國立臺北大學 資訊工程學系
NTPU, Department of Computer Science and Information Engineering

Wireless and Mobile Networks

Syllabus

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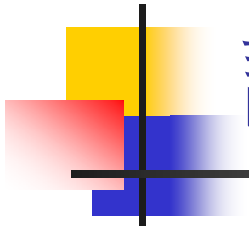
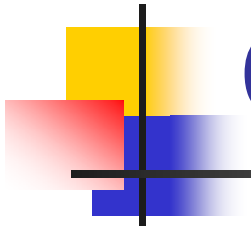
Department of CSIE
National Taipei University



課程內容大綱

- Chapter 1: **Motivation & applications**
- Chapter 2: **Single node architecture**
- Chapter 3: **Network architecture**
- Chapter 4: **Medium access control protocols**
- Chapter 5: **Introduction of IEEE 802.11/Bluetooth**



Cont.

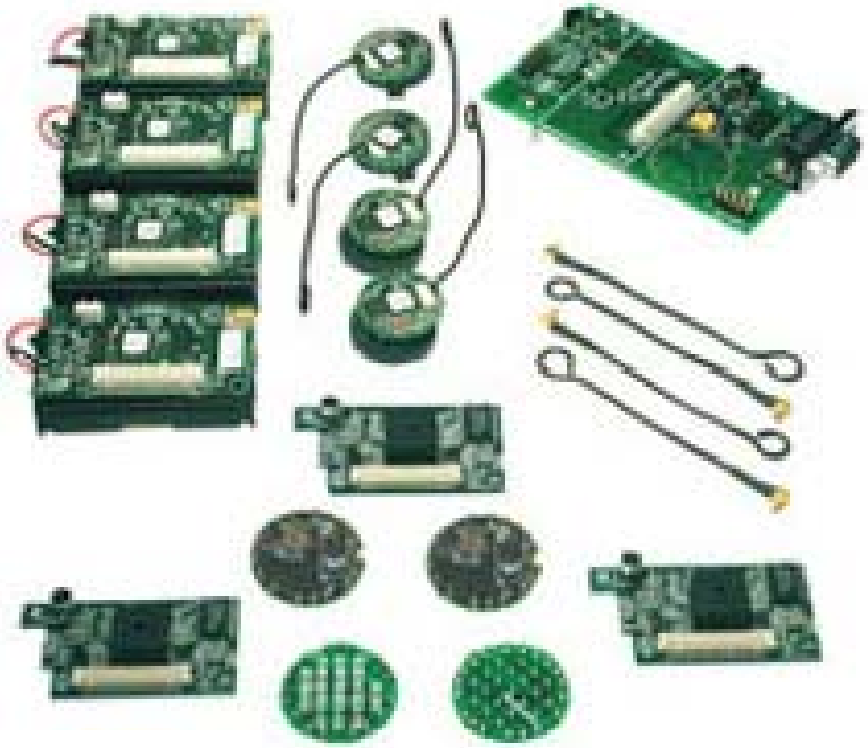
- Chapter 6: **Relay-Enabled Medium Access Control Protocol for MANETs**
- Chapter 7: **Directional and Smart Antenna**
- Chapter 8: **Broadcast I:**
- Chapter 9: **Broadcast II: Broadcast Storm**

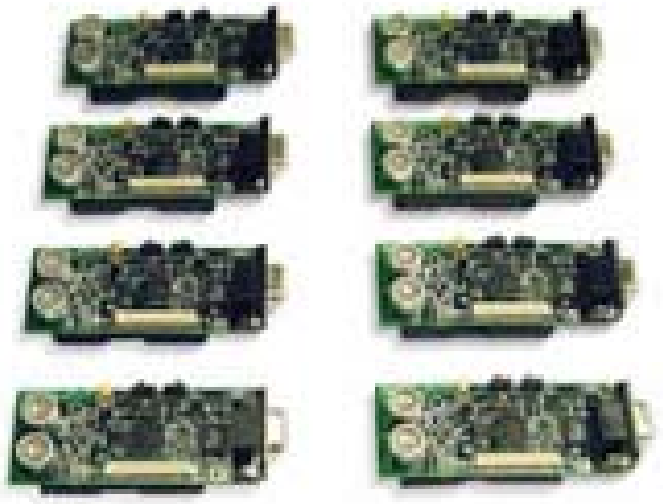
Cont.

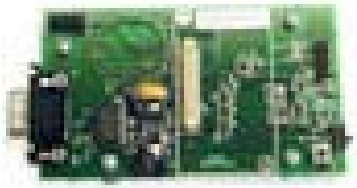
- Chapter 10: **Multicast**
- Chapter 11: **Routing/QoS Routing**
- Chapter 12: **QoS Routing on MIMO MANETs**
- Chapter 13: **Mobicast Routing Problem on WSNs**
- Chapter 14: **Vehicular Ad Hoc networks**
- Chapter 15: **Underwater Networks**

