Discover the latest updates in the world of wireless communications from test and measurement experts. Discover more on 5G evolution towards 6G, including O-RAN ecosystem. Rohde & Schwarz and the Politecnico di Milano have the pleasure to invite you to the 5G Seminar.

In particular we will talk about:

- **5G Advanced Release 17/18** and its transit to 6G
- **V2x applications and Integrated Sensing and Communications**
- **5G private networks** performance for industrial/mission-critical applications
- **Overview of OpenRAN and OpenSource implementations**
- **Open RAN** – Interoperability and network performance
abstract

Since it is market introduction in 2019 based on 3GPP Release 15 specifications, 5G NR was largely deployed. According to the Ericsson Mobility report from Dec 2022, 228 service providers offer commercial 5G and serving around 870 million subscriptions. The number is expected to reach 5 billion by the end of 2028. Obviously, the technology evolves over time the same way as previous cellular generations like 4G, 3G and 2G did. This presentation reviews the main enhancements recently added in 5G NR and the planned ones in 5G NR+ known as 5G Advanced. We will further illustrate the main research directions in 6G, for example sub-THz operation, joint communication & sensing (JCAS) and reconfigurable intelligent surfaces (RIS) to name a few. This will also include initial test solutions relevant 6G research.

abstract

This seminar discusses the concept of Open RAN (Radio Access Network) and its motivations for architectural change, such as software-defined networking for wireless networks, management and control complexity on different time scales, virtualization, and interoperability. The seminar explores the history of Open RAN and its evolution from xRAN to C-RAN to O-RAN. It also examines the issues surrounding the functional split between baseband and radio units and the fronthauling technologies and protocols. Additionally, the seminar discusses RAN disaggregation and virtualization, the challenges associated with HW acceleration, and software-based radio units. Overall, this seminar provides a comprehensive overview of Open RAN and its key elements.

abstract

Opening the network architecture can foster innovation and accommodate individual needs. However, it also brings new challenges in terms of interoperability between the network equipment of different vendors. Testing this equipment is crucial to ensure interoperability between components from different vendors and to deliver the same customer experience as with traditional RAN. In this seminar, Melanie Mauersberger will talk about the required test steps from validating individual components to verifying end-to-end network performance.

abstract

6G wireless technology targets to revolutionize many fields, one is the mobility industry including intelligent, cooperative, and sustainable mobility environment. High-performance connectivity is a key enabler of connected and autonomous vehicles (CAVs). Fast and massive vehicle-to-everything (V2X) connectivity among vehicles, either over infrastructure network and among themselves, is based on high-frequency 5G mmwave and 6G sub-THz technology. MIMO technology is purposely designed for collimated connectivity. However, collimated MIMO V2X connectivity is impaired by blockage and antennas' misalignments due to the vehicle's movement, research directions are aiming to mitigate these effects. Multi-technology sensing (camera, lidar, radar) is essential for augmented perception in CAVs. Radar and communication functionalities are complementary one another, such that a novel paradigm is currently researched as successfully combine these two technologies. A remarkable goal of integrated communication and sensing is to provide an accurate positioning service. Talk will cover all these topics framed within the future mobility paradigm.