning ahead, discussing ethics and data management strategies, and bringing together stakeholders to effectively guide the project forward.

The attendees also had a **tour of the CWI labs** at QUB showcasing the expertise in wireless communications, electromagnetic sensing, and imaging research. Additionally, attendees enjoyed a walking **tour of the beautiful QUB campus** and the nearby Botanic Gardens.



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