Wireless Sensor Networks

Mote Kits





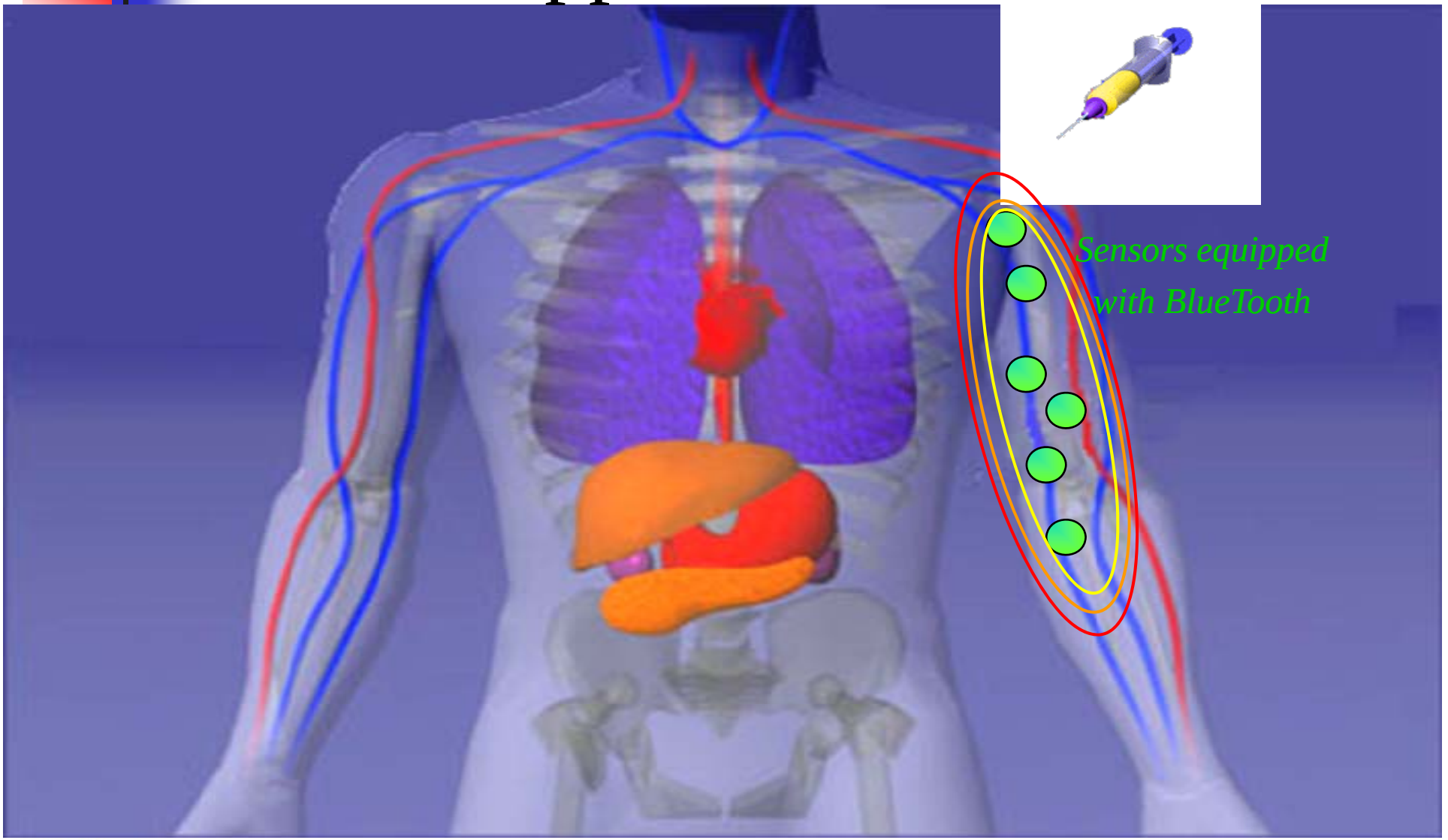


Chapter 1: **Motivation & applications**

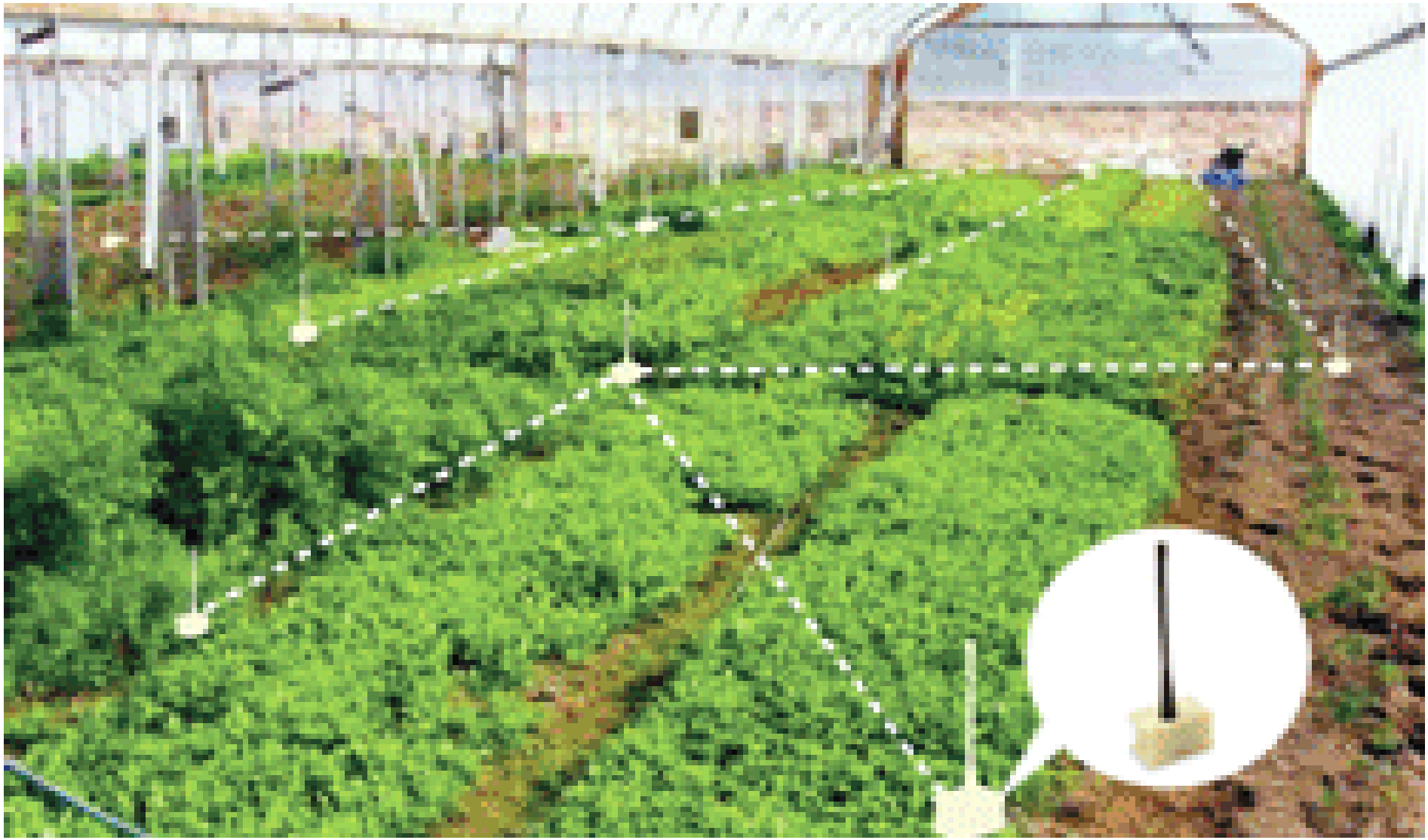
Example of Wireless Bio-Sensor

Medical and **Healthcare** Applications

Source: USC Web Site

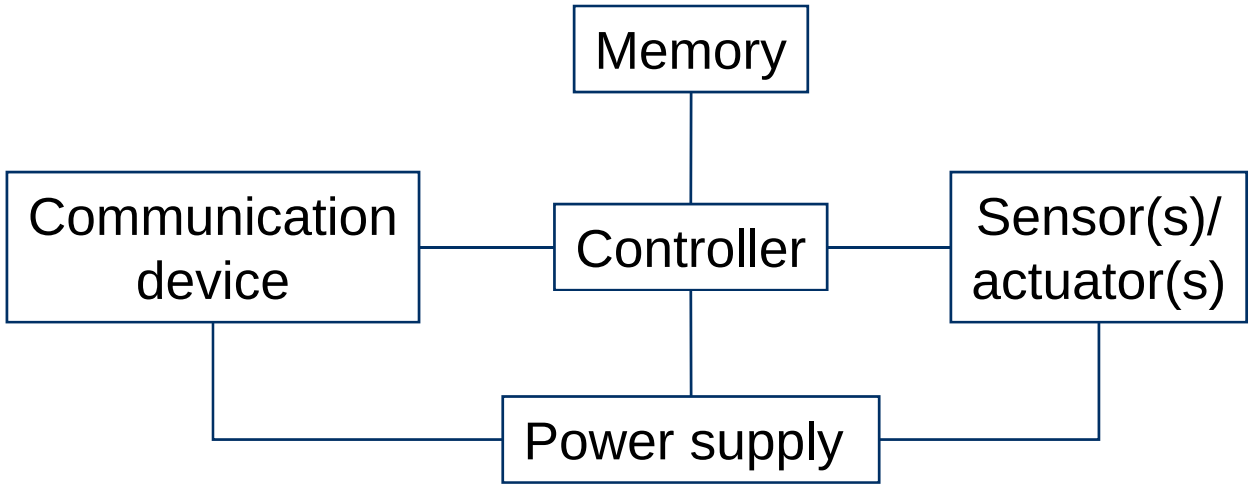


Environment Monitoring System

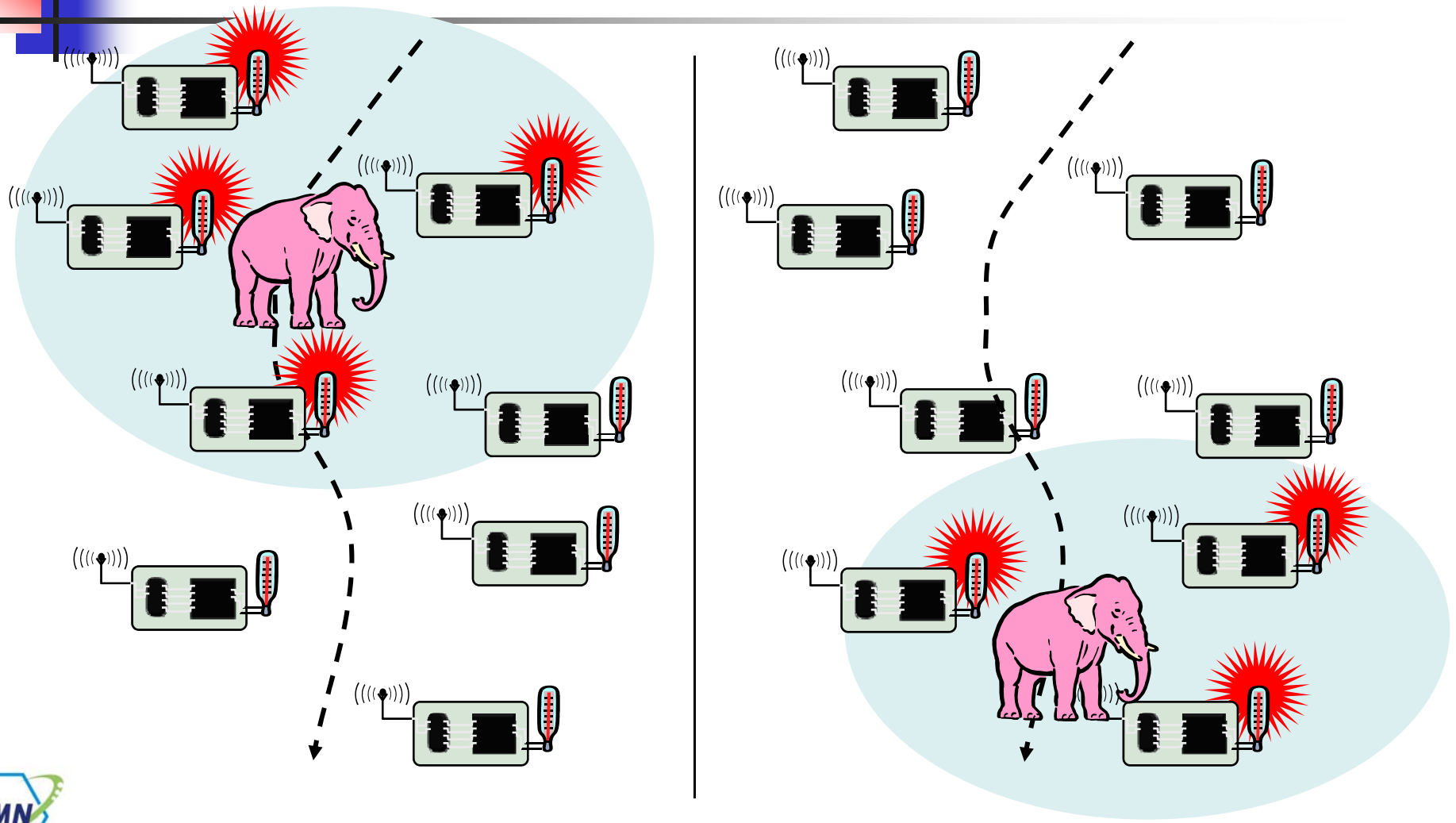


Sensors in Unknown Terrain

Chapter 2: **Single node architecture**

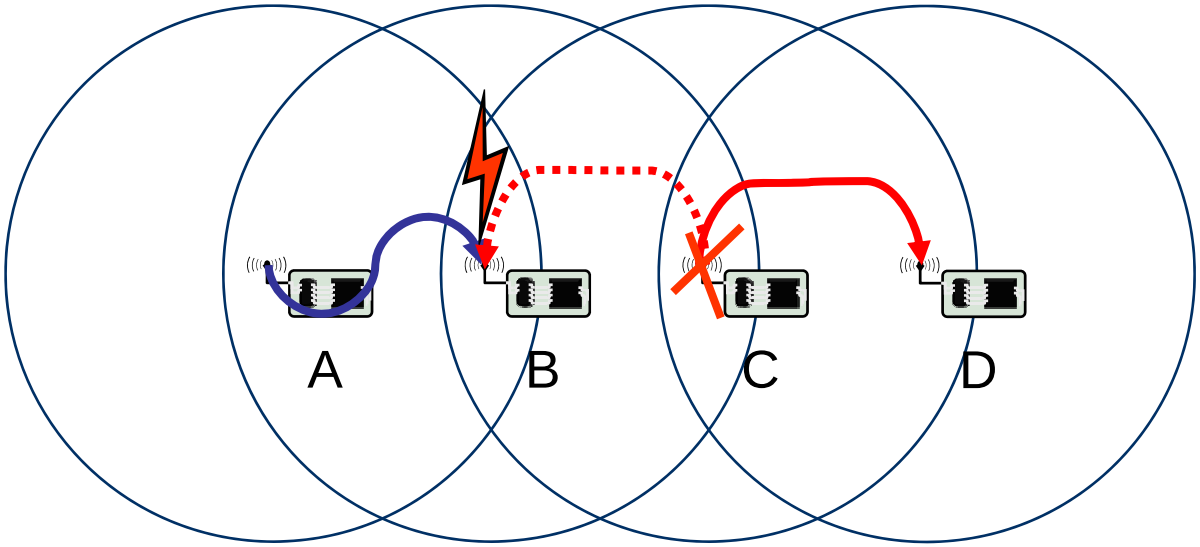


Chapter 3: **Network architecture**



