Short Range Radio Research in Twente

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DATE: Wednesday October 6, 2010
TIME: 14:00 – 15:00
Room EEB 248

Abstract: The research and education by the Telecommunication Engineering Group at the University of Twente is dedicated to physical layer topics in communications. Three research tracks have prominence: Short Range Radio, Microwave Photonics, and Electromagnetic Compatibility. Arjan is active in the Short Range Radio division, and will briefly outline the interests and activities of this group. Furthermore he will present some results of the research that he did during his short sabbatical in Belfast last year. This concerns the performance analysis of a frequency offset modulation scheme using wideband noise carriers. The main advantage of such a scheme is that it enables fast receiver synchronization without channel adaptation, while providing robustness to multipath fading and in-band interference. This is important for low-power wireless systems with bursty traffic, such as sensor networks. In the talk a semi-analytical framework for evaluating its bit error rate performance in wideband frequency-selective fading channels will be described. Some numerical results will be presented, based on channel models developed in the IEEE 802.15.4a channel modeling subgroup. These illustrate that the considered system can be designed with a lower fading margin than a narrowband system.

Biography: Arjan Meijerink received the MSc and PhD degrees in Electrical Engineering (both with honours) from the University of Twente, Enschede, The Netherlands, in 2001 and 2005, respectively. His PhD research was on coherence multiplexing for optical communication systems, and was performed under supervision of Prof. W. van Etten, in the Telecommunication Engineering (TE) Group. From 2005 to 2007 he was a Postdoctoral Researcher at the TE Group, carrying out research on photonic beamformers for broadband phased array receive antennas, using fully integrated, ring resonator-based optical beamforming networks. Since 2007 he has been an Assistant Professor in the TE group. He teaches an undergraduate course on random signals and noise, and is involved in research on new radio transmission techniques for short-range applications, such as wireless sensor networks. His particular interest is in resilient, low-power UWB transmit-reference modulation techniques, stochastic channel modeling, and UWB-based ranging and localization techniques. In 2009 he was a Visiting Lecturer at the Wireless Communications Research Group, at the Queen's University Belfast, Northern Ireland, UK. Currently he is a Visiting Scholar in the WiDeS Group. His research work involves stochastic channel modeling and time-of-arrival estimation using UWB signals.

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