Algorithms for Radio Networks

Geometric Routing

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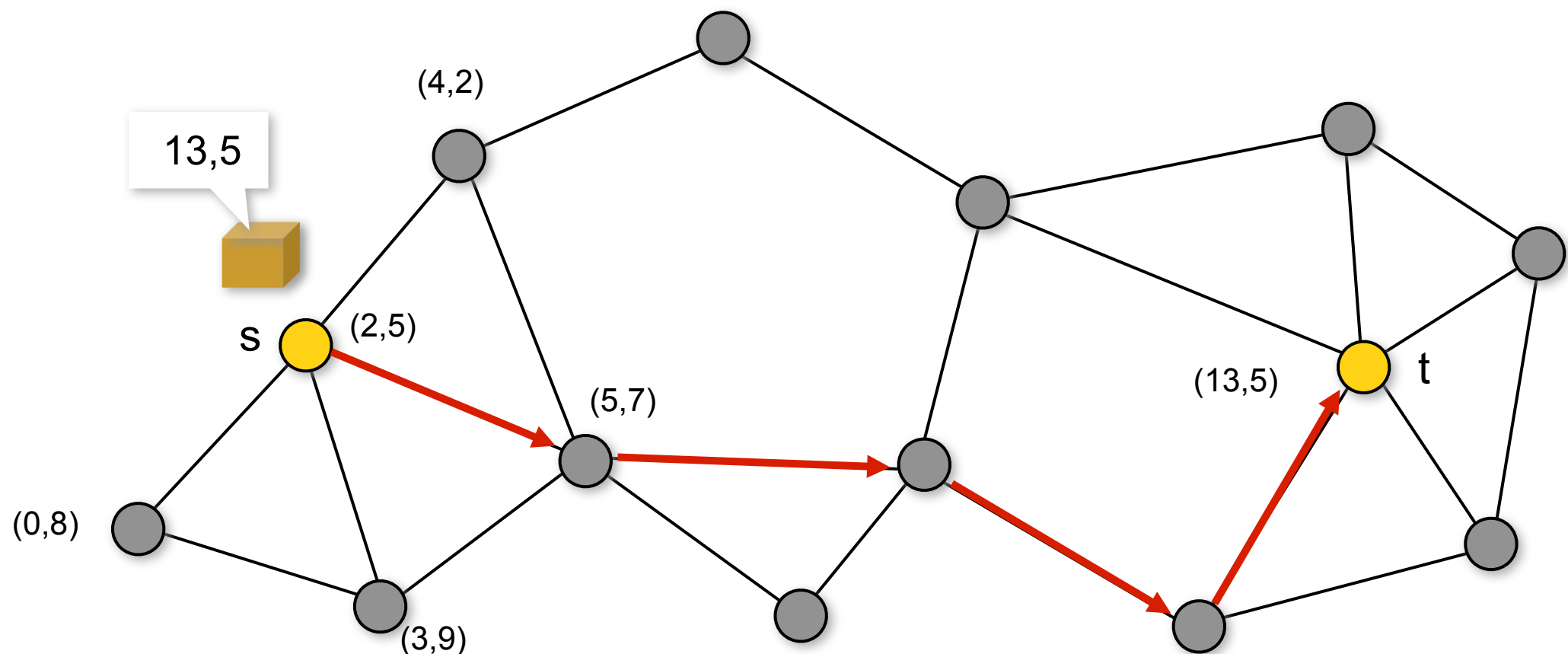
Position Based Routing