Chapter 4: **Medium access control protocols**

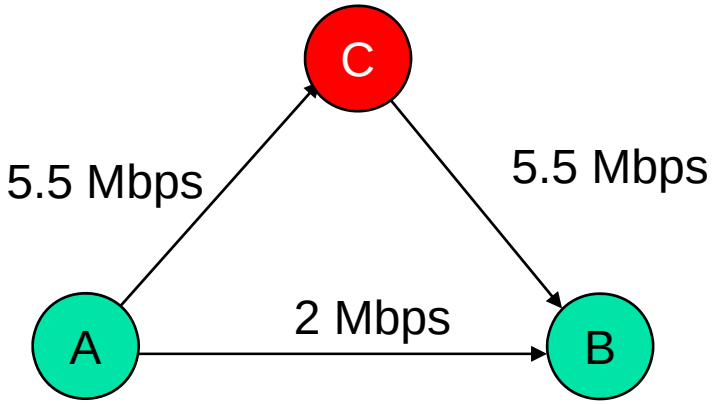
Hidden terminal scenario:



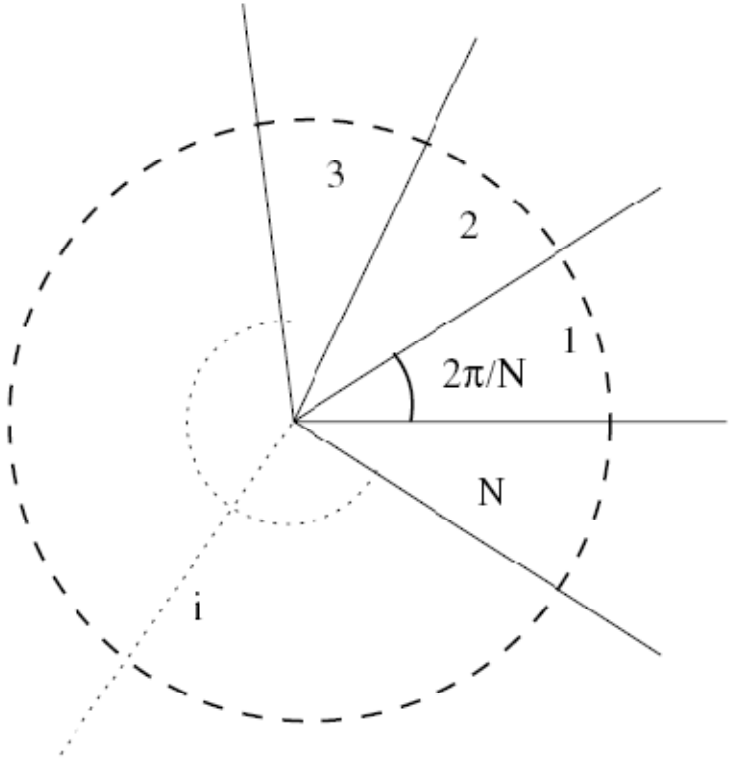
Also: recall exposed terminal scenario

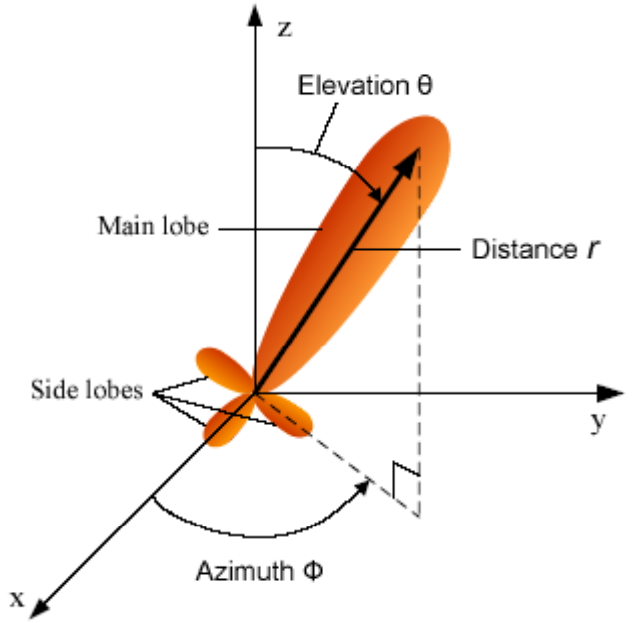
Chapter 5: **Introduction of IEEE 802.11/Bluetooth**

Chapter 6: **Relay-Enabled Medium Access Control Protocol for MANETs**



Chapter 7: **Directional and Smart Antenna**





Chapter 8: **Broadcast**

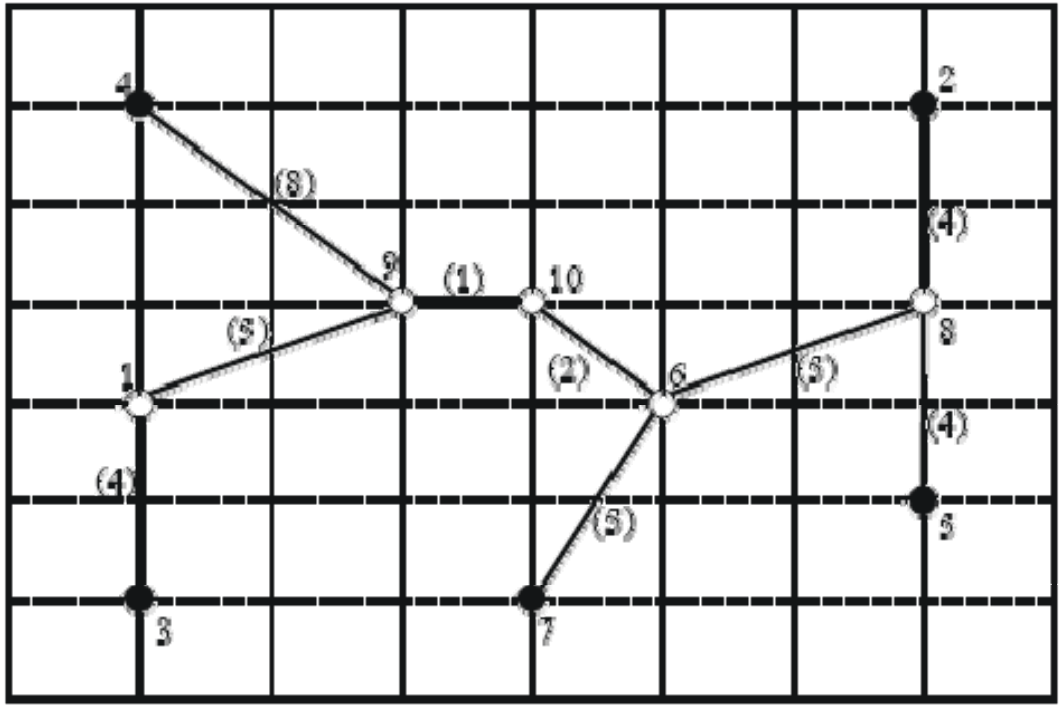
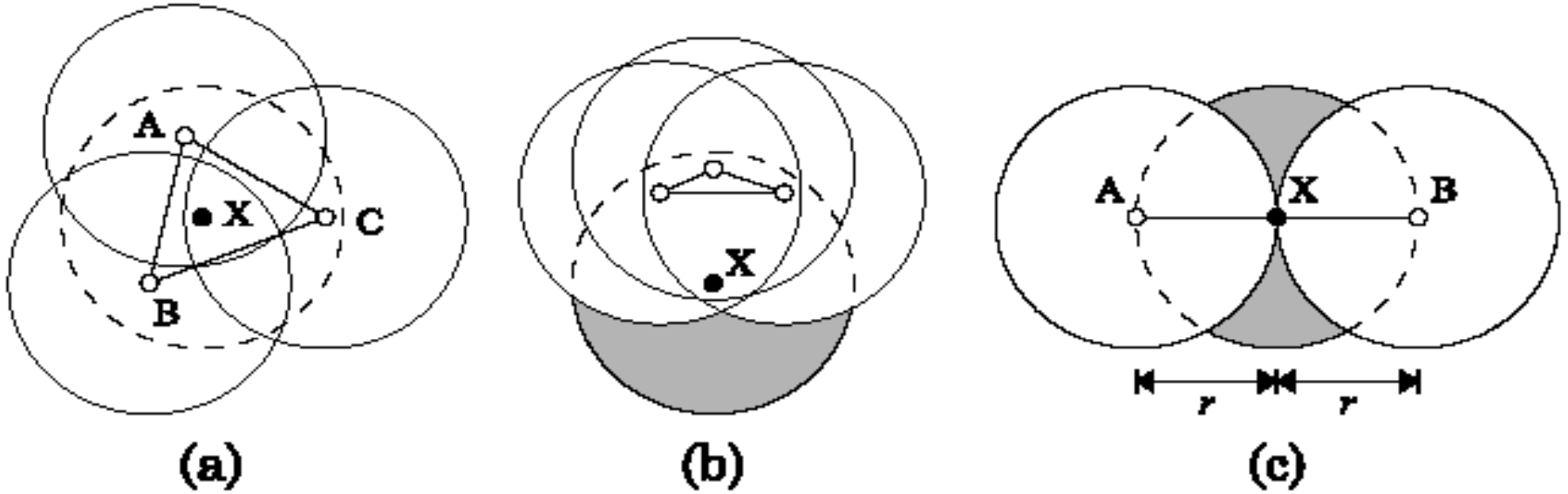
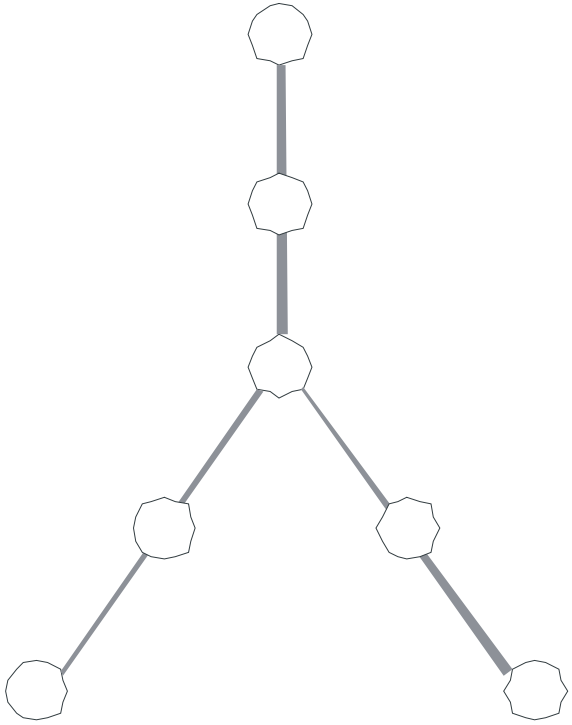


