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Asymptotically Optimal Parameter Estimation With Scheduled Measurements

K. You and S. Song, Tsinghua University, Beijing
L. Xie, NTU, Singapore

- Objective: Sensors communicate K number of measurements to a central estimator, and schedule measurements to reduce comm. cost
- At sensor, design scheduler that helps in attaining good estimate under transmission rate constraint
- MLE is considered
- Derives CRLB, and design scheduler to minimize the inverse of fisher information under rate constraint
- Intractable optimization problem, so proposes a sub-optimal design
- MLE depends on design parameters (which depends on parameter to be estimated), so devise an EM based algorithm to recursively solve the problem

Robust Downlink Beamforming With Partial Channel State Information for Conventional and Cognitive Radio Networks

I. Wajid, M. Pesavento, and D. Ciochina, Technische Universitat Darmstadt, Germany
Y. C. Eldar, Technion University, Israel

- Objective: Designing robust downlink beamforming vector to mitigate interference at user terminals and increase user QoS
- Beamforming is effective when perfect CSI is known at base station
- Under imperfect CSI, beamforming vectors are designed under outage probability constraints (assumes distribution on CSI error)
- Instead of CSI, when 2^{nd} order statistics of CSI like covariance is fed back, beamforming vectors are designed for worst case CSI errors
- This paper considers a SN in femto cell coexisting with a PN in macro cell
- Designs beamforming vector to minimize interference to PN and maximize QoS of SN

Energy Efficient Spectrum Sharing Strategy Selection for Cognitive MIMO Interference Channels

W. Zhong, College of Communications Engineering, Nanjing, China
J. Wang, National Mobile Communications Research Laboratory, Nanjing, China

- Scenario: Cognitive MIMO system in the presence of primary, share spectrum opportunistically
- Goal: design energy efficient cognitive MIMO system with imperfect CSIT
- Code book based limited feedback precoding (CBLFP) is considered to mitigate interference
- Discrete power control is considered
- Receiver feeds back CBLFP and discrete power levels
- Choose Code and power level to satisfy minimum rate (QoS) constraint of SN and interference constraint of PN

Exploiting Sparse Dynamics For Bandwidth Reduction In Cooperative Sensing Systems

Harish Ganapathy, and Constantine Caramanis, UT Austin
Lei Ying, Arizona State University, USA

- Scenario: A group of sensor nodes transmitting their measurements to a Central node over orthogonal channels
- Goal: To reduce the number of orthogonal channels to transmit data using sparse dynamics of the measured signal
- Example: TV transmitters would turn ON/OFF on a significantly slower time-scale than sensor measurement windows
- In a given measurement window, only a subset of primaries change their signal
- Uses ideas from subset selection and compressive sensing to reduce bandwidth requirement

Other papers

- Multi-Cell Random Beamforming: Achievable Rate and Degrees of Freedom Region
- Fusion of Algorithms for Compressed Sensing
- Compressed Sensing and Affine Rank Minimization Under Restricted Isometry
- Comparison of Distributed Beamforming Algorithms for MIMO Interference Networks