IEEE Transactions on Signal Processing

Geethu Joseph

SPC Lab, IISc

July 20, 2013

Joint Access Point Selection and Power Allocation for Uplink Wireless Networks

Mingyi Hong, Alfredo Garcia, Jorge Barrera, and Stephen G. Wilson

- Uplink resource allocation problem in a multi-carrier wireless network with multiple access points
- A game theoretic formulation of the joint power control and AP selection problem, to optimize transmission rates.
- Characterizations of the Nash Equilibrium of the proposed non-cooperative game.
- A distributed algorithm named Joint Access Point Selection and Power Allocation(JASPA) is proposed

Compressed Sensing and Affine Rank Minimization Under Restricted Isometry

T. Tony Cai and Anru Zhang

- For Compressed sensing, $\delta_k^A + \theta_{k,k}^A < 1$ guarantees the exact recovery of all k sparse vectors in the noiseless case through the constrained $l_1$minimization.
- For any $\epsilon > 0$, $\delta_k^A + \theta_k^A < 1 + \epsilon$ is not sufficient for the recovery.
- Similarly, for affine rank minimization, sufficient condition for recovery via the constrained nuclear norm minimization is $\delta_r^M + \theta_{r,r}^M < 1$.
- Result is extended to stable recovery in noisy case.
- Strictly weaker than other sufficient conditions introduced in literature.

Weighted Max-Min Resource Allocation for Frequency Selective Channels

E. Zehavi, A. Leshem, R. Levanda, and Z. Han

- Weighted max-min rate allocation technique using joint FDM/TDM subchannel allocation under a power spectral density (PSD) mask constraint.

$$R_{max-min} = \max_{\boldsymbol{\alpha}_1,\ldots,\boldsymbol{\alpha}_N} \min_{1\leq n\leq N} \gamma_n R_n(\boldsymbol{\alpha}_n)$$

- Solved using a linear programming technique.
- There is always an optimal solution where at most $N-1$ frequencies are shared using TDM.
- Extented to voice and data rate allocation

- Each receiver knows its channels perfectly and feeds back this information using a limited number of bits to others.
- Sufficient condition on the feedback bit rate scaling to achieve the same degrees of freedom attainable with the perfect and global CSITR.
- A slower scaling of feedback rate for any one user leads to fewer degrees of freedom for that user alone.
- Under random vector quantization, the above condition is also necessary

Other Papers

- **Estimation in Phase-Shift and Forward Wireless Sensor Networks**
  - Feng Jiang, Jie Chen and A. Lee Swindlehurst
  - Two algorithms for finding the sensor phase shifts that minimize the variance of the estimated parameter
- **Comparison of Distributed Beamforming Algorithms for MIMO Interference Networks**
  - David A. Schmidt, Changxin Shi, Randall A. Berry, Michael L. Honig and Wolfgang Utschick
  - Max-SINR (maximum degrees of freedom), Adaptively weighted MMSE (different points), Interference pricing with incremental SNR (deactivate user and sum rate)