Fig. 3: A MST broadcasting tree

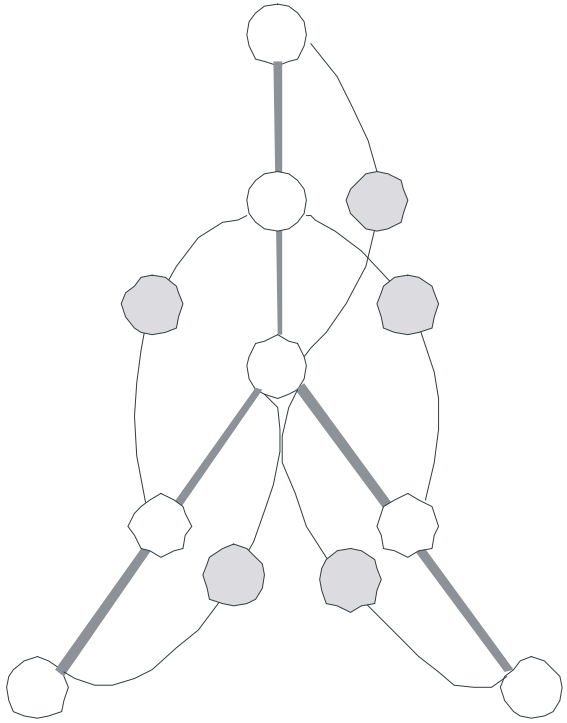
Chapter 9: **Broadcast II: Broadcast Storm**



Chapter 10: **Multicast**

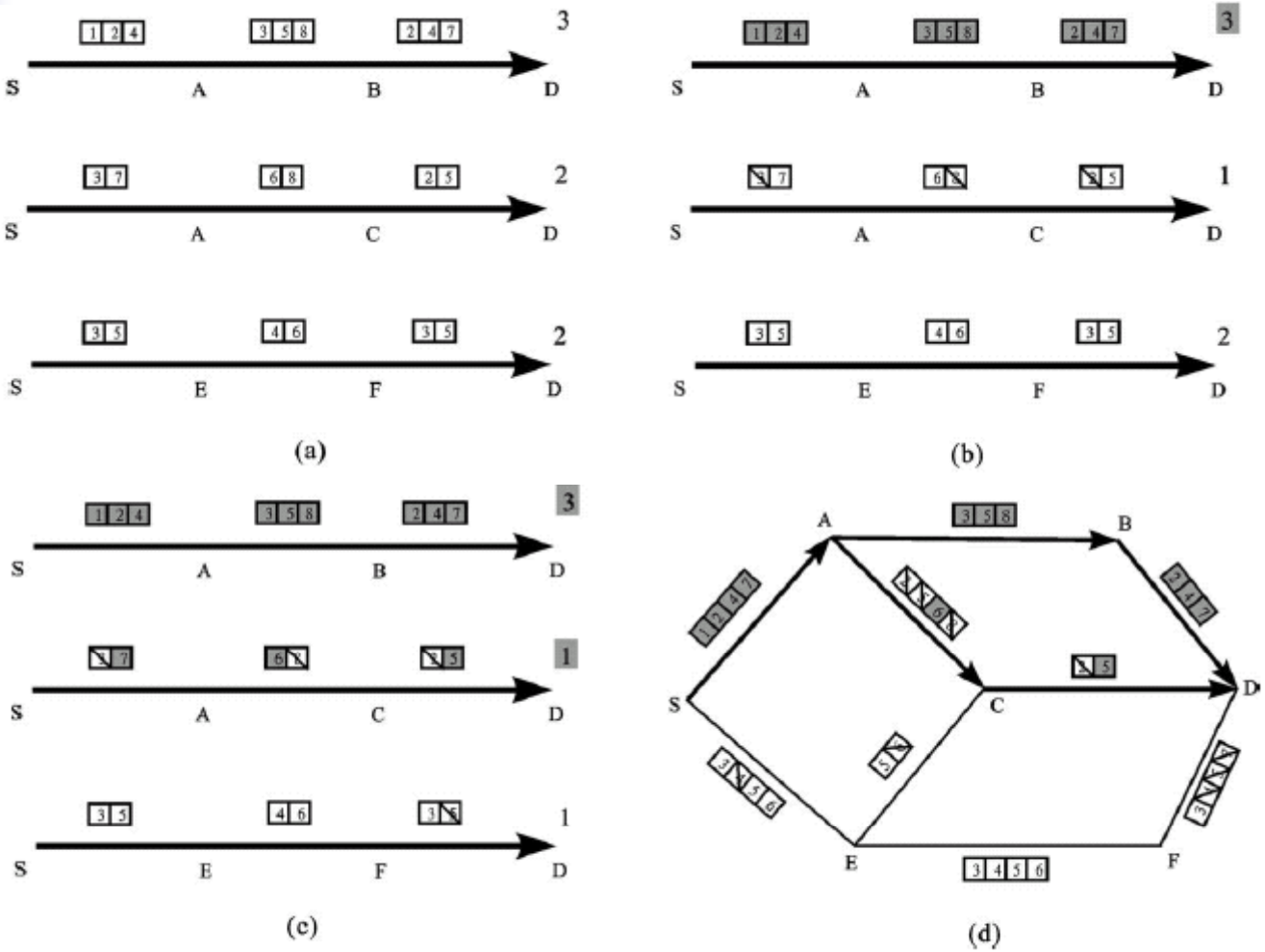


(a)

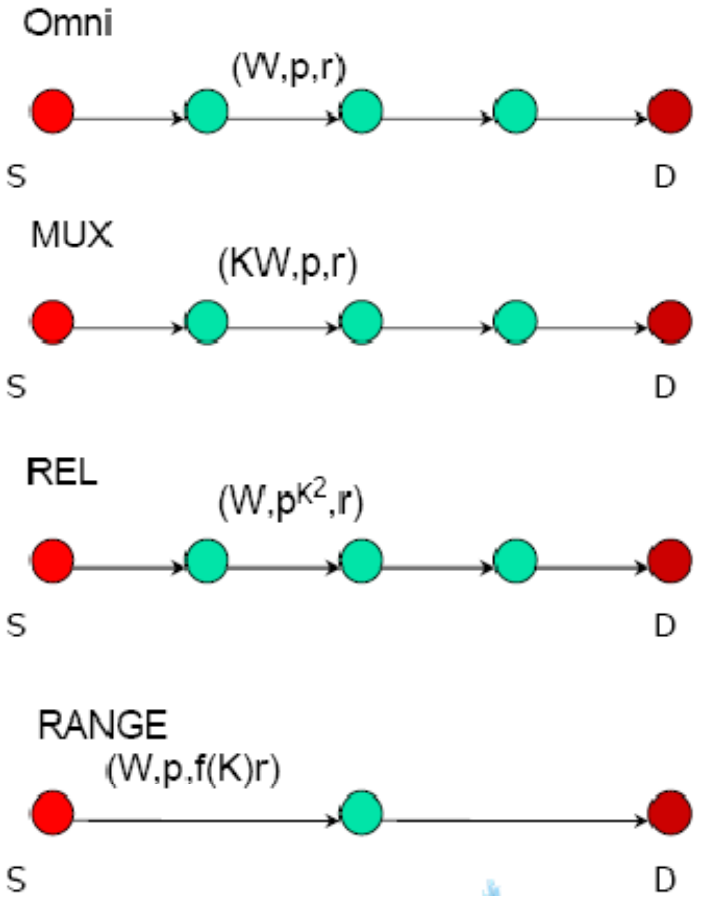


(b)

