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Autonomous Intelligent Mobile Micro Server

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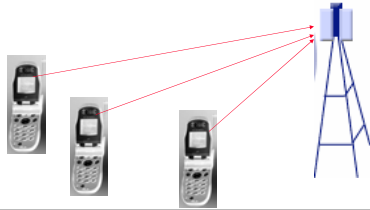
Autonomous Intelligent Mobile Micro Server

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Introduction: Three kinds of wireless communication

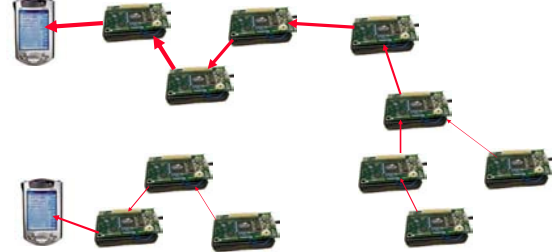
- **Single hop**

Nodes should have powerful radios
Similar to cellular networks



- **Multihop routing**

Nodes have to spend energy to relay other, farther node's data



Problem Description: Mobile Data Sink

- **Moving the robot**

Robot can move anywhere vs
Robot moves on a trail

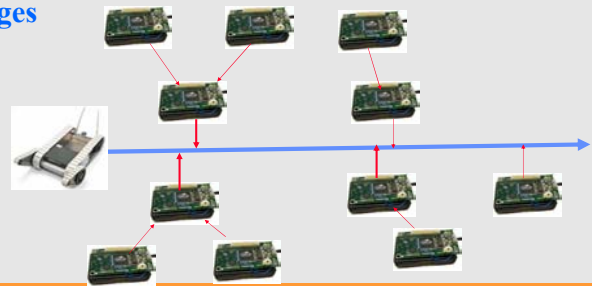
- **Learning the topology of the sensor field**

- **No data loss (buffer overflow) at the nodes**

- **Adaptively changing the speed of the robot**

Spend more time at locations where channel is bad

Key Challenges



Proposed Solution: Move the robot in a sensor field collecting data from the nodes

Algorithm (on robot)

- **Application built on top of Tiny Diffusion.**
 - Robot subscribes for Interest on Sensor Data.
 - Static nodes subscribe for Interest on Acknowledgement
- **Startup: In the first few rounds, the robot moves at a constant speed through the network**
 - Stores the received data
 - Sends out acknowledgements
- **Steady State: Connectivity based Feedback mechanism**
 - Sees which all nodes sent less data
 - Waits for some time at the location where it hears first from this node
 - Hope to get the previously missed data (missed due to bad channel/collisions)

Advantages

- Energy saving for the motes (need not participate in relaying other's data)
- Security is not a big issue
- Network need not be connected
- Sensing range can be more than radio range

Disadvantage

- Large latency for data

Algorithm (on static nodes)

- Subscribe for Interest on Acknowledgement.
- Send out data if there is an Interest (robot in vicinity)
- Wait for Acknowledgement
- Retransmit if Ack did not arrive within some interval.

Mobile Micro Server

