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Compressed Sensing-Aided Downlink Channel Training for FDD Massive MIMO Systems

- Y. Han, J. Lee, and D. J. Love
- Downlink channel estimation in FDD massive MIMO systems
- Goal: reduce training overhead using CS + MMSE approach
  - Exploits the fact that channel covariance is slowly varying
  - Training phase in two parts: orthogonal training + compressive training
- Assump.: Support of the channel in angular domain is slowly varying
  - Separate the channel into a sparse vector and a dense vector
  - Sparse vector: change in support, i.e., new entries added/deleted
    - Estimated using CS, uses compressive training interval
  - Dense vector: common support
    - Estimated using LS, uses orthogonal training interval

Sai, Vaibhav

Random Access for M2M Communications With QoS Guarantees

- R. Abbas, M. Shirvanimoghaddam, Y. Li, and B. Vucetic, U. Sydney
- Slotted uncoordinated transmission; users divided into groups; frames divided into sub-frames of different sizes
- In each sub-frame, each group is assigned an access probability
  - Ack-Group: Different groups transmit over orthogonal resources
  - Ack-All: All groups are allowed to transmit on all resources
- BS employs SIC
- Closed-form expressions for the probability of device resolution
  - Use the expressions to optimize access probability
- Outperforms standard coordinated access schemes and some of the recently proposed random access schemes

Scalable Spectrum Allocation and User Association in Networks With Many Small Cells

- B. Zhuang, D. Guo, E. Wei, and M. L. Honig
- Allocation of resources across a large number of densely deployed small cells, given the traffic statistics
  - User association and spectrum allocation
  - Formulated as a convex optimization problem
- For improved scalability: local clustering
  - But need to account for inter-cluster interference
  - Model the problem as a hypergraph coloring problem
  - Iterative solution: convex optimization for BW allocation; followed by global spectrum allocation using hypergraph graph coloring
- Several-fold better throughput compared to strongest AP association and full spectrum reuse across APs.

Chethan

Multiple Target Counting and Localization Using Variational Bayesian EM Algorithm in Wireless Sensor Networks

- B. Sun, Y. Guo, N. Li, and D. Fang
- Localization based on CS: assumes target on a grid
  - Poor performance when the assumption is violated
- Propose an iterative multiple target counting and localization method
  - Adjust the grid dynamically to alleviate mismatch
  - Joint sparse signal recovery and parameter estimation problem
  - Solved using variational Bayesian EM algorithm
- Simulation results to illustrate performance

Throughput-Optimal Scheduling and Rate Adaptation for Reduced Feedback Best-M Scheme in OFDM Systems

- J. Francis and N. B. Mehta , IISc Bangalore
- Each user feeds back the best M subchannels and their indices to BS
- Throughput optimal scheduling and rate adaptation policy
  - Maximizes the product of the rate and the conditional probability of success given the feedback from all users, summed across users
- Exploits subchannel correlation (closed-form for exponential corr.)
- Low-complexity 2-subchannel reduction: near optimal
  - Handles general correlation models, quantized feedback and co-channel intf.
- Modified gradient-based opportunistic scheduler: ensures fairness

Resource Allocation for D2D-Enabled Vehicular Communications

- L. Liang, G. Y. Li, and W. Xu
- Two types of links: V2I and V2V
  - V2I: needs high capacity: ergodic capacity
  - V2V: needs high reliability: outage probability constraint
  - Goal: maximize sum rate or min rate across V2I links
- Link scheduling based on channel statistics
- Nonconvex optimization problem: two step approach
  - Optimal power allocation for a given spectrum reuse pattern
  - Check feasibility of constraints, rule out infeasible pairs, and reallocate spectrum reuse pattern using the Hungarian method
  - Claims to find the globally optimal solution

Sireesha