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- Dynamic Buffer Status-based control for LTE-A Network with Underlay D2D Communications

  Authors: A Asheralieva, Y Miyanaga

Problem Statement

$$\text{minimize } q_{\max}$$

$$\text{subject to } \mathbf{b} \in \mathbf{B}, \mathbf{c} \in \mathbf{C}, \mathbf{cp} \in \mathbf{P}$$

$$c_n \sum_{m \in \mathbf{N} \setminus \{n\}} (1 - c_m) p_m \sum_{k \in \mathbf{K}} b_n^k b_m^k G_{mn}^k < I_n^{\text{tar}} \quad \forall n \in N$$

$$(1 - c_n) \sum_{m \in \mathbf{N} \setminus \{n\}} p_m \sum_{k \in \mathbf{K}} b_n^k b_m^k G_{mn}^k < I_n^{\text{tar}} \quad \forall n \in N$$

$$q_n + a_n - q_{\max} \leq r_n(\mathbf{b}, \mathbf{c}, \mathbf{p}) \leq q_n + a_n \quad \forall n \in N$$

- Solved using continuous relaxation and then applying ADMM

- Heterogeneous Cellular Network With Energy Harvesting-based D2D Communication

Authors: Howard H. Yang, Jemin Lee and Tony Q. S. Quek

System Model, Goal, & Contribution

- K-tier Heterogeneous network with RF energy harvesting nodes
- Each node has infinite battery
- Each node can act as an UER iff it has $P_u = NC$ energy in battery.
- A node receive from AP with prob p_{rc}
- Goals: to find a UER and transmission mode selection scheme
- Solution:
  - Find the outage probability in for a given distance with AP and UER
  - Minimize outage probability w.r.t. UER loaction
  - Characterize FUR and select best UER in FUR

- Capacity of Wireless Networks with Social Characteristics

  Authors: L Fu, W Huang, X Gan, F Yang and X Wang

System Model and Goal

- Network with side length $= 1$
- Communication model: Protocol Model
- $Pr\{i \to j\} = \frac{1}{G_1 Rank_i^{\alpha}(j)}$
- For Multicasting: $Pr\{K_i = k\} = \frac{1}{G_2 k^{\beta}}$
- Goal: Find Unicast and Multicast throughput.
- For Unicast $\lambda_u(n) = O\left(\frac{1}{\mathcal{D}\sqrt{n}}\right)$
- For Multicast: assume independent and uniform selection of destination.

Results

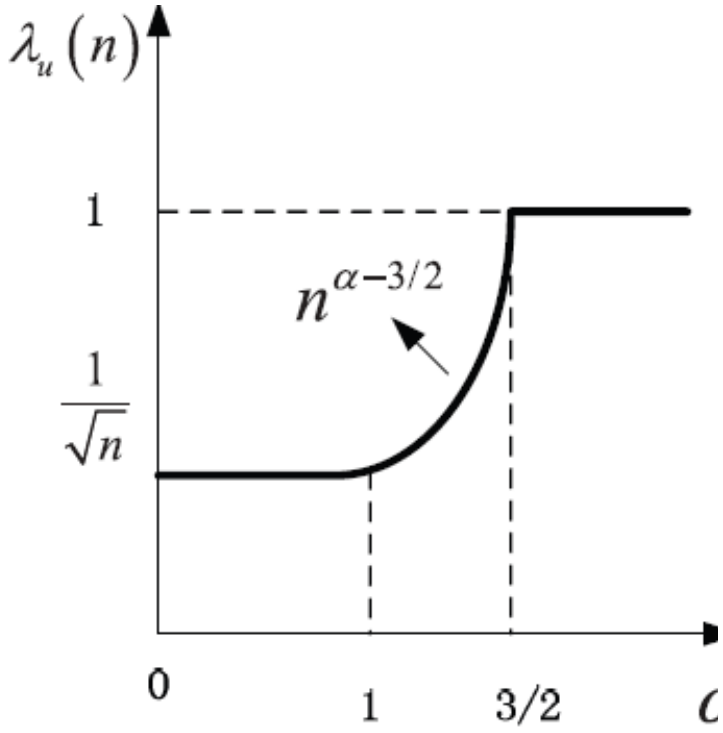


Figure: Unicast

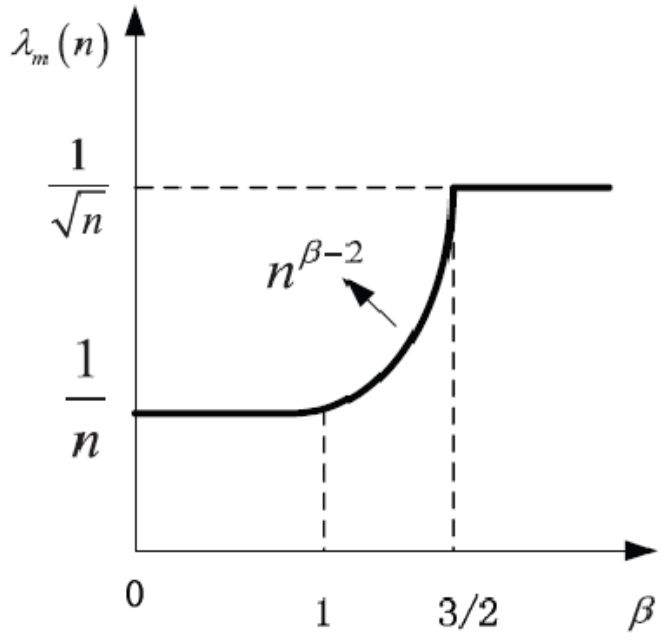
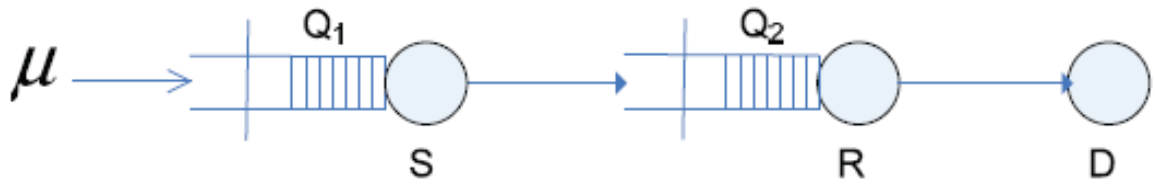


Figure: Multicast

- Optimal Resource Allocation for Buffer-Aided Relaying with Statistical QoS Constraint

Authors: K. T. Phan, T. Le-Ngoc, and Long Bao Le

System Model,Goal & Contributions



- S-R and R-D channels are independent
- Problem statement

$$\max_{\mu,\phi(t)\in\{0,1\}} \mu$$

$$\text{s.t. } \Pr\{Q > Q_{\max}\} \leq \xi_Q$$

  where, $Q = Q_1 + Q_2$
- Goal: Find link activation policy and optimal power control policy.