

Competences of the FhG-HHI and FhG-MCI in the Field of Wireless Sensor Networks

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Research Activities (1)

- Multiple antenna systems
 - From (information) theory to hardware implementation: Many years of experience in the design of multiple antenna systems.
 - Multiple antenna techniques for energy efficient sensor networks: Optimal diversity-multiplexing tradeoff depending on fading channel states and **hardware power consumption**.
 - Robustness against fading effects.
 - Beam-forming and MIMO for multicast communication.
- Network control (wireless automation)
 - Communication (and control) strategies.
 - Stability, observability and reliability issues.
 - Many applications in the area of building automation, process control and industrial automation.

Research Activities (2)

- Multi-user communications
 - Transmit and receive strategies, multi-user diversity
- Cooperative systems
 - Virtual MIMO systems
 - Cooperative relaying
 - Cooperative diversity
 - Distributed space-time coded protocols
 - Bidirectional relaying (network coding for wireless networks)
 - Statistical cooperation
 - Reduce and/or exploit redundancy due to the correlation in sensor data
- Medium access protocol
 - Distributed power control
 - Scheduling in time and frequency domain, distributed implementation

Research Activities (3)

- Routing
 - Load balancing, routing with data compression
 - Situation-based routing: Queue backlogs, interference, energy states
- Network coding
- Cross layer design