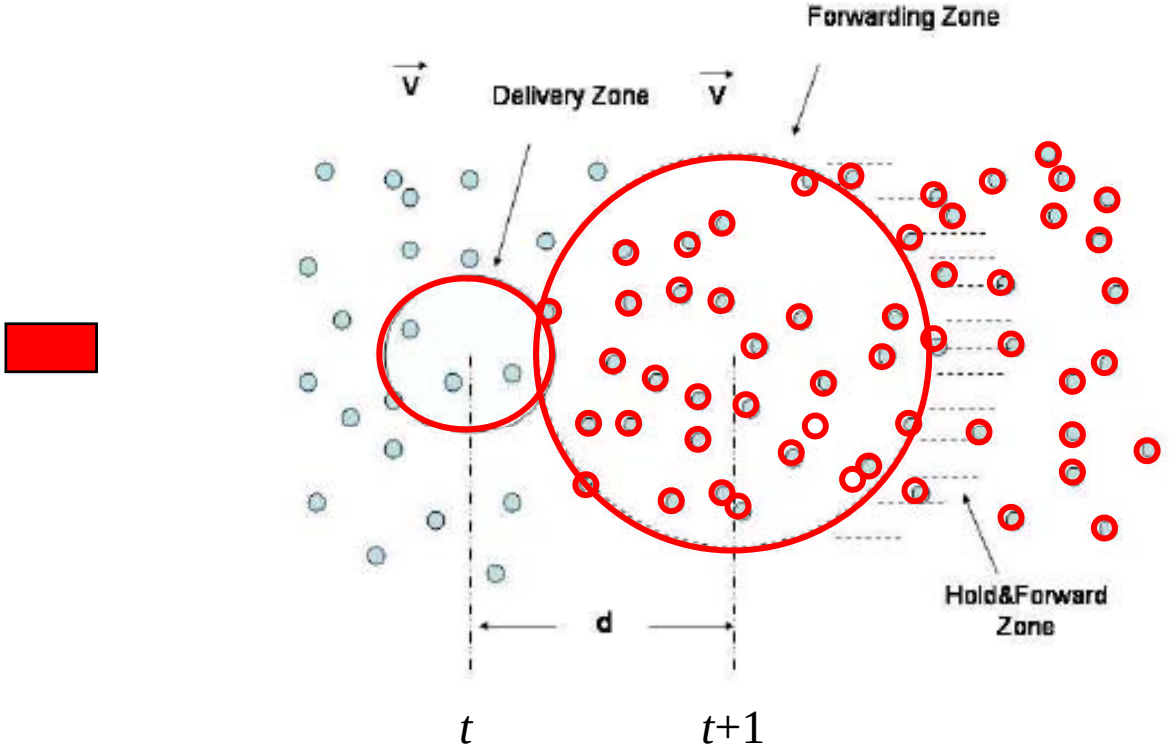
Chapter 11: **Routing / QoS Routing**



Chapter 12: **QoS Routing on MIMO** (Multiple Input Multiple Output) **MANETs**

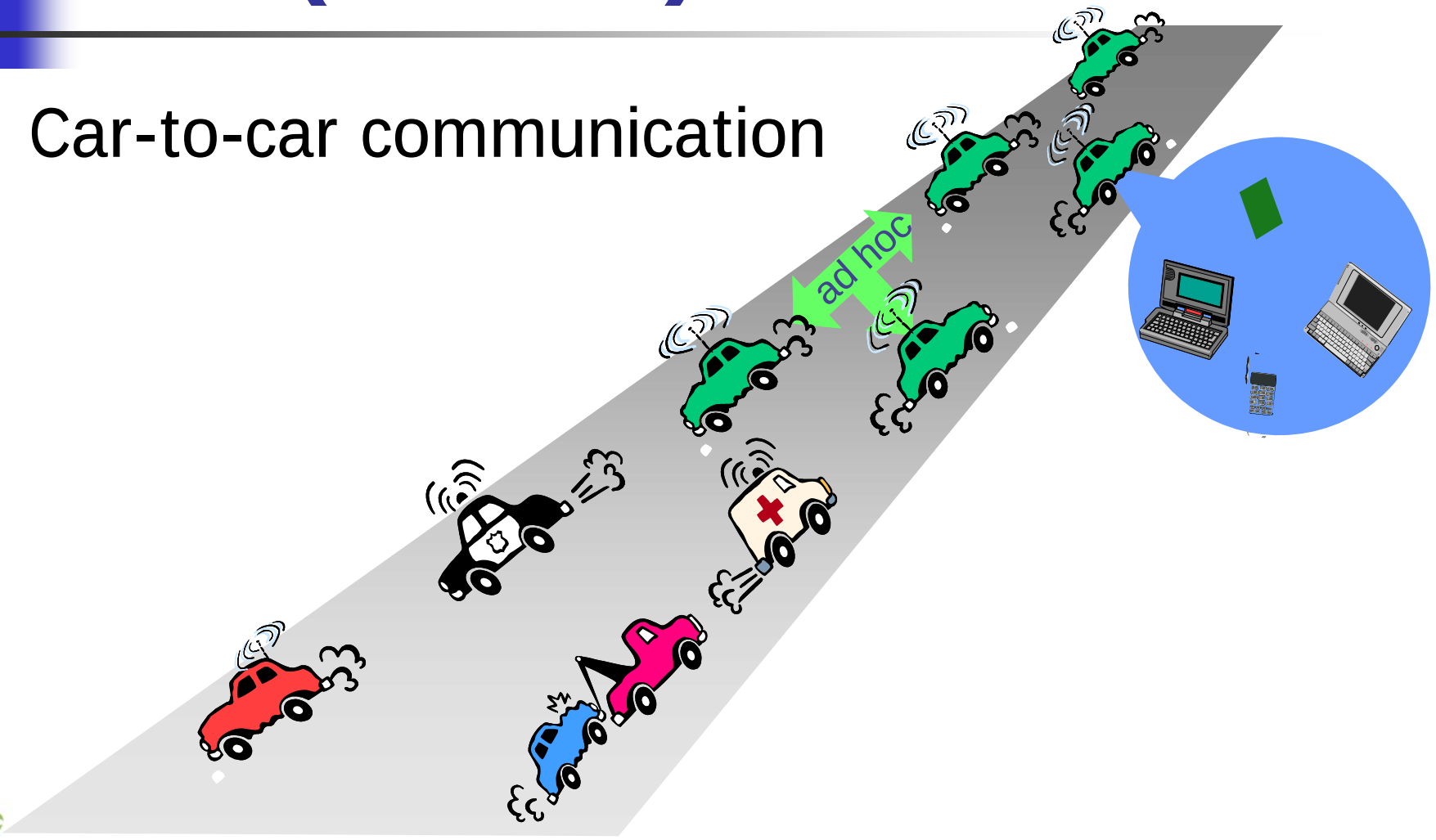


Chapter 13: **Mobicast Routing Problem on WSNs**

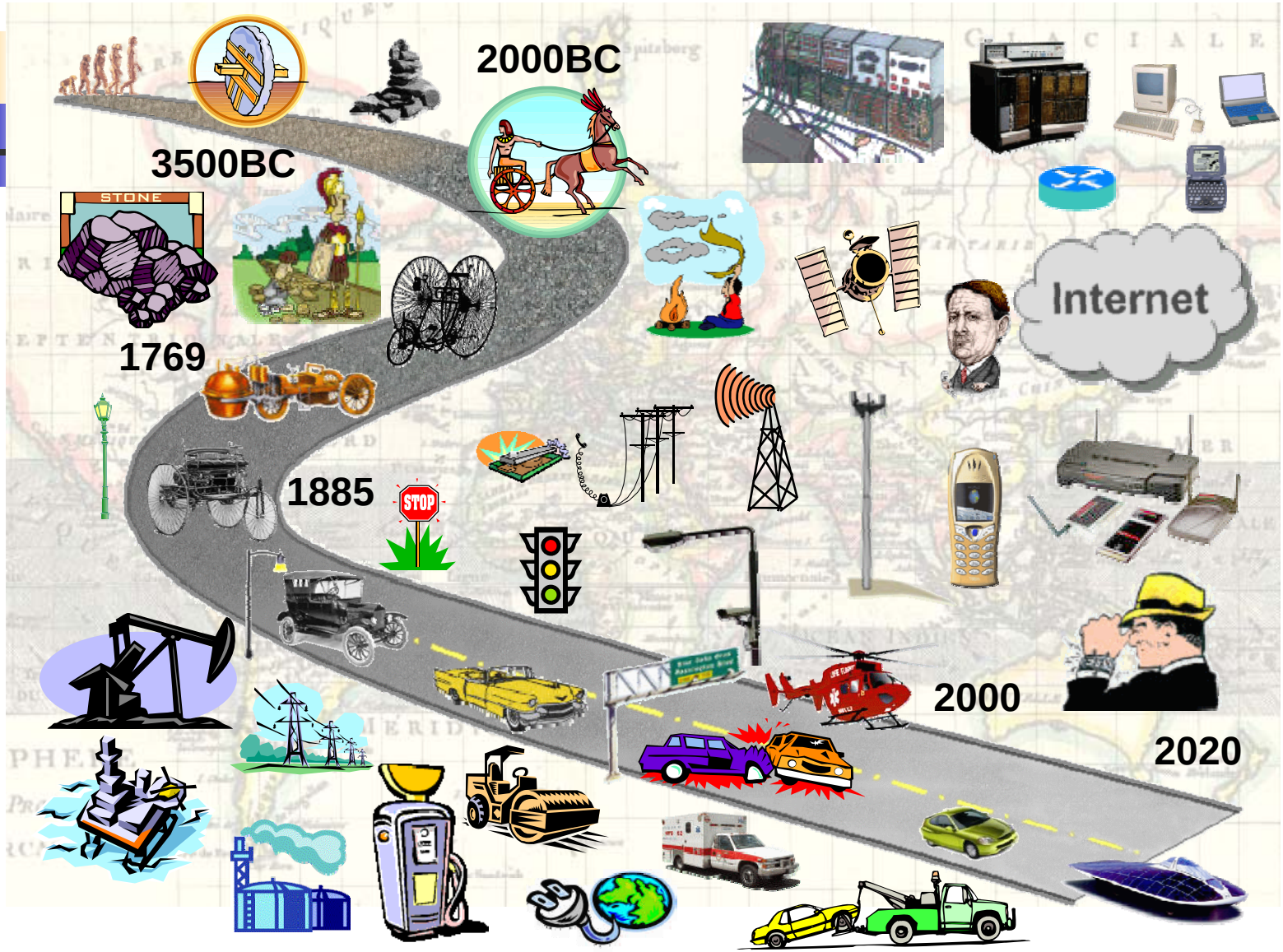


Chapter 14: **Vehicular Ad Hoc (Sensor) Networks**

- Car-to-car communication

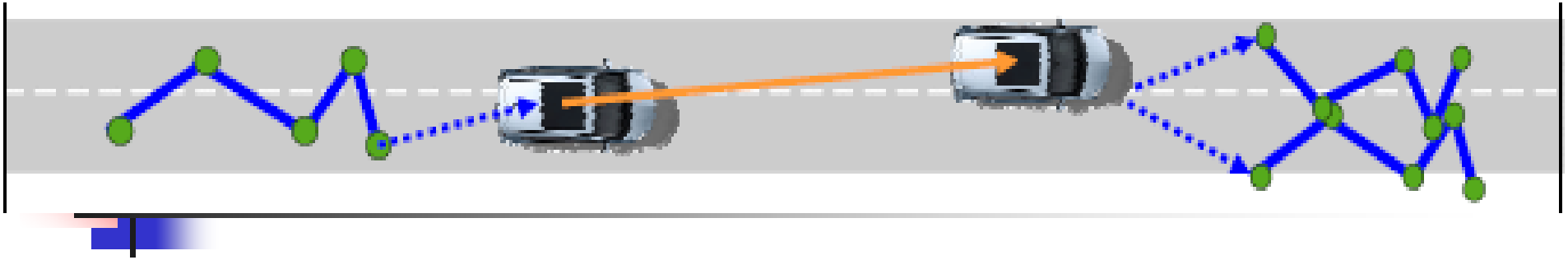


from Telcordia



Vehicle Infrastructure Integration (VII) [from Telcordia]

