Journal Watch
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- **System model:** $\boldsymbol{y} = \boldsymbol{\phi}\boldsymbol{x}$; $\boldsymbol{x}$ is K-sparse
  - T: support of $\boldsymbol{x}$, $|T| = K$
  - cK: number of OMP iterations for exact recovery, $c > 1$

Main Result

If $\boldsymbol{\phi}$ *obeys RIP of order* $\lfloor (c+1)K \rfloor$, *for exact recovery*

$$c \geq -\frac{4(1+\delta)}{1-\delta} \log\left(\frac{1}{2} - \sqrt{\frac{\delta}{2+2\delta}}\right).$$

- LB monotonically increases with the RIC δ
- Example: For Gaussian matrices $c \approx 2.8$ if $m \sim \mathcal{O}\left(K \log \frac{N}{K}\right)$

Optimal Transmit Strategy for MISO Channels With Joint Sum and Per-Antenna Power Constraints

Phuong Le Cao, Tobias J. Oechtering, Rafael F. Schaefer and Mikael Skoglund

- **Signal Model:** Point-to-point MISO channel: $y = \boldsymbol{x}^T \boldsymbol{h} + z$
- If $\boldsymbol{x}$ is normal such that $\boldsymbol{Q} = \mathbb{E}(\boldsymbol{x}\boldsymbol{x}^T)$, the **achievable rate** is

$$R = \log\left(1 + \frac{1}{\sigma^2}\boldsymbol{hQh}\right)$$

- **Constraints:** $\boldsymbol{Q} \succcurlyeq 0$, $\mathrm{Tr}(\boldsymbol{Q}) \leq P_{tot}$, and $\boldsymbol{Q}_{ii} \leq \hat{P}_i$

Contributions

1. *Gaussian distributed input is capacity-achieving with the constraints*
2. *A simple recursive algorithm to compute the optimal* $\boldsymbol{Q}$
   1. *Find optimal power allocation with sum power constraint only*
   2. *For antennas who violate per-antenna power constraint, allocate* $\hat{P}_i$
   3. *Divide the remaining power among the other antennas with reduced constraints*

Discrete Sum Rate Maximization for MISO Interference Broadcast Channels: Convex Approximations and Efficient Algorithms

Hoi-To Wai, QiangLi, and Wing-Kin Ma

- **System Model:**M transmitters serves K receivers in a unicast manner
- **Assumption:** Gaussian input $s_q(t)$ with $W_q = \mathbb{E}\{s_q(t)s_q(t)^T\}$
- **Goal:** Find $\{W_q\}_{q=1}^{KM}$ to maximize $\sum_q \lambda_q r_q$ such that $\forall q, i$

- Moment: $W_q \succcurlyeq 0$, $\text{Rank}\{W_q\} \leq 1$
- Power: $\sum_{q \in \mathcal{K}_i} \text{Tr}\{W_q\} \leq P_i$
- Discrete rate: $r_q \in \mathcal{R}$
- SINR: $\gamma(r_q) \leq SINR_q(W)$

Proposed Solution

- *Convex approximation formulation*
- *Low-complexity and decentralized optimization algorithms*

- **Measurement model:**

$$x_t = Fx_{t-1} + \epsilon_t^x; \qquad \epsilon_t^x \sim \mathcal{N}(0, Q)$$
$$y_t = Hx_t + \epsilon_t^y; \qquad \epsilon_t^y \sim \mathcal{N}(0, R)$$

- **Goal:** Estimation of system parameter matrices F and Q

Central Idea: Gibbs sampler

Sample alternately the conditional posterior distributions

1. $\pi(x_{1:T}|F, Q)$: *Gaussian obtained using Kalman Smoothing*
2. $\pi(F, Q|x_{1:T})$: *Matrix normal-inverse Wishart distribution*

- **Contribution:** Extension to the case when Q is singular

Other Papers

- **Enhanced PUMA for Direction-of-Arrival Estimation and Its Performance Analysis**
    - Cheng Qian, Lei Huang, Nicholas D. Sidiropoulos and Hing Cheung So
- **Bayesian Model for Multiple Change-Points Detection in Multivariate Time Series**
    - Flore Harlé, Florent Chatelain, Cédric Gouy-Pailler and Sophie Achard
- **Compressive Detection of Random Subspace Signals**
    - Alireza Razavi, Mikko Valkama and Danijela Cabric
- **Infection Spreading and Source Identification: A Hide and Seek Game**
    - Wuqiong Luo, Wee Peng Tay and Mei Leng