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- Paradoxes in Semi-Dynamic Evolutionary Power Control Game : When Intuition Fools You!

Authors: Majed Haddad[1], Eitan Altman[1], Dieter Fiems[2], and Julien Gaillard[1]

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- Modeled as ‘Hawk and Dove’ game,
- Sparse network with large population of MSs,
- At most 2 MSs are involved in interference,
- Two type of terminals : Hawks(aggressive) and Doves(peaceful),
- Actions are state-independent (semi-dynamic),
- A mobile user sticks to the choice made in beginning : fixed T.
- Results :
    - Analyze the existence of equilibria and characterize it.
    - Identifies various surprising paradoxes.

- Robust Uplink Communications over Fading Channels with Variable Backhaul Connectivity

Authors: Roy Karasik[1], Osvaldo Simeone[2], and Shlomo Shamai (Shitz)[1]

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System Model

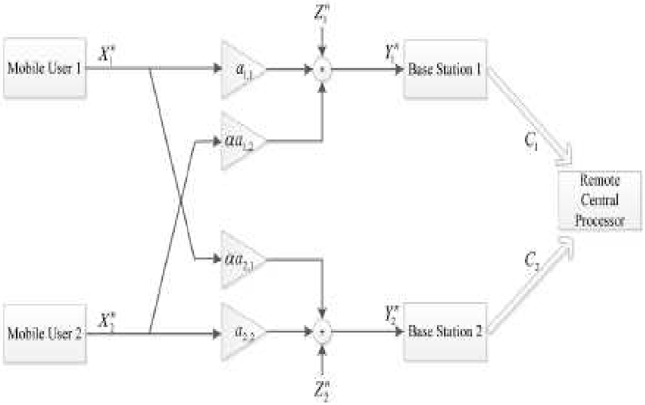

Figure : Two-cell Gaussian cellular uplink channel with variable capacity backhaul links.

- System model,
  - Two Scenarios for first hop : (i) Constant Channel gain (ii) quasi-static fading,
  - Second hop : Orthogonal finite-capacity links with random fluctuations,
  - Only receive-side channel state information,
  - BSs doesn't know the MSs codebook,
  - BSs Act as 'soft relays' : compress and forward,
- Contributions,
  - Upper and lower bound on the average achievable throughput are found
  - Lower bounds : strategies that combine the broadcast coding approach and layered distributed compression techniques,
  - Upper bound : All nodes know the CSI.

- Dynamic Partial Cooperative MIMO System for Delay-Sensitive Applications with Limited Backhaul Capacity

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System Model

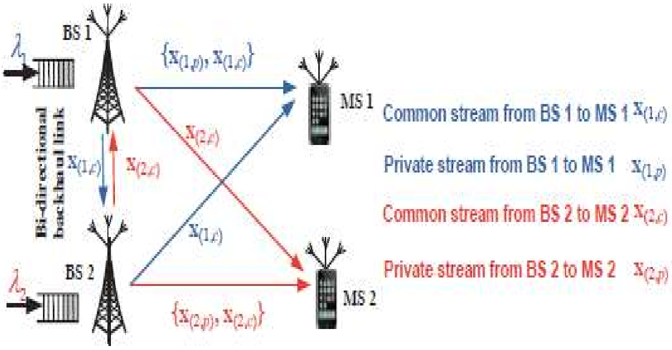

Figure : System Model for K=2

- Motivation : With backhaul capacity constraint full MIMO cooperation may not be optimal.
- Contribution :
  - Propose a flexible downlink partial cooperative MIMO (Pco - MIMO) scheme.
  - Based on Pco-MIMO they find the delay-optimal transmit power and rate allocation policy (with imperfect CSIT and QSI).
- Problem is formulated as CPOMDP

- Multiuser Diversity in Interfering Broadcast Channels: Achievable Degrees of Freedom and User Scaling Law

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- Motivation : multiuser diversity can also be exploited by opportunistic user selection for minimizing interference.
- Two Cases
  - K- SIMO IBC : Transmitter has a single antenna and serve a single user in its user group and each user has receive antennas less than K.
  - MIMO IBC : Transmitter with multiple antennas serve multiple users.
- non-zero DoF (d)

$$d = d_1 - d_2 \tag{1}$$

where, d_1/d_2 : DoF gain/loss term, respectively.

- Questions,
  1. What is the feasible and optimal combination of (d1, d2) for the target DoF d?
  2. What is the sufficient number of users for the target DoF achieving strategy ?
  3. How the multiuser dimensions can be optimally exploited for the target DoF in the IBC?
- Answers
  - For K-transmitter SIMO IBC
    - For the target DoF $d \in [0, 1]$ and $d > 1$ the optimal target DoF achieving strategies (d_1^*, d_2^*) are $(1, 1 - d)$ and $(d, 0)$.
    - DoF gain term d_1 and d_2 can be achieved if the number of users scales in terms of transmit power P as $N \propto e^{P(d_1 - 1)}$ and $N \propto e^{P(1-d_2)(K-N_r)}$

- Spatial Stochastic Models and Metrics for the Structure of Base Stations in Cellular Networks : Anjin Guo and Martin Haenggi
- Generalised Pre-Coding Aided Spatial Modulation: Rong Zhang, Lie-Liang Yang, and Lajos Hanzo.
- On the Performance of Diagonal Lattice Space-Time Codes: Walid Abediseid and Mohamed-Slim Alouini.
- Spectrum Sensing Using Correlated Receiving Multiple Antennas in Cognitive Radios : Saeid Sedighi, Abbas Taherpour, and Josep Sala.