from Telcordia

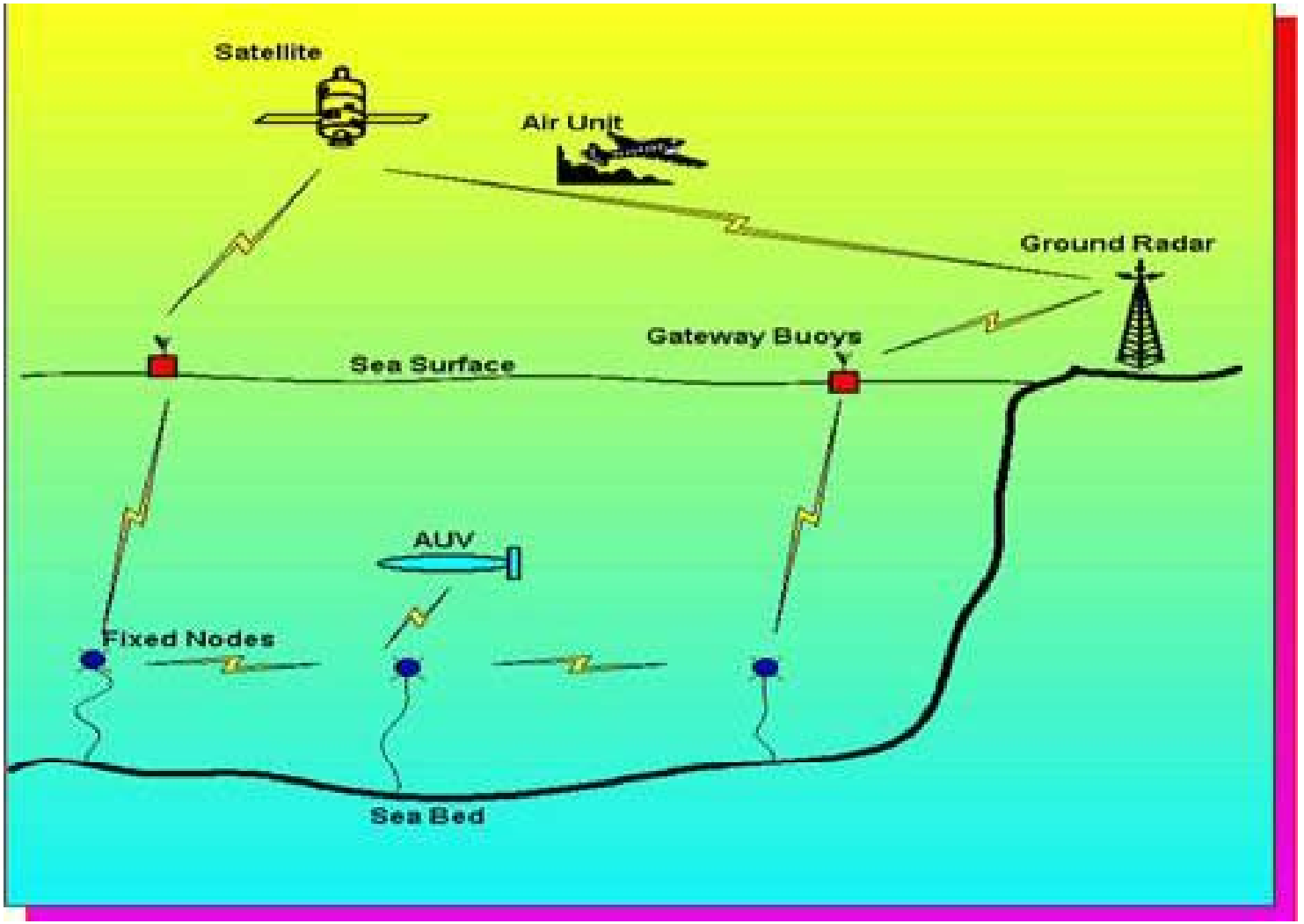


- **1. Information flow within the Wireless Sensor Network**
  - - Task: detect & report events to certain gateway sensor node
- **2. Information transition from WSN to Vehicular Ad-Hoc network**
  - - Task: Notify Vehicles of events
- **3. Propagation of Information inside Vehicular Ad-Hoc network**
  - - Task: Long-range propagation
- **4. Store data from Vehicular Ad-Hoc Network into Wireless Sensor Network**
  - - Task: Preserve information
- **5. “Physical data transport”, “data mule”**
  - - Task: Exploit node mobility for data dissemination

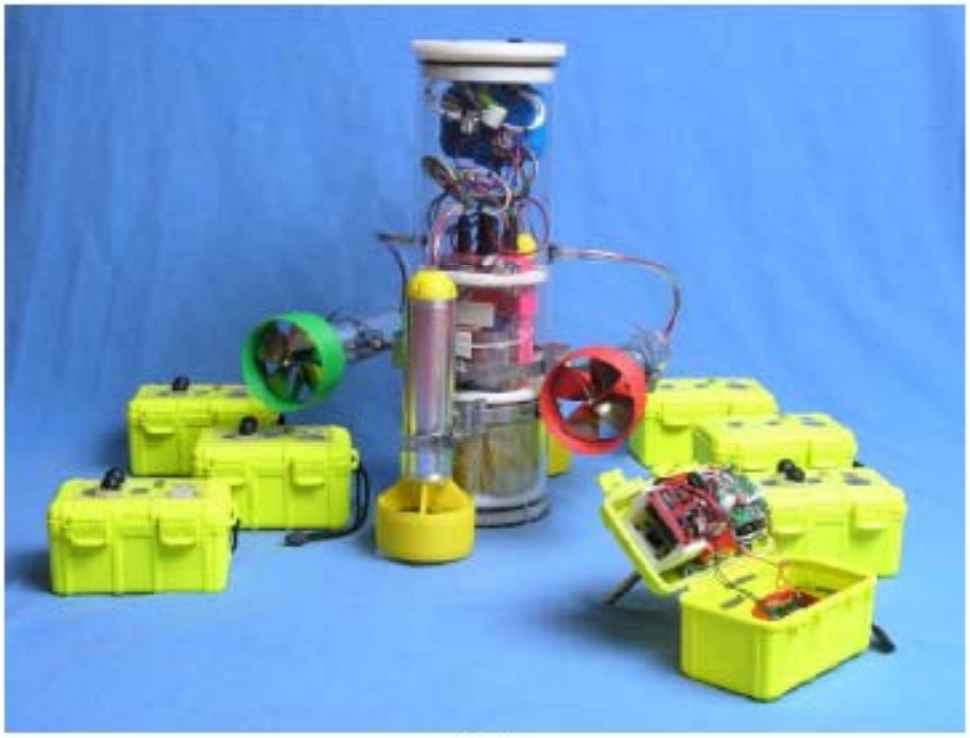
Chapter 15: **Underwater Networks**

Underwater Acoustic Sensor Networks (UW-ASN)

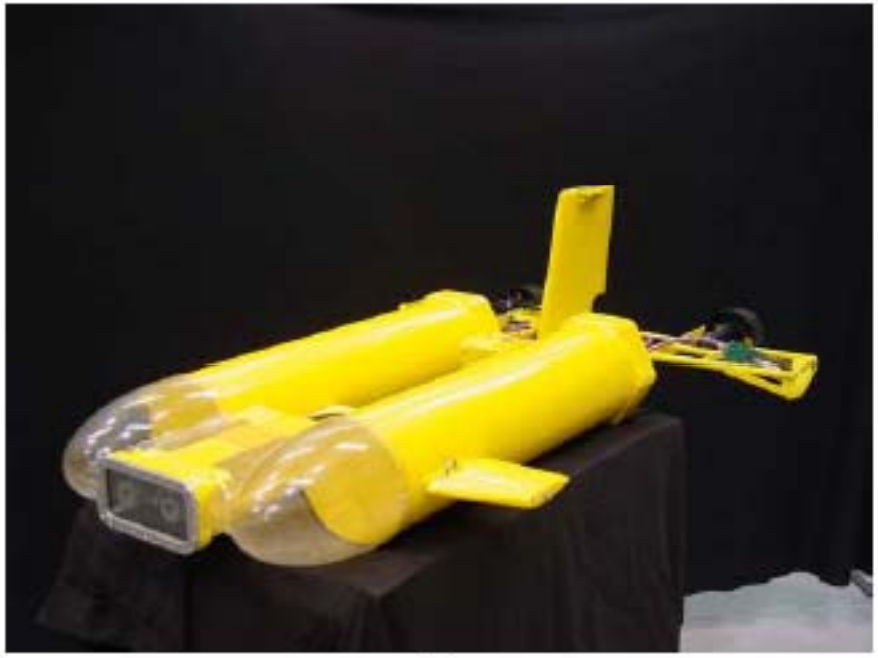
A group of autonomous underwater vehicles (AUV) in underwater



Group photo of the underwater sensor nodes. (a) the static sensor nodes (Aquaecks) and a mobile node (Amour AUV). (b) a mobile node (Starbug AUV).



