

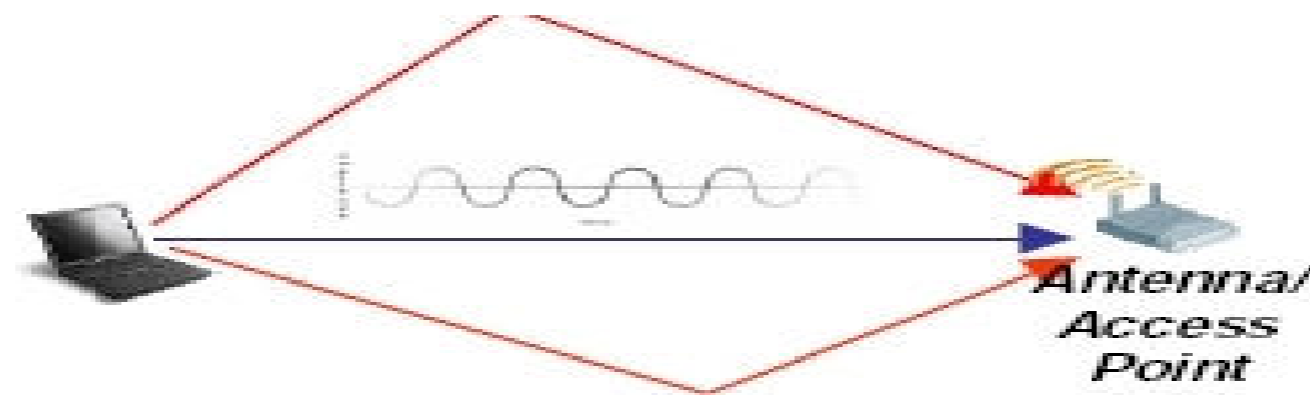
Wireless Cooperative Networking

Key factors for Relay Selection

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Motivation for Cooperative Networking

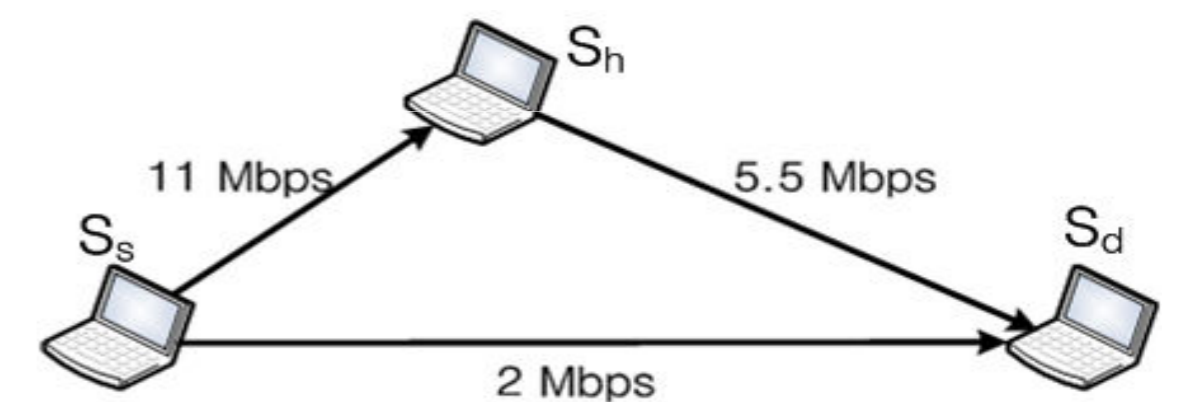
Quality of wireless communications is poor due to fading and multi-path propagation



