

IEEE CRFID Distinguished Lecturer Proposal – ALICE BUFFI

RFID position measurements: the challenge of fine-scale localization and tracking

Abstract: During the Fourth Industrial Revolution, the Internet of Things (IoT) and the Industrial IoT (IIOT) together with Automation, Big Data, Artificial Intelligence, Cloud Computing and Autonomous Robots, aim to increase the efficiency and flexibility of production by leading the way of the Fifth Industrial Revolution. The Industry 5.0 changes perspective, by focusing on research and innovation to encourage the development of industry at the service of mankind while respecting the planet resources. In this panorama, the Radio Frequency Identification (RFID) technology with its capabilities of identification, sensing and capability will be still a protagonist. In particular, the possibility to measure the position of workers, items, robots and all industry actors represents an essential functionality in an industrial scenario where man is at the centre.

In this speech, the challenge of performing RFID-based localization in industrial scenario will be discussed. The main localization methods will be introduced together with the recent technical advancements, by discussing the trade-offs between system infrastructure and localization accuracy. Examples of practical implementations in real industrial scenarios will be presented by describing also the recent activities on RFID-based localization at the University of Pisa.

SHORT BIO



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ALICE BUFFI (Senior Member, IEEE) received the B.S. and M.S. (summa cum laude) degrees in Telecommunications Engineering and the Ph.D. degree (Doctor Europaeus) in “Applied electromagnetism in electrical and biomedical engineering, electronics, smart sensors, nanotechnologies”, from the University of Pisa, Pisa, Italy, in 2006, 2008 and 2012, respectively. In 2011, she was a Visiting Ph.D. student with the Queen Mary University of London, London, U.K.. Since 2012, she has been with the University of Pisa, where she is currently an Associate Professor with the Department of Energy, Systems, Territory and Construction Engineering. She has co-authored several international journal papers and international conferences contributions, one European patent and one European patent application. Her current research topics include measurement methods to locate static or moving items through radio frequency identification (RFID) systems operating at the ultra-high-frequency (UHF) band in Industry 4.0 scenarios. Besides, she has interests in classification methods for smart gates and smart storage systems and ageing process in battery cells. Dr. Buffi is a member of the IEEE Instrumentation and Measurement Society, the IEEE Antennas and Propagation Society and of the Council on RFID. She was a recipient of the Best Paper Award at the IEEE RFID-TA 2019 International Conference and of the Young Scientist Award from the International Union of Radio Science, Commission B, in 2013 and 2016. She serves as an Associate Editor for the IEEE Transactions on Instrumentation and Measurement and for the IEEE Journal of Radio Frequency Identification. She also serves as Steering Committee Chair of the IEEE Journal of RFID and as Chair of the IEEE CRFID’s Technical Committee on Motion Capture and Localization (IEEE TC-MoCap).