- ▸ **Routing target:**
  - geometric position
  - not a network address
- ▸ **Idea**
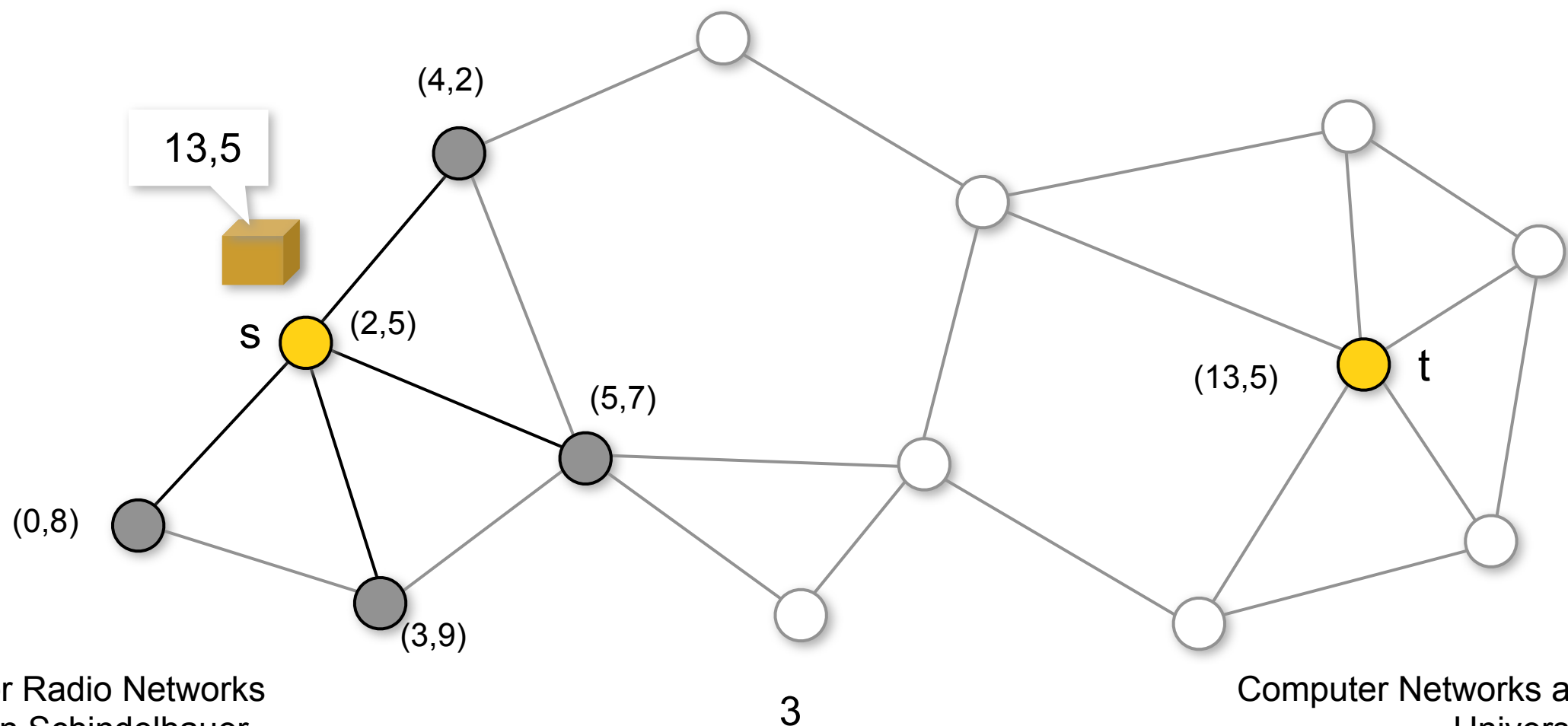 - send message to the neighbor closest to the target node (greedy strategy)

- ▸ **Advantagements**
  - only local decisions
  - no routing tables
  - scalable

