

Journal watch

IEEE Transactions on Signal Processing -April 2012 issue

Ranjitha P

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Title: Distributed Basis Pursuit

Authors: João F. C. Mota, João M. F. Xavier, Pedro M. Q. Aguiar, and Markus Puschel

Affiliations: Technical University of Lisbon, Portugal, Department of Computer Science, ETH Zurich.

- Propose a distributed algorithm for solving the basis pursuit problem.
- Algorithm for scenarios such as sensor networks where minimizing communication between nodes is also a priority.
- Assumptions: Measurement matrix is full rank, there is a path between all the nodes, static conditions.
- No node has complete knowledge of the measurement matrix, either have set of columns or set of rows.
- Proposed algorithm is implementation of the alternating direction method of multipliers.

Title: Beam Tracking for Interference Alignment in Slowly Fading MIMO Interference Channels: A Perturbations Approach Under a Linear Framework

Authors: Heejung Yu, Youngchul Sung, Haksoo Kim, and Yong H. Lee

Affiliation: KAIST, South Korea

- Beam design for signal space interference alignment in slowly fading multiuser MIMO interference channels.
- In the scenario considered, beamforming vectors need to be computed at every time step.
- Novel method: Exploits the dependency of channels between consecutive time steps, i.e., beam solution of the current time is a slightly updated version of the beam of the previous time instant: Calls for a recursive approach.
- Use the matrix perturbation theory to obtain such beam forming vectors - uses subspace tracking methods.
- Tracking performance of the algorithm analyzed in terms of MSE and sum data rate.

Title: Detecting and Counteracting Statistical Attacks in Cooperative Spectrum Sensing

Authors: Federico Penna, Yifan Sun, Lara Dolecek, and Danijela Cabric

Affiliation: Fraunhofer Heinrich Hertz Institute, Berlin, University of California at Los Angeles (UCLA)

- Propose a novel Bayesian method to improve the robustness of cooperative spectrum sensing against misbehaving secondary users.
- Adopt a statistical adopt model in which every malicious node is characterized by a certain probability of attack.
- Key features- combined spectrum sensing, identification of malicious users, and estimation of their attack probabilities; use belief propagation on factor graphs to efficiently solve the Bayesian estimation problem.
- Analytical expressions for global false alarm and missed detection probability.

Title: Adaptive Data Fusion for Wireless Localization in Harsh Environments

Authors: Javier Prieto, Santiago Mazuelas, Alfonso Bahillo, Patricia Fernandez, Rubn M. Lorenzo, and Evaristo J. Abril

Affiliations: University of Valladolid, Spain, Massachusetts Institute of Technology, Cambridge

- Range Estimation: Propose a framework for data fusion in localization systems based on determining likelihood function which represent to relationship between measurements and distances.
- Focus: Location based services in dense urban and indoor environments (multipath and NLOS).
- In range estimation from RSS and TOA: derive posterior distribution of the range given the measurements.
- Non-static conditions: Range varies with time. Hence, use tracking techniques - Particle filters are used if the underlying model non-Gaussian and non-linear.

Other relevant papers

- Robust Secure Transmission in MISO Channels Based on Worst-Case Optimization : Jing Huang, and A. Lee Swindlehurst
- Robust detection of Noise Standard deviation in Presence of Signals With Unknown Distributions and Occurrences: D. Pastor and F. X. Socheleau
- Active Co-operation Between Primary Users and Cognitive Radio Users in Heterogeneous Ad-Hoc Networks : W. Su, J. D. Matyjias, and S. Batalama
- Sensing and Probing Cardinalities for Active Cognitive Radios: T. V. Nguyen, H. Shin, T. Q. S. Quek, and M. Z. Win