

# Mobility In Wireless Sensor Networks - State-of-the-Art, Challenges and Approaches

Fernando Boavida

<https://www.cisuc.uc.pt/people/show/102>

Centre of Informatics and Systems of the University of Coimbra  
Portugal

Universidad de Málaga, 26 de septiembre de 2014

## Abstract

Targeting an increasing number of potential application domains, wireless sensor networks (WSN) have been the subject of intense research, in an attempt to optimize their performance while guaranteeing reliability in highly demanding scenarios. However, hardware constraints have limited their application, and real deployments have demonstrated that WSNs have difficulties in coping with complex communication tasks – such as mobility – in addition to application-related tasks. Mobility support in WSNs is crucial for a very high percentage of application scenarios and, most notably, for the Internet of Things. It is, thus, important to know the existing solutions for mobility in WSNs, identifying their main characteristics and limitations. With this in mind, we firstly present the state-of-the-art for mobility support in WSNs, as well as the corresponding challenges. We then present the Network of Proxies (NoP) assisted mobility proposal, which relieves resource-constrained WSN nodes from the heavy procedures inherent to mobility management. The presented approach was implemented and evaluated in a real platform, demonstrating not only its advantages over conventional solutions, but also its very good performance in the simultaneous handling of several mobile nodes, leading to high handoff success rate and low handoff time.

*Keywords:* wireless sensor networks, mobility, 6LoWPAN, proxies.

## About the speaker

Fernando Boavida received his PhD in Informatics Engineering in 1990, and he currently is Full Professor at the Department of Informatics Engineering (DEI) of the Faculty of Sciences and Technology of the University of Coimbra. He is the founder of the Laboratory of Communications and Telematics (LCT) of DEI, the Director of the Centre for Informatics and Systems of the University of Coimbra (<http://cisuc.uc.pt>), and the Strategic Director for Communications and Information Technology of the University of Coimbra.

His main research interests are wireless sensor networks, mobility, quality of service, and computer networks in general. He is author/co-author of more than 160 international publications (books, book chapters, refereed journals and conference proceedings) and 50 national publications. He was the chairman of the Program Committee of QoS'2001, IDMS-PROMS'2002, NETWORKING 2006, WWIC 2007, FMN 2008, EWSN 2010, FMN 2012, IWQoS 2012, and ACM SIGCOMM FhMN 2013 international conferences/workshops. He has been involved in numerous program committees of major international conferences, including INFOCOM 2006 and 2007. He participated in many European projects, such as E-NEXT (FP6 Network of Excellence on Emerging Networking Experiments and Technologies) EuQoS (End-to-end Quality of Service support over heterogeneous networks, IST-FP6-2004-004503), WEIRD (WiMAX Extension to Isolated Research Data networks, IST FP6 Integrated Project 034622), OpenNet (Open Interconnect for the Internet Community, IST-FP6 Specific Support Action 035185), CONTENT (Content Networks and Services for Home Users, IST-FP6-0384239), GINSENG (Performance Control in Wireless Sensor Networks", ICT-FP7-224282) and MICIE (Tool for systemic risk analysis and secure mediation of data ex-changed across linked CI information infrastructures", ICT-FP7-225353).

He is a senior member of the IEEE and a licensed Professional Engineer. He is a member of the Editorial Advisory Board of the Computer Communications journal.