Wednesday May 10, 2017 - h. 15:00-16:00 – Università del Salento (UniSALENTO) - Lecce, Italy

"**Wireless Systems and Devices for Opportunistic Location-based Services**"

Speaker: Dr. Federico VIANI

Abstract

The estimation of target positions and movements in indoor scenarios is the key-aspect of many location-based services (LBS). Indoor LBS market is expected to generate more than USD 8 billion by 2020. Accordingly, the rapid spreading of applications based on the knowledge of user position, movement, and behaviour has stimulated the investigation of more and more efficient localization techniques. The seminar will provide an overview of different wireless localization solutions based on the integration of advanced electromagnetic technologies.

The opportunistic exploitation of wireless platforms will be presented as an alternative way to support the estimation of both cooperative and non-cooperative targets using the wireless architectures already deployed for heterogeneous communication purposes.

Different methodologies for the real-time processing of the wireless signals will be presented and a selected set of experimental results will be discussed to demonstrate the practical applicability of the opportunistic principle to real-world scenarios.

Federico Viani received the M.S. degree in Telecommunication Engineering from the University of Trento in 2007, and the PhD degree in Information and Communication Technology in 2010. Dr. Viani is a Research Associate (Post-Doc) at the Department of Information Engineering and Computer Science (University of Trento) and a member of the ELEDIA Research Center. Since 2010, Dr. Viani is the official teacher of the course "Design Techniques for Wireless Communications" offered by the University of Trento. Dr. Viani is author/co-author of over 100 peer reviewed papers on international journals and conferences, where he has also co-organized and co-chaired convened sessions. The research activities of Dr. Viani are oriented to the design and development of wireless systems, devices, and methodologies in the framework of Electromagnetic Fields for the solution of complex electromagnetic problems, such as the wireless localization and tracking of active/passive targets. He is also involved in the design of distributed monitoring systems by means of wireless technologies, like wireless sensors networks, for smart cities and smart buildings applications, and in the development of decision support strategies for fleet management and emergency-related applications. Dr. Viani serves as a reviewer for international journals, including IEEE Transactions on Antennas and Propagation, IEEE Antennas and Wireless Propagation Letters, Progress in Electromagnetic Research/Journal of Electromagnetic Waves and Applications, IEEE Transactions on Vehicular Technologies, IEEE Internet of Things Journal, Journal of Intelligent Systems, and Sensors. Dr. Viani is a Member of the IEEE, of the IEEE Antennas and Propagation Society, and the European Microwave Association (EuMA).

References

[1] H. Ahmadi, A. Polo, T. Moriyama, M. Salucci, and F. Viani, "Semantic wireless localization of WiFi terminals in smart buildings," *Radio Science*, vol. 51, no. 6, pp. 876-892, Jun. 2016.

[2] F. Viani, F. Robol, A. Polo, P. Rocca, G. Oliveri, and A. Massa, "Wireless architectures for heterogeneous sensing in smart home applications – Concepts and real implementations," *Proceedings of the IEEE*, vol. 101, no. 11, pp. 2381-2396, Nov. 2013.

[3] F. Viani, “Opportunistic occupancy estimation in museums through wireless sensor networks,” *Microwave and Optical Technology Letters,* vol. 57, no. 8, pp. 1975-1977, Aug. 2015.

[4] F. Viani, P. Rocca, M. Benedetti, G. Oliveri, and A. Massa, “Electromagnetic passive localization and tracking of moving targets in a WSN-infrastructured environment,” *Inverse Problems*, vol. 26, 074003, pp. 1-15, Mar. 2010.

[5] F. Viani, P. Rocca, G. Oliveri, D. Trinchero, and A. Massa, “Localization, tracking, and imaging of targets in wireless sensor networks: An invited review,” *Radio Science*, vol. 46, RS5002, 2011.