

Tutorial Abstract for ISITC 2007

Wireless Sensor Networks: From Theory to Practice

Abstract: Wireless sensor networks combine distributed sensing, computing, and wireless communications into a powerful technology that offers unprecedented resolution, unobtrusiveness, and autonomous operation for countless applications. At the same time, they offer numerous challenges, in particular the strict energy constraints, the distributed operation, and the scalability. This tutorial provides a comprehensive and self-contained introduction to wireless sensor networks, covering all the relevant aspects from the basic theory to real-world applications. It consists of four parts:

1. Introduction: Motivation, relevance, and important applications
2. Challenges and solutions: Difference to other wireless networks; modelling issues; energy-efficient network protocols; performance limits and quality-of-service issues
3. Practical aspects: Hardware overview; experimental results and measurements.
4. Conclusions and outlook.

Biography: Martin Haenggi is an Associate Professor of Electrical Engineering at the University of Notre Dame. He completed his doctoral work at the Signal and Information Processing Laboratory of ETH Zürich, Switzerland, in 1999. Before joining Notre Dame in 2000, he spent a postdoctoral year at the University of California at Berkeley, and in 2007/08 he will be on a sabbatical leave at the University of California at San Diego. His main research interests are wireless ad hoc and sensor networks. He has published more than 50 articles on ad hoc and sensor networks, covering a broad range of topics from the mathematical theory to experimental work and applications. He currently serves on the Editorial Board of the Elsevier Journal on Ad Hoc Networks, and from 2005-06, he was as a Distinguished Lecturer on sensor networks for the IEEE Circuits and Systems Society. In 2005, he received an NSF CAREER award, and he is the principal investigator on several other awards from NSF, DARPA, and DTRA on sensor network-related projects.

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