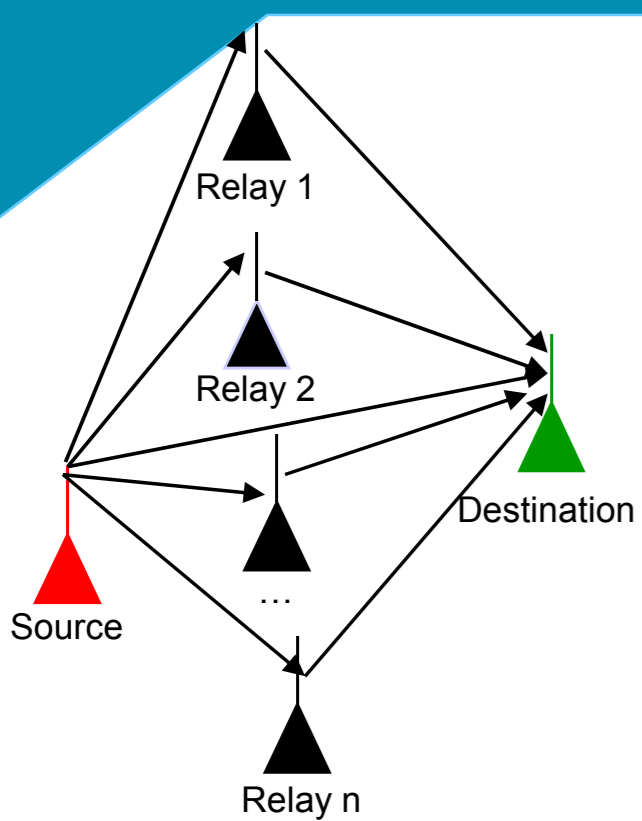
Wireless Diversity: key factor for high throughput and robust transmissions

Cooperative Relaying:

Scheduling over multiple relays to exploit channel variation



Relay Selection



General Questions:

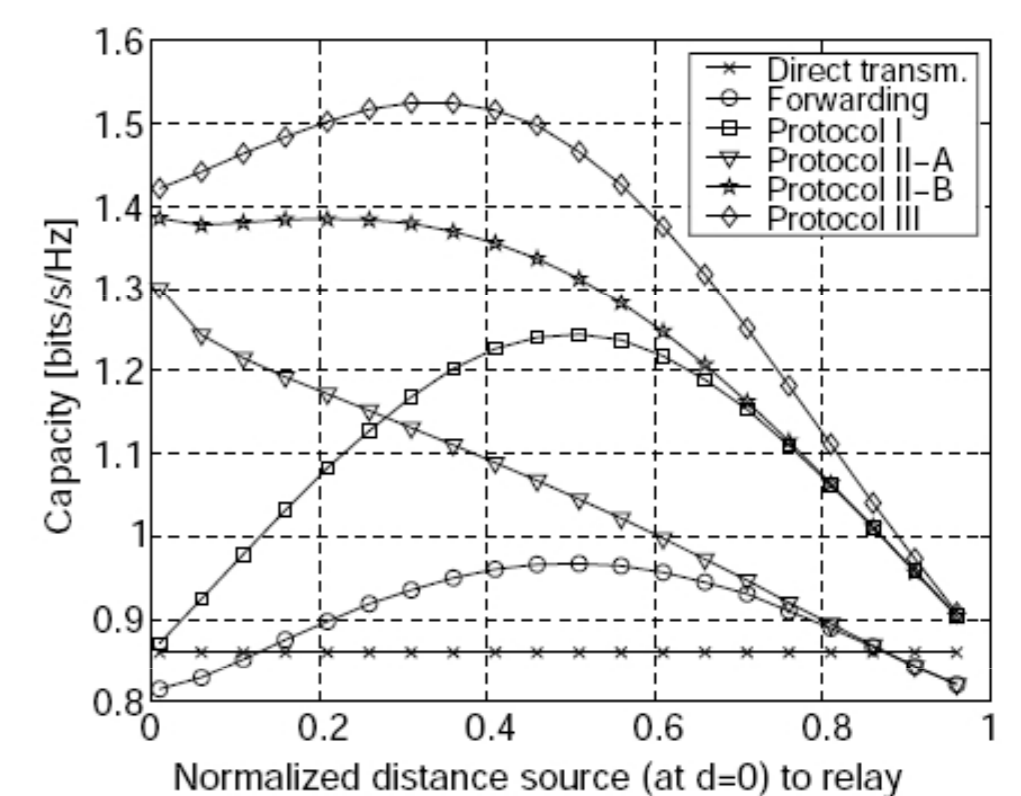
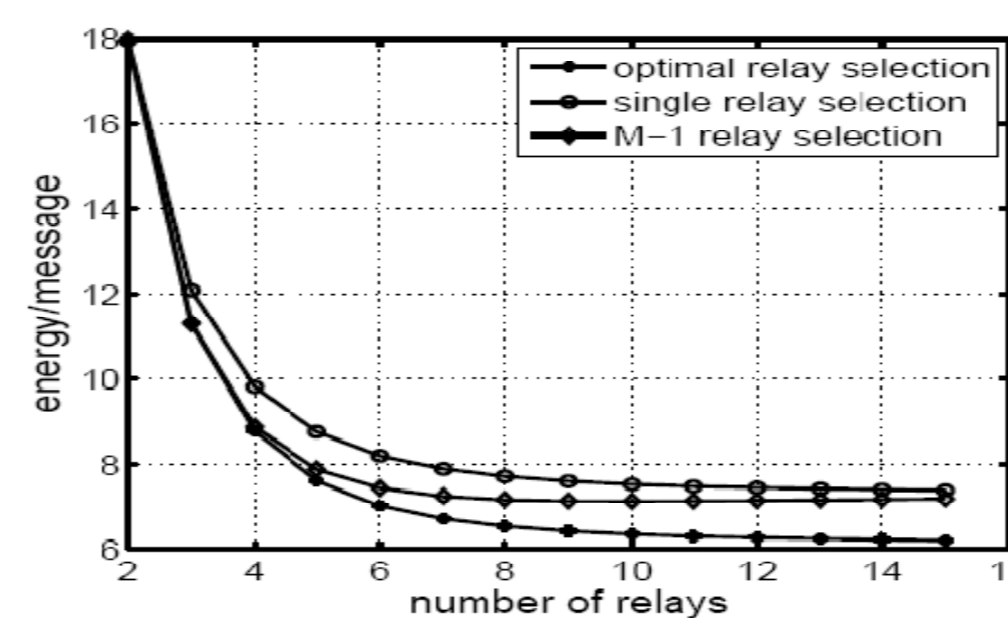
- How many relays to use?
- What parameters to use to select a relay?

