# Journal Watch
# IEEE Transactions on Signal Processing
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# Multiple Change-Points Estimation in Linear Regression Models via Sparse Group Lasso

Bingwen Zhang, Jun Geng, and Lifeng Lai

- **Model:** $y_t = \beta_t^{\mathsf{T}} x_t + e_t$
  - $\beta_t \in \mathbb{R}^p$ is sparse, change over time
- **Goal:** Estimate $\beta_t$ using $(x_t, y_t)_{t=1}^n$
- **Approach:** Group LASSO $\theta_t = \beta_t - \beta_{t-1}$

$$\min_{\theta \in \mathbb{R}^{np}} \left\{ \frac{1}{n} \left\| \boldsymbol{Y} - \tilde{\boldsymbol{X}} \boldsymbol{\theta} \right\|_2^2 + \lambda_n \left( \gamma \sum_{t=1}^{n} \left\| \boldsymbol{\theta}_t \right\|_2 + (1-\gamma) \left\| \boldsymbol{\theta} \right\|_1 \right) \right\}$$

  - $l_2 \rightarrow$ inter-group; $l_1 \rightarrow$intra-group sparsity
- **Other discussions**:
  1. Asymptotically consistent solution
  2. Choice of the regularization term $\lambda_n$
  3. Complexity of the algorithm

# Estimation of Spatially Correlated Random Fields in Heterogeneous Wireless Sensor Networks

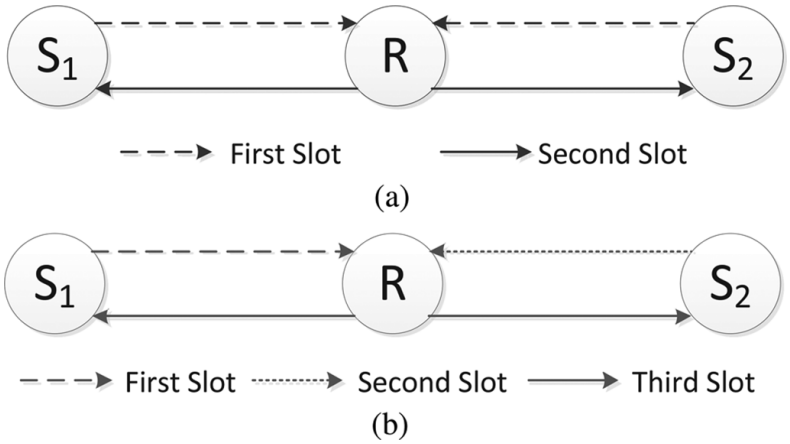
Ido Nevat, Gareth W. Peters, Francois Septier, and Tomoko Matsui

- **Problem:** Reconstruct spatial map of physical phenomena using heterogeneous WSN observations
  - sparse high quality sensors: unquantized noisy measurements
  - dense low-quality sensors: noisy binary measurements
- **Goals:**
  - MMSE spatial random field reconstruction
  - Spatial exeedance map
  - Spatial classification
- **Approach:** Compute predictive distribution at any arbitrary point in space
- **Mathematical tool:** Saddle-point type approximation
- Evaluation using real data sets of wind speeds measurements

# Performance Analysis of Antenna Selection in Two-Way Relay Networks

Kang Song, Baofeng Ji, Yongming Huang, Ming Xiao, and Luxi Yang

- **Problem:** all nodes select one of their antennas separately for transmission
  - Reciprocal channel with CSIT
- **Schemes:**
  1. Amplify and forward
  2. Decode and forward
- **Algorithms:**
  1. Max-Min selection
  2. Hybrid selection




- **Performance analysis**:
  1. PDF and CDF of the E2E SNR
  2. Outage probability
  3. BER

# Signal Recovery from Random Measurements via Extended Orthogonal Matching Pursuit

Sujit Kumar Sahoo, and Anamitra Makur

- **Model:** Noiseless linear model $\boldsymbol{y} = \boldsymbol{\phi s}$, where $\mathbf{s} \in \mathbb{R}^d$ is $m$ sparse vector
- **Conventional OMP:**
  - Run $m$ iterations to recovery $m-$sparse vector
  - No backtracking
- **Extended OMP** ($\text{OMP}_\alpha$)
  - Run $m + \lfloor \alpha m \rfloor$ iterations, where $0 \leq \alpha \leq 1$
  - Succeed if Supp $\{\boldsymbol{s}\} \subset$set of indices identified by $\text{OMP}_\alpha$; RIP of order $m + \lfloor \alpha m \rfloor$
  - High probability recovery with $O\left(m \ln \frac{d}{\alpha m+1}\right)$
- **Another extension**($\text{OMP}_\infty$)
  - No knowledge of $m$

# Other Papers

- **Joint Source Estimation and Localization**
  - S. Sahnoun, and P. Comon
- **Shallow Water Acoustic Channel Modeling Based on Analytical Second Order Statistics for Moving Transmitter/Receiver**
  - E. Baktash, M.J. Dehghani, M.R.F Nasab, and M. Karimi
- **Channel State Tracking for Large-Scale Distributed MIMO Communication Systems**
  - D.R. Brown, R. Wang, and S. Dasgupta
- **Sparsity-Aware Sensor Collaboration for Linear Coherent Estimation**
  - S. Liu, S. Kar, M. Fardad, and P.K. Varshney