Session Introduction: Wireless Sensor Networks

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Sensor networks comprise a large number of low-cost miniaturized computers each acting autonomously and equipped with short-range wireless communication, limited processing and memory, and a physical sensing capability.

Decisions in daily life are based on the accuracy and availability of information. Sensor networks can significantly improve the quality of the information as well as the ways of gathering it. For example sensor networks can help to get higher fidelity information, get information in real time, get hard-to-obtain information and reduce the cost of getting information. Therefore it is assumed that sensor networks will be applied in many different areas in the future. Application areas might be production surveillance, traffic management, environmental supervision, medical care or military applications.

One of the most important part of a wireless sensor network is the communication between the nodes. The character of the communication used in a wireless sensor network has a huge impact on the usability of a sensor network. For example, the lifetime of a sensor network in which single nodes are battery-powered is essentially influenced by the used communication patterns. Therefore a lot of research in wireless sensor networks is currently focused on the communication aspect. To be able to optimize communication in wireless sensor networks it is important to consider all communication layers. The goal of this special session is to present and discuss current problems on the various communication layers.

The first paper by Matthias Hollick, Ivan Martinovic, Tronje Krop and Ivica Rimac is entitled "A Survey on Dependable Routing in Sensor Networks, Ad hoc Networks and Cellular Networks". The paper introduces the concept of routing dependability, describing the trustworthiness of a routing system. The paper provides definitions and insights which assist in developing and operating more dependable routing networks.

The second paper by Utz Roedig, Andre Barroso and Cormac J. Sreenan with the title "Determination of Aggregation Points in Wireless Sensor Networks" presents an algorithm that allows efficient aggregation of data packets transported through a wireless sensor network.

The last paper "Sensor Networks for Health and Emergency Care" by Ralf Ackermann, Helma Töpper and Ralf Steinmetz describes and analyses a sensor network used for health monitoring of elderly people.

The new results described in the papers of this session will improve design and operation of wireless sensor networks.