UNIVERSITY OF TWENTE.

WiSE
Faculty of Electrical Engineering, Mathematics, and Computer Science

Centre for Wireless and Sensor Systems
Wireless and Sensor Systems

• “Everything” is networked
  – Even very small things like sensors and actuators
  – Explosion in the number of connected end devices

• In-network processing
  – Scalability and reliability
  – Process data in network end devices
  – Decentralized and localized control
  – Services executing inside the network
Smart objects
Smart objects
Opportunistic Sensing

- Use the technology and people around us to observe, discover, and act on the patterns that shape our lives.
  - Smart phones
  - Sensor networks
  - Available infrastructure
  - Ad hoc communication

- A new approach that empowers all of us to illuminate and change the world around us.
Underwater sensor networks
Structural health monitoring
Pont de la Poya
Switzerland
WiBRATE Case Studies

- High speed trains
- Automotive manufacturing
- Fully automated condition-based maintenance and control
- Rotor blade monitoring & control
- Gas turbine monitoring & control
Energy Harvested Wireless Sensor Node
Smart textile
Smart Grid

- The problem
  - Energy and comfort in houses and public buildings
  - climate, environment, prices, comfort

- Opportunities
  - smart appliances, distributed power, smart grid.
“Dutch Panda”

- Wildlife monitoring
Research areas of WiSE

- **Platforms**
  - System on Chip, smart textiles, sensors, smart phones
- **Networked Embedded Systems**
  - System software, distributed processing, (real time) operating system
  - Self*, energy efficient, reliable, coexistence, cross-layered, ..
  - High density networks, heterogeneity, mobile networks, ..
- **Distributed services & data management**
  - Service management, privacy, resource management
  - Activity detection, event detection, sensor fusion, outlier detection, context awareness, distributed signal processing
  - Localization, time synchronization
- **Abstractions, mechanisms, and algorithms**
  - Virtual machines, business rules, opportunistic sensing
  - Neural networks, fuzzy logic, artificial intelligence
- **Development and deployment**
  - Reprogramamability, debugging facilities, data dissemination, …
Wise Groups

- Pervasive Systems (PS)
- Computer Architectures for Embedded Systems (CAES)
- Design and Analyses of Communication Systems (DACS)
- Short Range Radio (TE/SRR)
- Integrated Circuit Design (ICD)
- Biomedical Signals and Systems (BSS)
Be a WiSE guy!

WiSE
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