

# EEI-Kolloquium

## High-accuracy Integrated Sensing and Communications in Mobile Systems

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IMDEA Networks, Madrid

**Donnerstag, den 16.10.2025, 14:00 Uhr**

Seminarraum 01.021, Cauerstraße 7, 91058 Erlangen.

**Abstract:** The next generation of mobile and wireless communication systems offers high bandwidth, enabling not only high data rates but also highly accurate localization and environmental sensing. This talk explores the practical design aspects of these systems, with a particular focus on the challenges of integrated sensing and communication (ISAC). We will present a system that achieves highly accurate device localization using carrier-phase information. We will also demonstrate how to use existing communication hardware to perform low-cost, radar-like monitoring of human movement indoors. This approach can enable fine-grained sensing applications like simultaneous activity recognition and person identification of multiple subjects. Finally, we will discuss how to achieve coherent imaging of dynamic scenes with moving targets. The talk will emphasize the underlying concepts and practical implementation, supported by testbed designs and experimental results.

**Bio:** Joerg Widmer is Research Professor and Research Director of IMDEA Networks in Madrid, Spain, where he leads the Wireless Networking Research Group. Before, he held positions at DOCOMO Euro-Labs in Munich, Germany and EPFL, Switzerland. His research focuses on wireless networks, ranging from extremely high frequency millimeter-wave communication and wireless sensing to mobile network architectures. Joerg Widmer authored more than 250 conference and journal papers and three IETF RFCs, and holds 14 patents. He was awarded an ERC consolidator grant, the Friedrich Wilhelm Bessel Research Award of the Alexander von Humboldt Foundation, a Mercator Fellowship of the German Research Foundation, a Spanish Ramon y Cajal grant, as well as 16 best paper awards. He is an IEEE Fellow and Distinguished Member of the ACM.