

Journal Watch: TSP-Feb. 2014

February 8, 2014

Paper Title: Multiuser Diversity for Secrecy Communications Using Opportunistic Jammer Selection: Secure DoF and Jammer Scaling Law

Authors: Jung Hoon Lee, and Wan Choi

Affiliations: KAIST, Korea

- Opportunistic jammer selection proposed in wireless security system to increase the secure degrees of freedom between a transmitter and legitimate receiver (A and B)
- Uses an alternative measure to secrecy capacity: secure degrees of freedom
- Opportunistic IA achieves higher DoF compared to conventional IA schemes
- OJS: Align jamming signals at Bob's receiver via jammer selection, while these signals are not aligned at Eve
- Contributions: Define an alignment measure, propose two jammer selection schemes to obtain the secure DoF

Paper Title:Distributed Detection in Sensor Networks Over Fading Channels with Multiple Antenna at the fusion centre
Authors: Ido Nevat, Gareth Peters, and Iain B. Collings
Affiliations: Infocomm research, Singapore, UCL, CSIRO, Sydney

- Develop new and optimal algorithms for distributed detection in sensor networks over fading channels with multiple receive antennas at the FC
- Sensors observe phenomenon over fading channels and employ AF and transmit over fading channels to FC
- Papers till now: Perfect CSI between sensors and FC, sensors observe phenomenon over AWGN
- Contributions: Derive optimal decision rules and associated probabilities of detection and false alarm for three scenarios of CSI, in the case of fully unknown CSI: develop two new algorithms to derive the optimal decision rule
- Demonstrate that performance superior to vote decision fusion based algorithms

Paper Title: Learning Overcomplete Dictionaries based on Atom-by-Atom Updating

Authors: Mostafa Sadeghi, Massoud Babaie-Zadeh, and Christian Jutten

Affiliations: Sharif University, Tehran, and University of Grenoble, France

- Proposed: Dictionary learning algorithm that updates the atoms (columns) of the dictionary sequentially
- Typical: most algorithms consists of two stages: obtain sparse signal from training and then update dictionary-generalization of K-means clustering algorithm
- Contributions: 1. Parallel atom-updating-PAU-DL that performs better than K-SVD, 2. Algorithm that performs only the dictionary updation stage(considers sparse matrices)

Paper Title: GESPAR: Efficient Phase Retrieval of Sparse Signals

Authors: Yoav Shechtman, Amir Beck and Yonina C. Eldar

Affiliations:Technion-Israel

- Problem:

$$\begin{aligned} & \arg \min_{\mathbf{x}} \sum_{i=1}^N (|\mathbf{F}_i \mathbf{x}|^2 - y_i)^2 \\ \text{s.t. } & \|\mathbf{x}\|_0 \leq s, \quad \text{supp}(\mathbf{x}) \subset \{1, 2, \dots, n\} \end{aligned} \quad (1)$$

-Problem of phase retrieval

- Most popular approach: Quadratic Compressed sensing-does not scale to large problems
- Proposed technique: Gespar: Greedy sparse phase retrieval
- 2-d local search algorithm: Convergence to stationary point under suitable conditions

Other Papers

- Stochastic Ordering of Interference in Large-scale Networks: Junghoon Lee and Cihan Tepedelenlioglu, Member, Arizona State University
- Recovery of Low-Rank Matrices Under Affine Constraints via a Smoothed Rank Function: Mohammadreza Malek-Mohammadi, Massoud Babaie-Zadeh, Sharif University Tehran, and Christian Jutten, University of Grenoble
- Distributed Finite-Horizon Fusion Kalman Filtering for Bandwidth and Energy Constrained Wireless Sensor Networks: Bo Chen, Wen-An Zhang, and Li Yu