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Completing Low-Rank Matrices with Corrupted Samples From Few Coefficients in General Basis

H. Zhang, Z. Lin and C. Zhang

$$\min_{L,S} \text{rank}(L) + \lambda ||S||_{2,1},$$

$$\text{s.t.} \quad < M, \omega_{i,j} > =< L + S, \omega_{i,j} >, \qquad (i,j) \in \mathcal{K}_{obs}$$

$\{\omega_{i,j}\}_{i,j=1}^{n}$ is a set of orthonormal bases s.t.

$$\text{Span}\ \{\omega_{i,j}, i = 1, \ldots, m\} = \ \text{Span}\ \{e_i e_j^*, i = 1, \ldots, m\} \qquad \text{for all } j$$

- Relaxed problem by replacing the rank with Nuclear norm
- Contributions:
  1. Exact recovery guarantees if $\text{rank}(L_0) < O(\frac{n}{\log^3 n})$ and number of corruptions$< O(\frac{n}{\log^3 n})$
  2. provide the algorithm
  3. $\lambda = \frac{1}{\sqrt{\log n}}$

A Geometric Analysis of the AWGN Channel With a $(\sigma, \rho)-$ Power Constraint

V. Jog and V. Anantharam

- (σ, ρ)*constraint*

$$\sum_{j=k=1}^{\ell} x_j^2 \leq \sigma + (\ell - K)\rho \qquad \text{for all } 0 \leq k < \ell \leq n$$

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$$S_n(\sigma, \rho) = \{x^n \in R^n : x^n \text{ satisfies } (\sigma, \rho) \text{ constraint } \}$$

- Get the upper and lower bound on the capacity by analyzing the volume of $S_n(\sigma, \rho)$
- $\sigma = 0$, AWGN with peak power constraint

Optimal Offline and Competitive Online Strategies for Transmitter-Receiver Energy Harvestin

S. Satpathi, R. Nagda and R. Vaze

- Transmission time completion with infinite/finite battery
- Causal and non-causal EH processes
- Coordinated operation with spatially independent EH process
- Offline case: first solve for single energy arrival and then extend
- Online case (Infinite battery): Store and Dump with transmit power such determined assuming that no more energy is going to arrive in future
- Online Case (finite battery): Store and Dump with different threshold

Optimality of Treating Interference as Noise: A Combinatorial Perspective

X. Yi and G. Caire

- Consider single antenna Gaussian interference channel
- Perfect CSIR and Tx knows channels gain
- Geng et al. showed the GDoF optimality of treating interference as noise
  - Condition

    Desired signal strength $\geq \max\{$ interference in $+$ interference out $\}$

  - TINA region is characterized through with $(K-1)!$ GDoF constraints.
- Contributions
  - Show that TIN power control problem can be posed as assignment problem.
  - TIN optimality under different conditions. Thus, increase the GDoF region.
  - GDoF based distributed link scheduling and power control algorithm

Other Papers

- “Diffusion-Based Adaptive Distributed Detection: Steady-State Performance in the Slow Adaptation Regime”, *V. Matta, P. Braca, S. Marano, and A. H. Sayed*
- “Error Decay of (Almost) Consistent Signal Estimations From Quantized Gaussian Random Projections” *L. Jacques*
- “Degrees of Freedom of Uplink Downlink Multiantenna Cellular Networks”, *S.-W. Jeon and C. Suh*