Dienstag, 6. Dezember 11
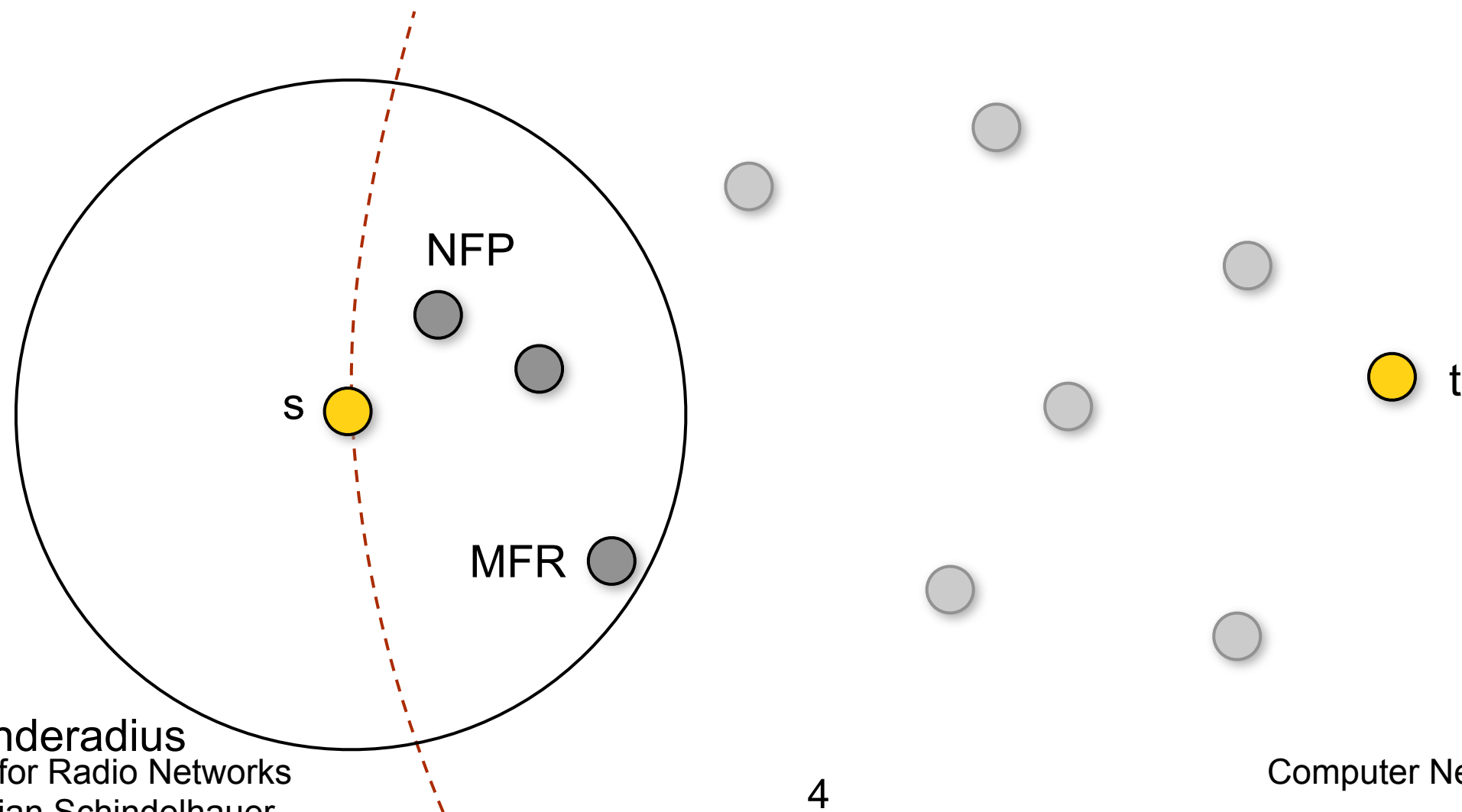
Position Based Routing

▸ **Prerequisites**

- Each node knows its position (e.g. GPS)

- Positions of neighbors are known (beacon messages)

- Target position is known (location service)

First Approaches

▸ **Routing in packet radio networks**

▸ **Greedy strategies:**

- MFR: Most Forwarding within Radius [Takagi, Kleinrock 1984]

- NFP: Nearest with Forwarding Progress [Hou, Li 1986]

