UNIVERSITÀ POLITECNICA DELLE MARCHE

Dipartimento Ingegneria Informazione

Seminar Announcement

22 September 2026, 11:30-12:15, Engineering Faculty, 140/2

Ultra-low power IoT: enabling accurate sensing every time and everywhere

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The global Internet of Things network hit 16.7 billion connected devices by the end of 2023. While IoT devices are widespread in everyday life, their adoption for real-time data acquisition is limited, particularly in scenarios requiring a "deploy-and-forget" approach with virtually infinite device lifespan. Achieving ultra-low power in IoT devices involves a delicate balance between processing, sensing, powering, and transmitting units. This balance must be maintained to ensure both energy efficiency and measurement accuracy in complex monitoring. The integration of artificial intelligence into embedded devices introduces "virtual sensing," enhancing accuracy while optimizing energy consumption in ultra-low power IoT monitoring platforms.

Alessandro Pozzebon received the M.Sc. degree in computer science engineering and the Ph.D. degree in information engineering from the University of Siena, Siena, Italy, in 2006 and 2012, respectively. He is currently an Associate Professor with the Department of Information Engineering, University of Padova, Padua, Italy, where he teaches with the Laboratory of Electronic Measurements. His main research interests include the development of distributed measurement applications based on low-power wide area network (LPWAN), wireless sensor network (WSN), and RFID technologies in several different application fields, from healthcare to cultural heritage and environmental monitoring.

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