IEEE AP/ED/MTT North Italy Chapter

Chapter Seminar

Machine learning-enabled radio wave propagation modeling for complex indoor environments

Dr. Sen LIU

National Institute of Information and Communications Technology, Tokyo, Japan

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Time: 11:00 (Italy Time)

Location: **online** at https://unitn.zoom.us/j/89132312773?pwd=RLFxWsfbvmagN51qNKOtYbuByxMoIM.1

Contact:
Prof. Giacomo OLIVERI
(giacomo.oliveri@unitn.it)

Modeling radio wave propagation in complex indoor environments remains a significant challenge due to the dynamic nature of reflections, diffractions, scattering, and multipath effects. Traditional propagation models, including empirical and deterministic approaches, often fall short in capturing these phenomena with the precision and efficiency required for emerging communication technologies, such as 5G and beyond. In this talk, a cutting-edge, machine learning-enabled framework designed to enhance the accuracy and efficiency of propagation model will be presented. This approach utilizes large-scale datasets derived from realistic simulations, together with advanced machine learning techniques, to train models capable of adapting to the complexities of diverse environments, offering a significant improvement in terms of flexibility, prediction accuracy, and computational efficiency. By demonstrating what is possible in indoor radio wave propagation modeling, this presentation aims to provide a forward-looking perspective on how machine learning-driven innovations will revolutionize wireless network design, paving the way for more resilient, adaptive, and high-performance communication systems.

Dr. Liu (Member, IEEE) received the B.E. degree from the University of Electronic Science and Technology of China, Chengdu, China, in 2015, the M.E. degree from Waseda University, Kitakyushu, Japan, in 2017, and the Ph.D. degree from Tohoku University, Sendai, Japan, in 2020. He was a researcher with the Electromagnetic Compatibility (EMC) Laboratory, National Institute of Information and Communications Technology, Tokyo, Japan from 2020 to 2024. He is currently a senior researcher with Ericsson Research, Gothenburg, Sweden. He is an IEEE AP-S YP Ambassador of 2025 class. His current research interests include antenna arrays evolutionary computation, radio wave propagation modeling, reconfigurable intelligent surfaces, B5G/6G, and machine learning. Dr. Liu received Young Encouragement Award from IEICE Technical Committee on Antennas and Propagation in 2021. He was a recipient of URSI Young Scientist Award in GASS 2021 and IEEE AP-S Japan Young Engineer Award in 2021. He was presented with the Young Excellence Award from IEICE Technical Committee on Electromagnetic Compatibility in 2024

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