NFP

s

MFR

t

Senderadius

PBR in Radio Networks

‣ **Combination of greedy routing and recovery strategy**

‣ **Recovery from local minima (right hand rule)**

• Example: GPSR [Karp, Kung 2000]
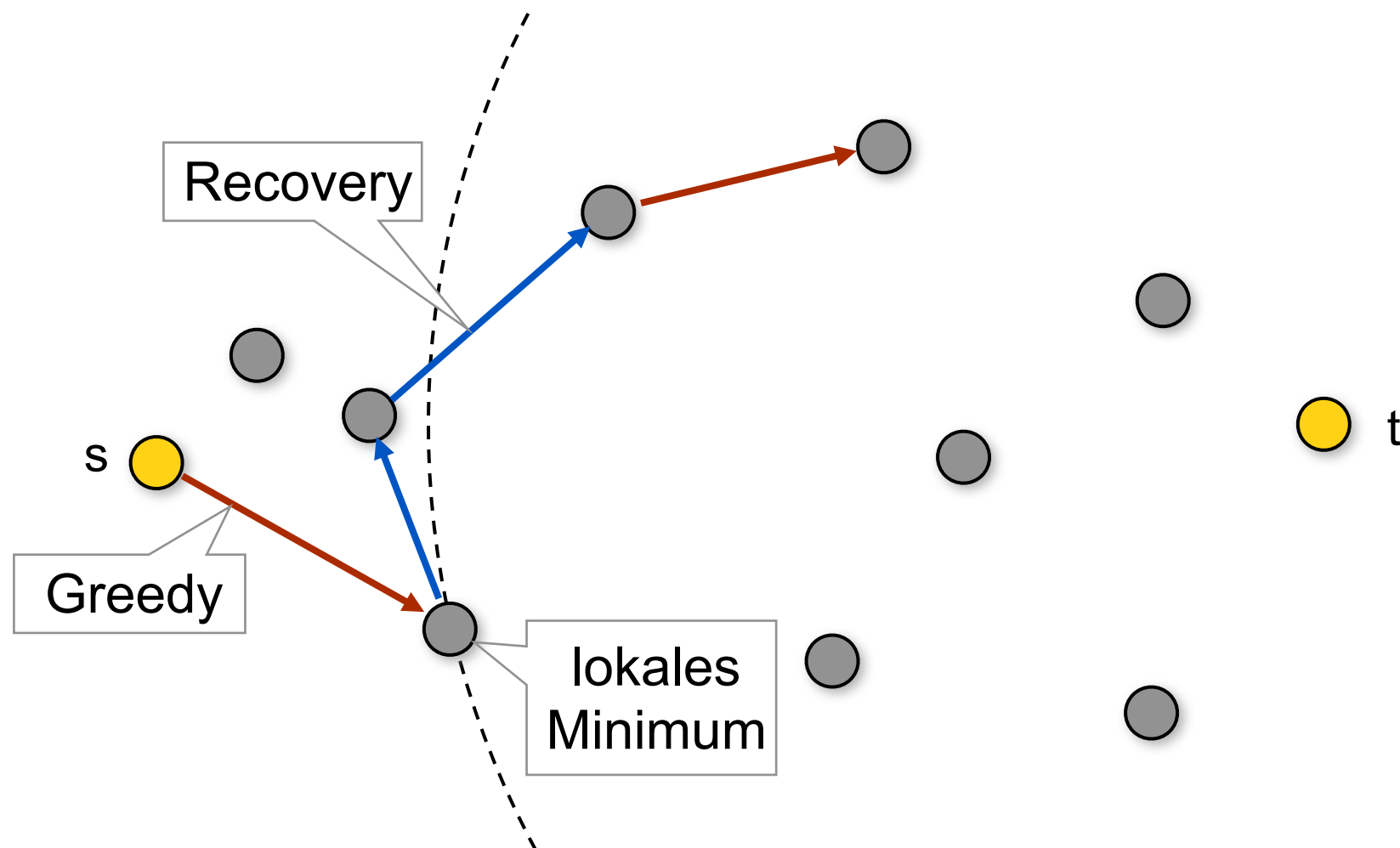
Position Based Routing

