Building Wireless Sensor Networks: Reliability, Standards and Other Practical Aspects

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http://wmnc09.pg.gda.pl/

Wireless sensor networks (WSNs) face the challenge of ensuring end-to-end communication while operating over individually unreliable wireless links. While single channel solutions enable best-effort operation, critical applications require high reliability and real-time guarantees. The multi-hop nature of a WSN, narrow-band interference, persistent multi-path fading and algorithmic complexity make achieving reliable communication an interesting challenge.

The aim of this talk is to expose an academic and industrial audience to the latest cutting-edge R&D challenges associated with (1) the design of reliable communication protocol for low-power lossy networks, and (2) the implementation of such solutions on the latest hardware.

The talk will be structured in two parts: the first part is dedicated to the latest developments in standardization bodies such as the IEEE802.15.4E and IETF ROLL working groups; the second part is dedicated to understanding the implementation challenges. This second part consists of a hands-on programming tutorial on the Texas Instrument eZ430-RF2500 platform. The attendees will be provided with necessary hardware, software and code snippets.

This talk is tailored to the level of practicing engineers and advanced researchers with both academic and industrial background who are interested in the fundamentals and design of wireless sensor networks. With an expected market size of approximately $2b by 2012 at a compound annual growth rate of 41.9%, these networks are gaining seriously in momentum in both the academic and industrial communities. It is hence anticipated that this talk will be very well attended.

Thomas Watteyne is a postdoctoral researcher at the Berkeley Sensor & Actuator Center, University of California in Berkeley, working with Prof. Kristofer S.J. Pister on reliable low-power communication for Wireless Sensor Networks. From October 2005 to September 2008, he was a research engineer at France Telecom R&D/Orange Labs working on Energy Efficient Self-Organizing Wireless Sensor Networks, together with the CITI Laboratory, Lyon, France. He obtained his PhD in Computer Science (2008) and MSc in Telecommunications (2005) from INSA Lyon, France. He has published several journal and conference papers, holds two patents, has contributed to two books and participated in standardization activities. He has been TPC member and member of the organizing committee of various conferences. He is reviewer for numerous IEEE and non-IEEE journals and a Member of the IEEE.

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