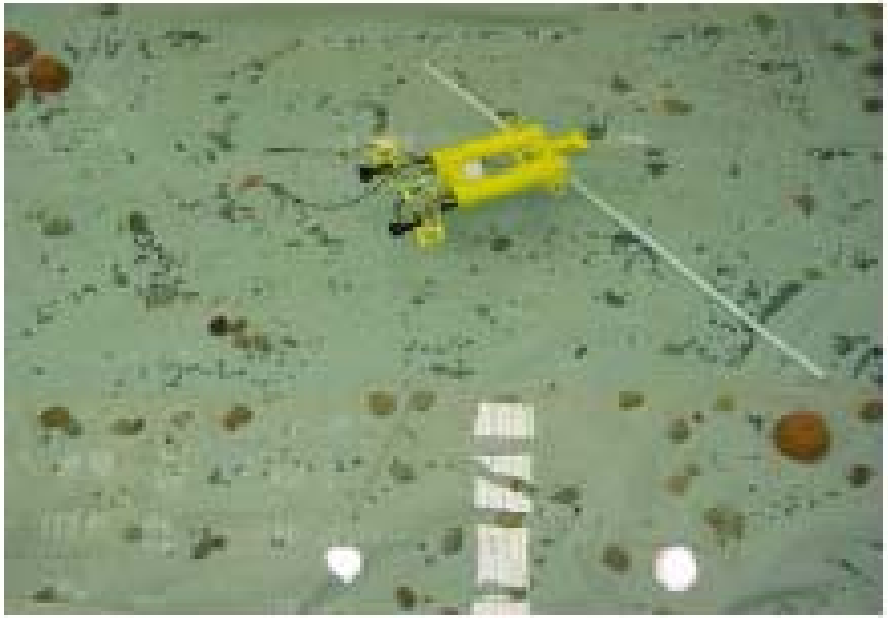
(a)



(b)

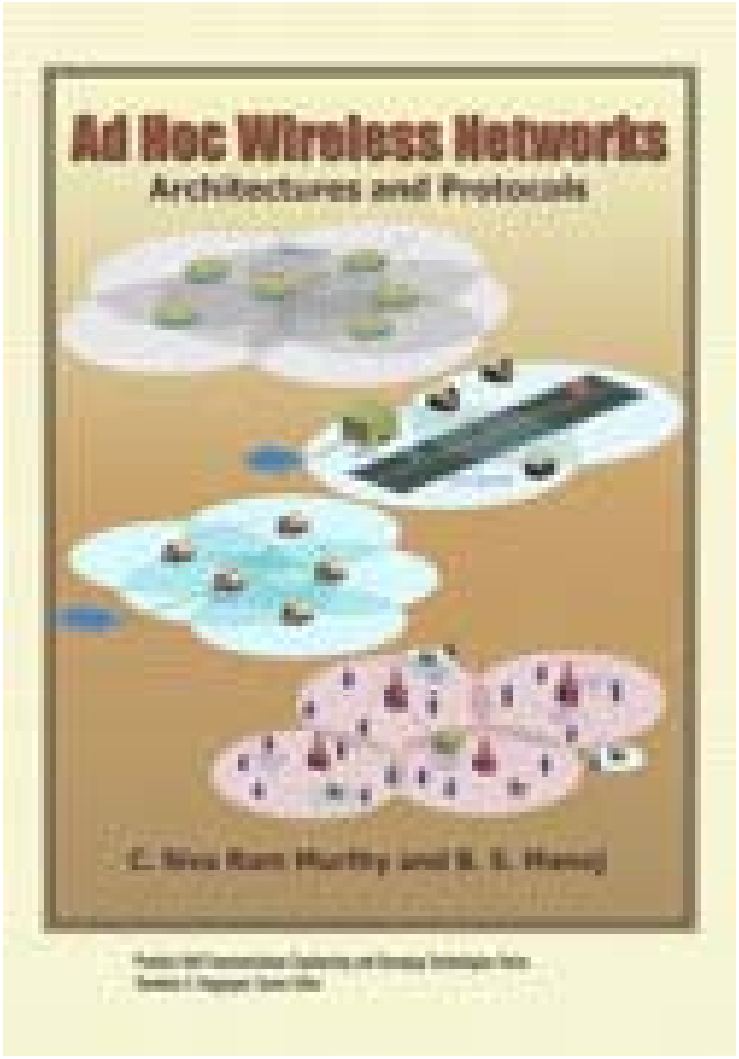
(a) Starbug in Moreton Bay, Brisbane. (b) Starbug in the pool.

(a)

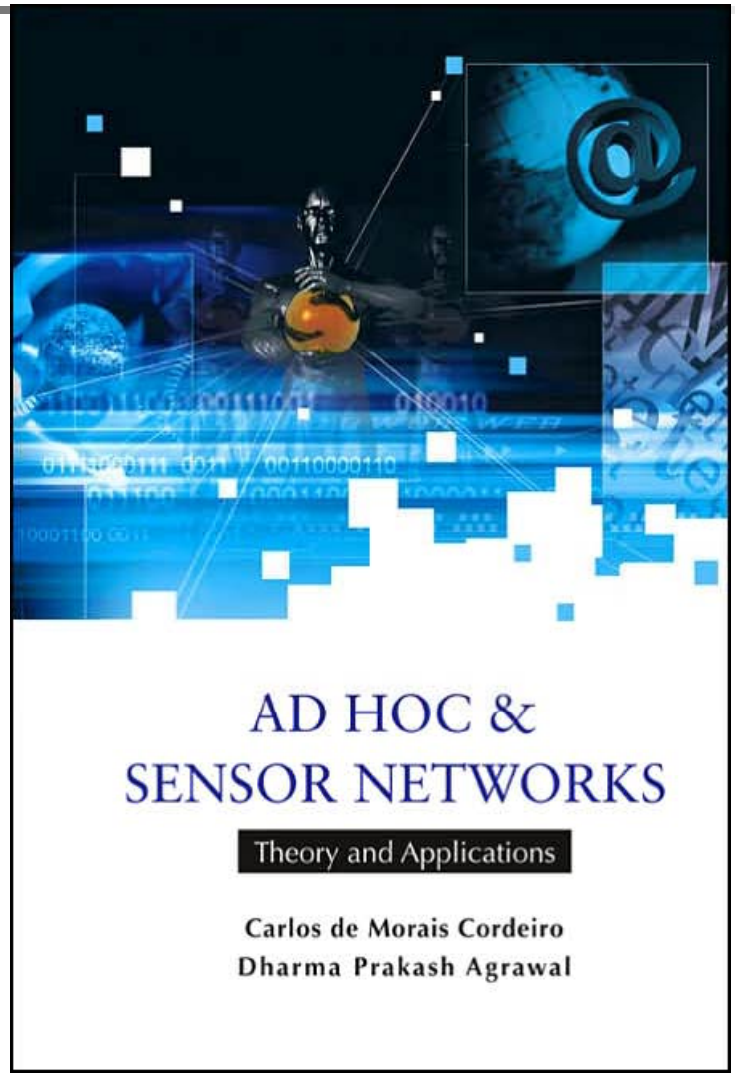


(b)

