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Blind Interference Alignment for Cellular Networks

- Authors: M. Morales-Cespedes, J. Plata-Chaves, D. Toumpakaris, S. A. Jafar, A. G. Armada
- Blind IA (BIA) for MU-MISO BC DoF $= \frac{N_t K_{\text{tot}}}{N_t + K_{\text{tot}} - 1}$
  - Long super symbols
  - Antennas with reconfigurable radiation patterns
  - Single BS
- This paper: network BIA for cellular system with *partial connectivity*
  - UEs close to BS only see one BS: *private*
  - UEs at cell edge see multiple BS: *shared*
- Highlights of proposed scheme
  - Each BS sends part of the data; no need to share all data with all BSs
  - No need for CSIT
  - Shorter super symbol duration
  - Symmetric case: DoF optimal

Efficient Coordinated Recovery of Sparse Channels in Massive MIMOs

- Authors: M. Masood, L. H. Afify, and T. Y. Al-Naffouri
- Multiple antenna BS, single antenna UEs
- Based on a "support agnostic Bayesian matching pursuit" algo proposed previously by the authors
- Exploit joint sparsity of channels
- Requires communication between neighboring antennas
- One version: only integer message exchanges
- Competing paper to Ranjitha's MIMO-OFDM work

Computable Performance Bounds on Sparse Recovery

- Authors: G. Tang and A. Nehorai
- Use ℓ_∞ norm of the error as the performance metric for sparse signal recovery
  - If the min. abs. nonzero entry of sparse vector is ϵ, $\|\text{error}\|_\infty < \epsilon/2$ guarantees exact support recovery
- Propose "quality measure" for sensing matrix (based on ℓ_∞ norm)
- Polynomial-time algos to verify whether sensing matrices satisfy the quality measure
- Upper bounds on the ℓ_∞ norm based on quality measure, for BPDN, Dantzig selector, and LASSO
- Easy read, well written paper

Pattern-Coupled Sparse Bayesian Learning for Recovery of Block-Sparse Signals

- Authors: J. Fang, Y. Shen, H. Li, and P. Wang
- Consider cluster sparse signal when the block partitioning structure is unknown
- New pattern coupled hyperparameter model proposed
  - Sparsity of each coeff. controlled by its own hyperparameter as well as that of its neighbors
  - Superior performance compared to existing methods: simulations

Energy Detection Based Spectrum Sensing for Cognitive Radios Over Time-Frequency Doubly Selective Fading Channels

- Authors: B. Li, M. Sun, X. Li, A. Nallanathan, and C. Zhao
- Time-frequency selective channel; primary occupancy: both unknown
- Modeled as discrete state process
- Jointly estimated in a Bayesian framework using energy meas.
- Particle filtering based approach; recursive estimation
- Interesting that it is still possible to publish work on CR spectrum sensing!

Decentralized Eigenvalue Algorithms for Distributed Signal Detection in Wireless Networks

- Authors: F. Penna and S. Stanczak
- Goal: computation of largest Eval of a covariance matrix over a network
- Analyze 2 algos: decentralized power method (DPM) and decentralized Lanczos algorithm (DLA)
- Based on sequential average consensus steps (for matrix-vector & vector inner products)
- Application: spectrum sensing in CR networks
  - Show that Eval-based tests can be implemented in a distributed fashion

Conjugate Gradient Iterative Hard Thresholding: Observed Noise Stability for Compressed Sensing

- Authors: J. D. Blanchard, J. Tanner, and K. Wei
- Title says it all: analysis of CGIHT for CS
- CGIHT: low per iteration cost line search + fast convergence
- Show that CGIHT is
  - The fastest IHT algorithm
  - Robust to additive noise well beyond the theoretical worst case guarantees
  - Particularly good in the MMV setup