State of the Art:

- **Channel based**
 - Opportunistic relaying
 - Source/Destination based relaying
 - Threshold based relaying
- **Channel + Location based**
- **Channel + Capacity based**

Major Limitations

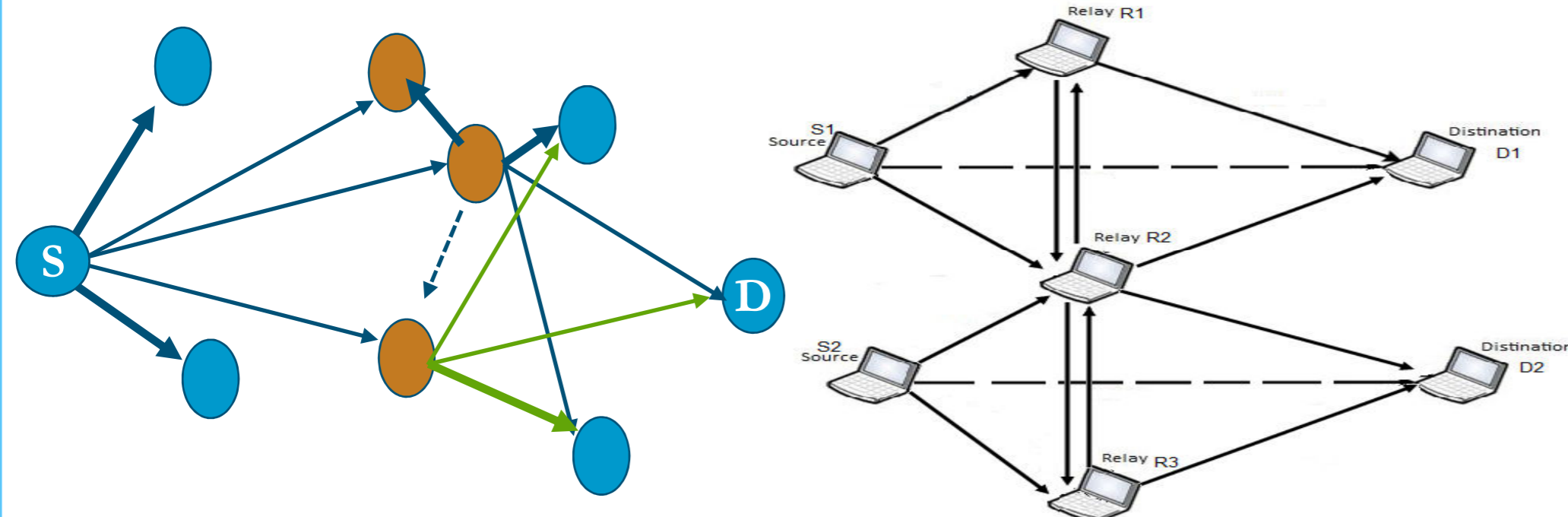
- Selection based on history of channel state
- Introduction of significant overhead
- Mobility of nodes is not considered
- Slow reaction to channel variations
- Increased interference