Ad Hoc Wireless Networks Architectures and Protocols

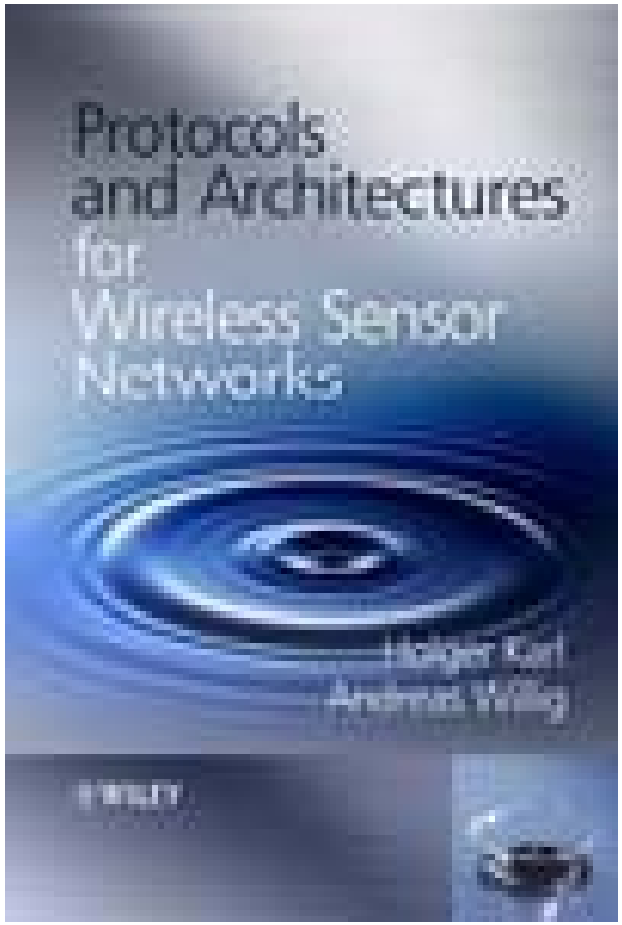


Ad Hoc & Sensor Networks, Theory and Applications

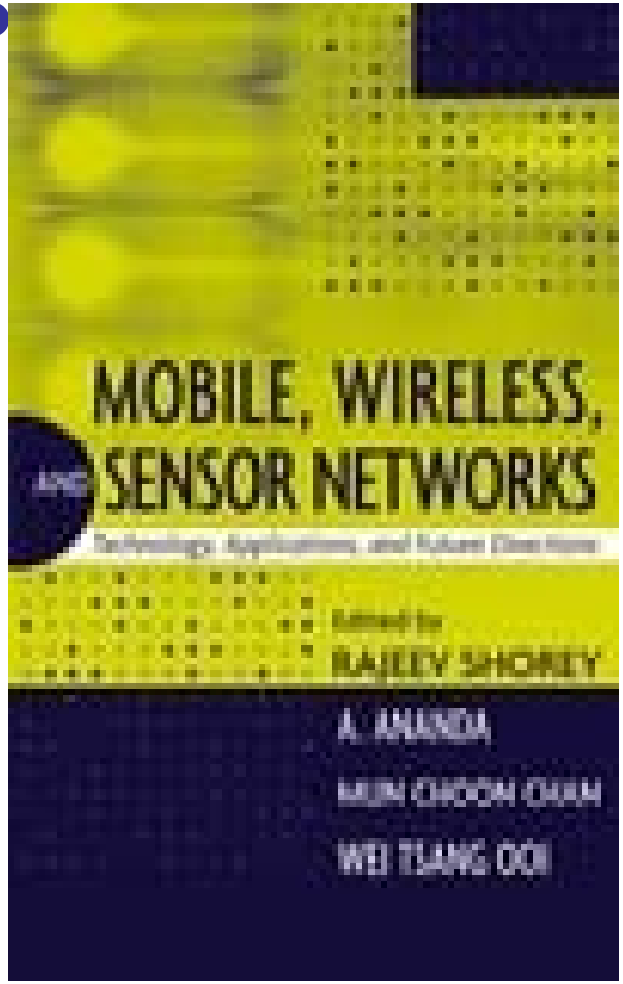


Protocols and Architectures for Wireless Sensor Networks

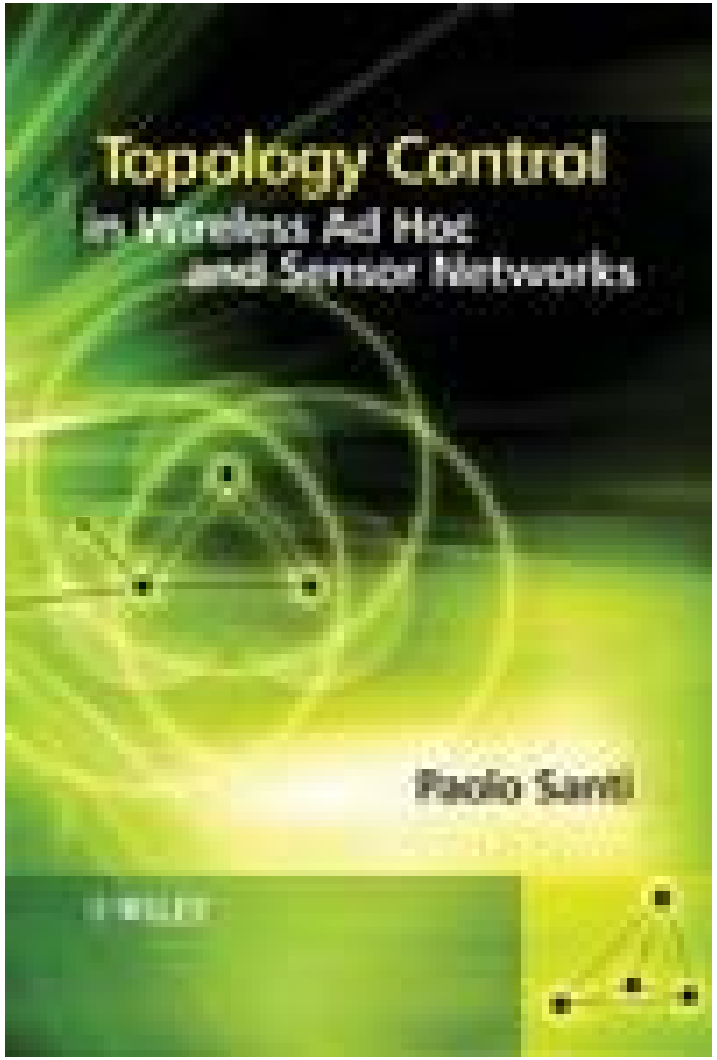
- By **Holger Karl, Andreas Willig**



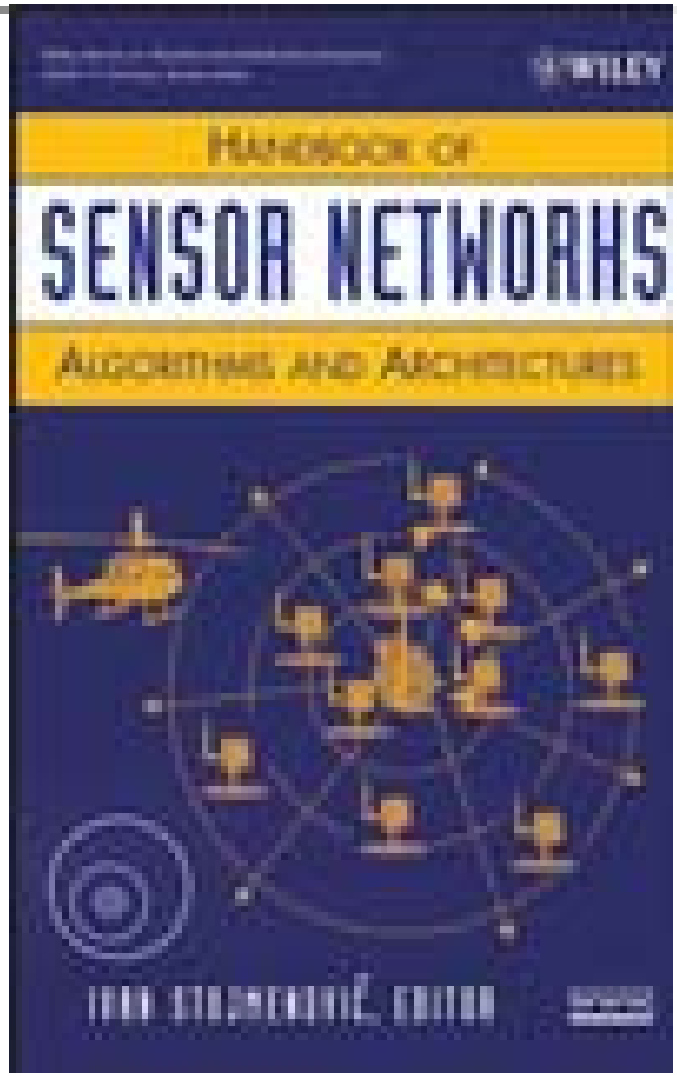
Mobile, Wireless, and Sensor Networks: Technology, Applications, and Future Directions



Topology Control in Wireless Ad Hoc and Sensor Networks

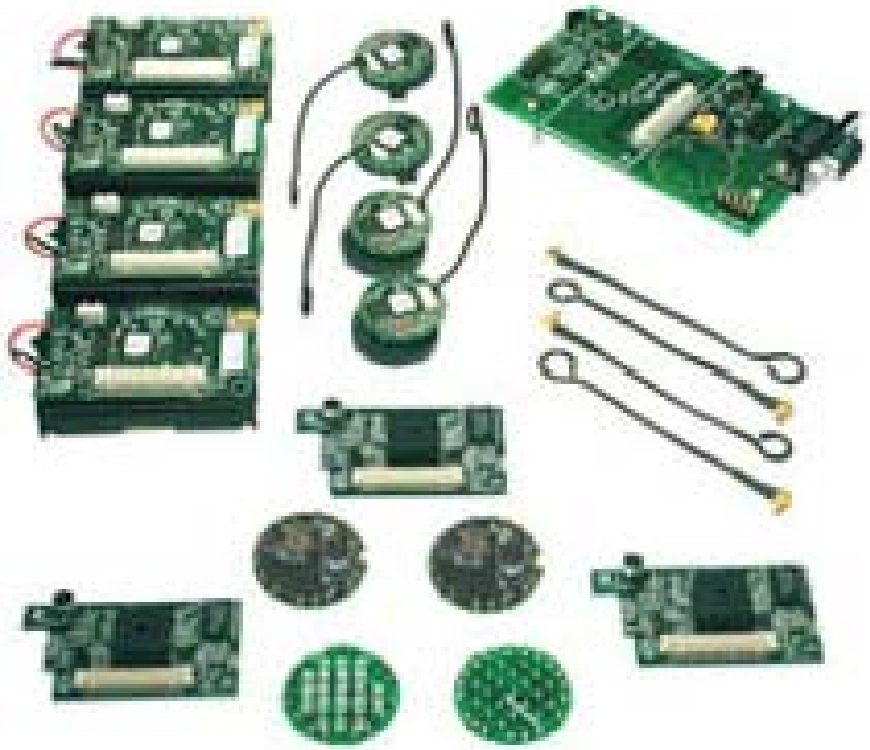


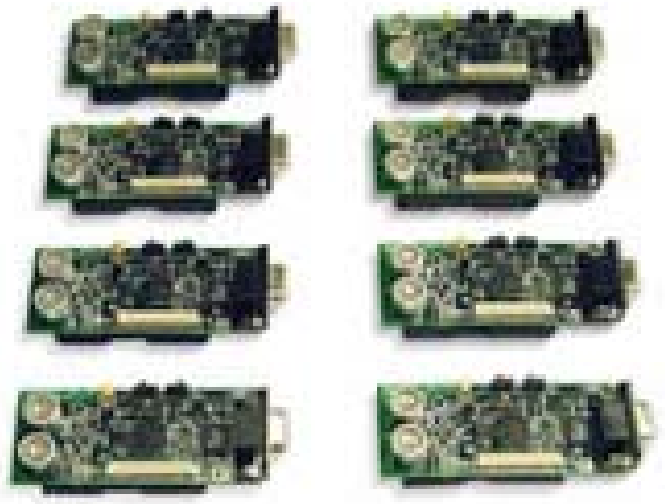
Handbook of Sensor Networks: Algorithms and Architectures

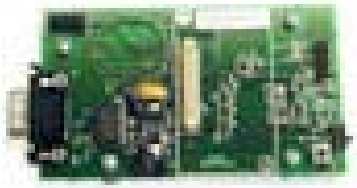


無線感測網路實驗

Mote Kits







學期成績計算方法

- 期中考 (30%)
- 期末考 (30%)
- Homeworks (20%)
- 1 個 實驗 (20 %)