▸ **Combination of greedy routing and recovery strategy**

▸ **Recovery from local minima (right hand rule)**
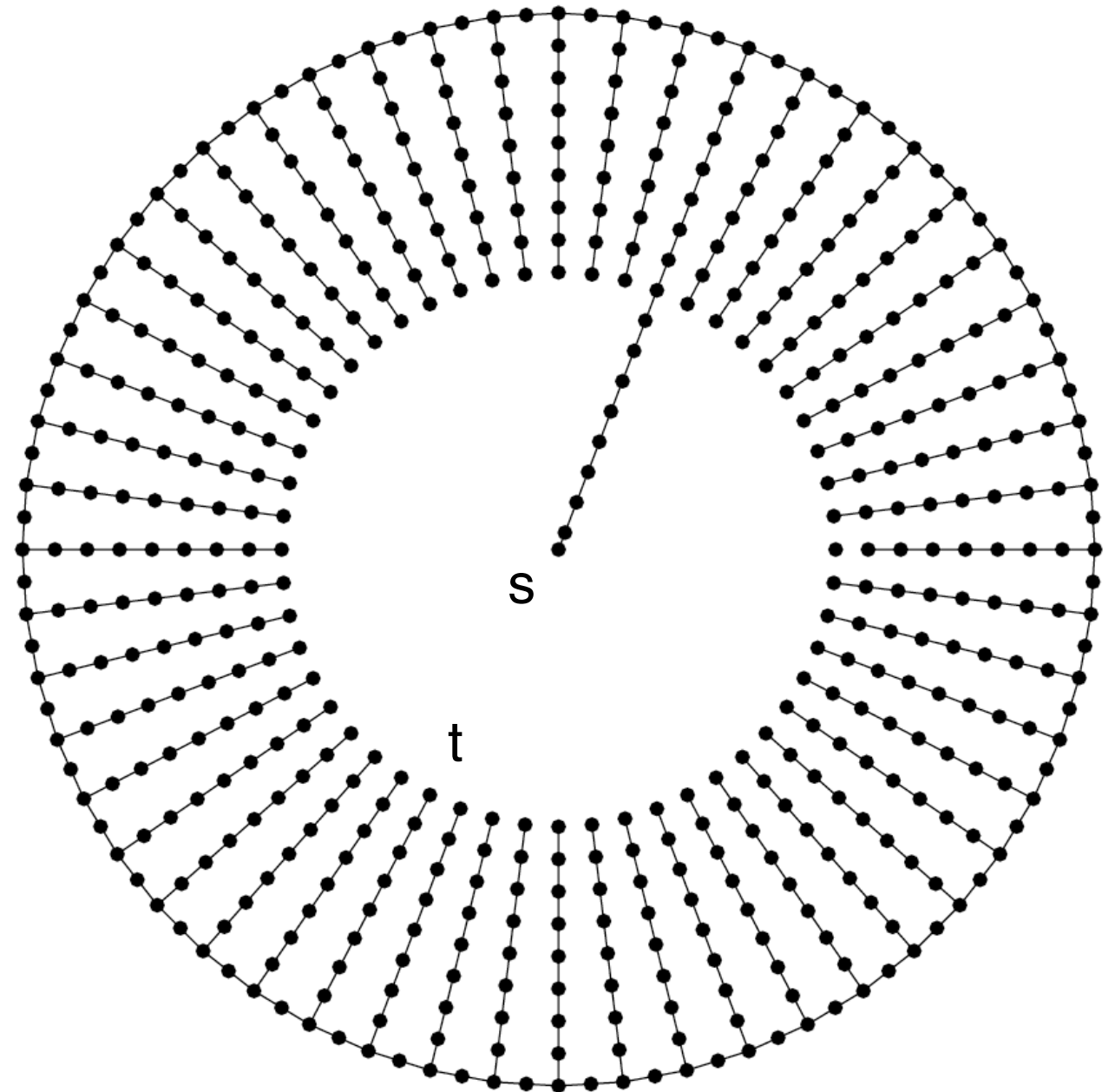
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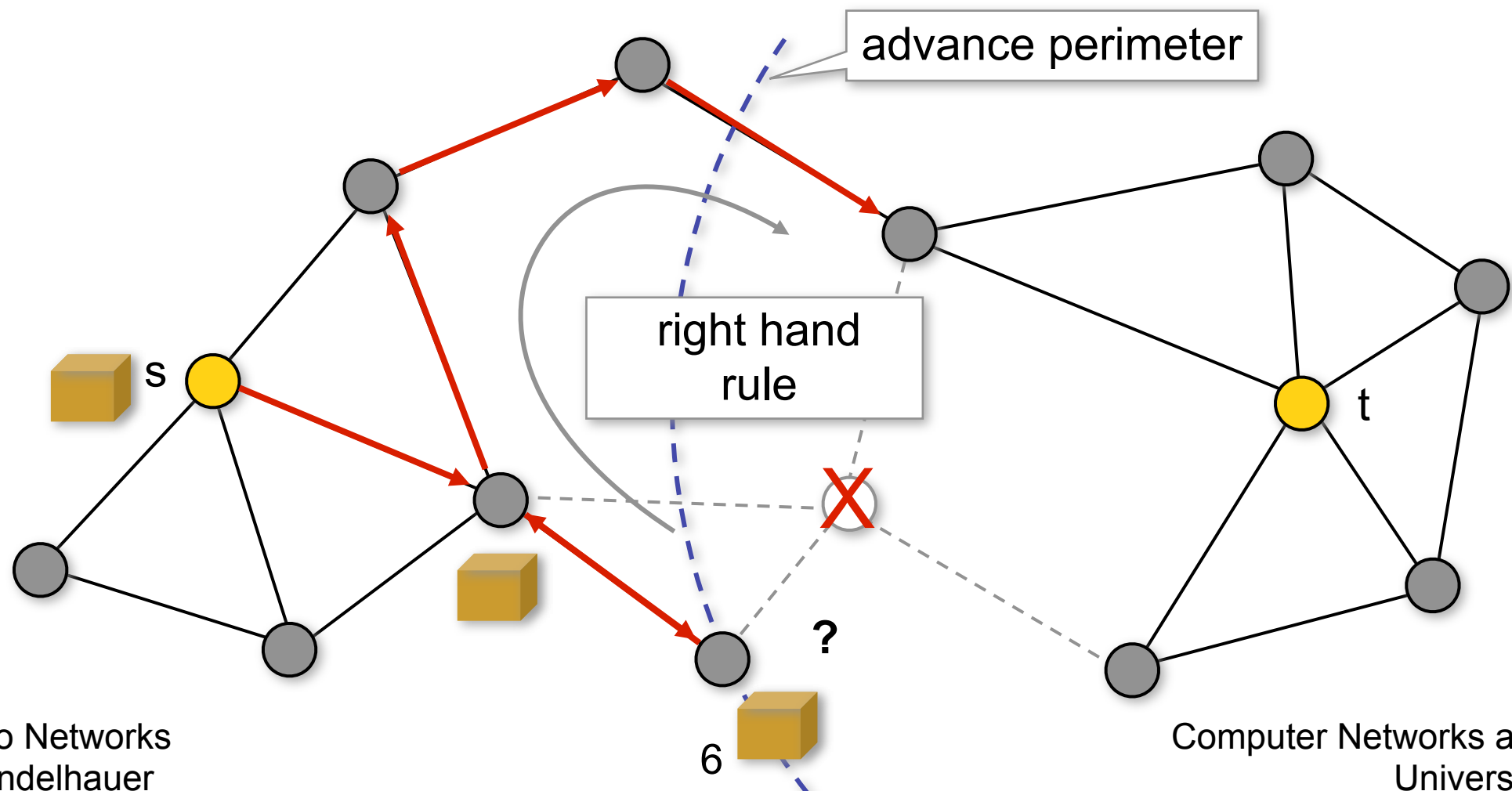
Lower Bound

▸ **Lower bound for position based routing [Kuhn et al. 2002]:**

d = length of shortest path

time = #hops, traffic = #messages

Time: $\Omega(d^2)$

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