Proposed Approach

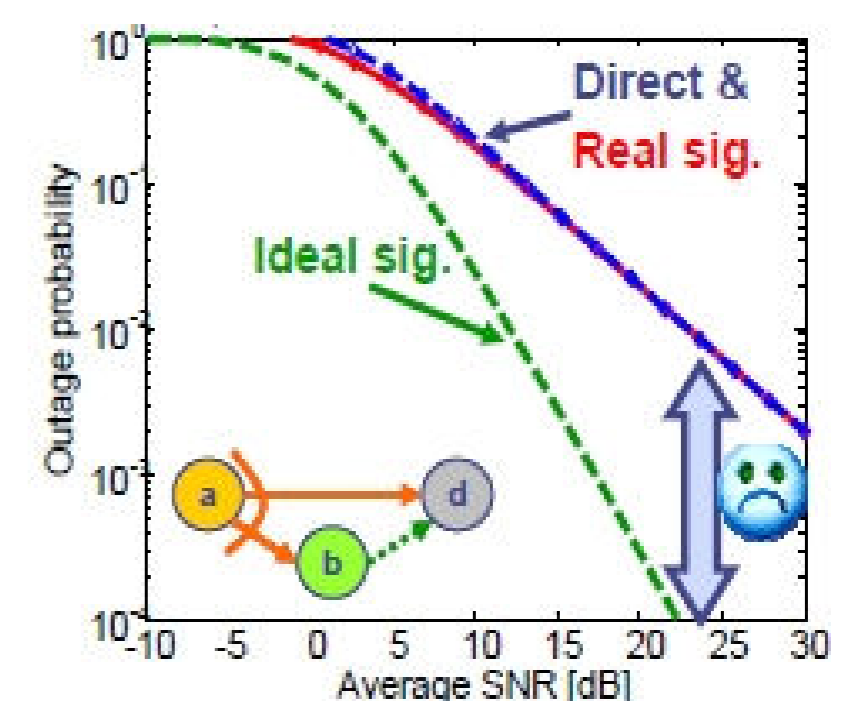
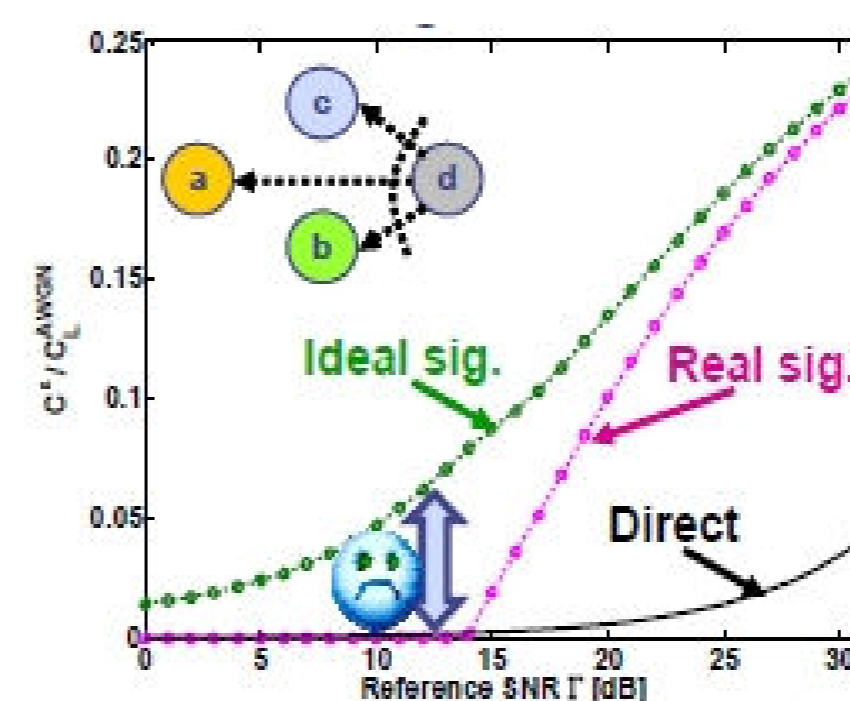
Relaying on Spot Cooperation + Opportunism

- Relaying decisions made by relays only
- Based on current channel/node conditions
- Able to handle node mobility
- Able to handle concurrent transmissions



Expected Outcome

- Reduced number of transmissions
- Reduced overhead and complexity
- Increased network capacity
- Efficient Opportunism/Cooperation balance



[Implementing Cooperative Wireless Networks", S. Valentin, 2008]