Future Directions in Sensor Data Management: A Panel Discussion

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Message

There are many opportunities for DMSN research in the concrete. To seize these, target specific applications.

- Research in the *abstract*
  - Define a mathematical model; show fundamental results
- Research in the *concrete*
  - Is there one concrete, real problem that this research solves?
  - Or, does the research contribute clearly to solving that problem?

Research In the Concrete

- Many papers claim practical, near-term applications, but
  1. the applications are formulated too abstractly to be real
  2. the contributions do not possess these applications after all
  3. the applications are not followed up upon in the empirical studies
- Worst case
  - no applications, no fundamental contributions, little progress
  - we (readers and authors alike) are fooling ourselves

- Let one challenging, real problem motivate the research!
  - Choose a *specific* problem setting and take it seriously
  - Find a real, *concrete* application, and address this application

Mixed Feelings About Smart Dust

- An exciting, captivating vision, but too far fetched

- When will we throw sensors in the paint before painting the bridge?
- When will we litter the rain forest with sensors thrown out from an aircraft?

- Still no time soon
- It is time to get real

Sensor Network Diversity

- Application diversity
  - Smart dust: the paint and the rain forest
  - Intelligent transport systems – in a vehicle, in an entire transportation infrastructure
  - Smartphone users – social apps, citizen reporters

- Research area diversity
  - Covered by many disciplines in computer science as well as science and engineering
  - A multi-disciplinary research area

- One size fits nobody
  - Choose your application
  - Collaborate with application domain experts
  - Collaborate with scientists from other disciplines

Directions

- Target real(istic) applications
- Indoor
- Include control in response to sensing
- Real/virtual world integration
- Enable green systems
- Security, safety, privacy
- Accuracy vs. performance
- High update rates
- Self everything, resilience, fail-safe