

Distributed Algorithms for Sensor Networks (SCADDS)

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- n **Develop distributed algorithms for sensor networks which provide:**
 - ä **Unattended operation**
 - ä **Robustness under dynamic operating conditions**
 - ä **Scalability to thousands of sensors**
 - ä **Energy efficiency (for untethered operation)**
- n **To provide this, the focus is on:**
 - ä **Automatic adaptation (for unattended robustness)**
 - ä **Local processing (for scalability and efficiency)**

Our Approach: Directed Diffusion

- n **Key constructs that support automatic adaptation and local processing**
 - ä **Naming data, not nodes, makes it robust to node mobility, failure, disruption**
 - ä **Rapid, energy efficient adaptation by localizing interactions to neighboring nodes**
 - ä **Processing (correlation, aggregation) of data in “transit” promotes scaling of signals and energy as network/density increases**

How Diffusion uses these constructs

Requests and responses diffuse based on named data in localized hop-by-hop manner

Adaptation to preferable paths achieved by reinforcing/inhibiting local gradients

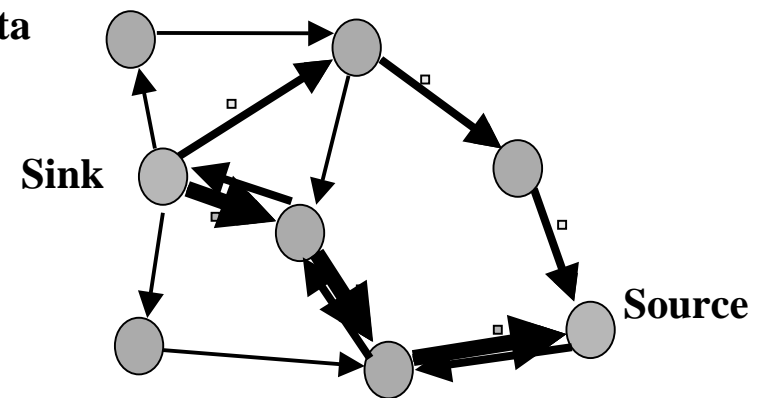
Allows flexible distributed algorithm design

More easily express local processing of sensor data

Unlike end-to-end communication in Internet

More easily adapt network paths

When nodes fail or move



“What do you see in the southwest?”