Distributed Algorithms for Sensor Networks (SCADDS)
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- Develop distributed algorithms for sensor networks which provide:
  - Unattended operation
  - Robustness under dynamic operating conditions
  - Scalability to thousands of sensors
  - Energy efficiency (for untethered operation)

- To provide this, the focus is on:
  - Automatic adaptation (for unattended robustness)
  - Local processing (for scalability and efficiency)
Our Approach: Directed Diffusion

- Key constructs that support automatic adaptation and local processing
  - Naming data, not nodes, makes it robust to node mobility, failure, disruption
  - Rapid, energy efficient adaptation by localizing interactions to neighboring nodes
  - 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?”