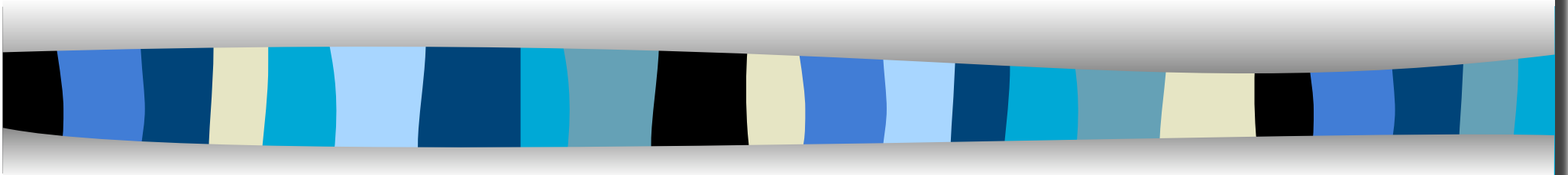# Conference Watch: ISIT 2011

Presented by Chandra R. Murthy on
Aug. 20, 2011

The role of diversity in sparsity estimation

- G. Reeves, M. Gastpar, UC Berkeley
- Sparsity pattern estimation (SPE)
- Problem in sparse recovery: if some of the non-zero values are small
  - MMV can help – value may be larger in other instantiations of the sparse vector
  - But too much "variety" => too many unknowns
- Given a total num. meas., there is an optimal amount of "diversity" for SPE
- Bounds on SPE are derived

Capacity of Gaussian channels with duty cycle and power constraints

- L. Zhang and D. Guo, Northwestern Univ.
- What is the capacity-optimal signaling over a Gaussian channel under a duty-cycle and an average power constraint?
- Ans: discrete distribution!
  - Duty-cycle = fraction of zeros in the codeword
  - Numerical optimization of distribution necessary
- Key reason for improvement: positions of zero symbols convey considerable info!

Stability region of random multiple access under stochastic energy harvesting

- J. Jeon, A. Ephremides, UMCP

- Two EHS nodes with random access based on a slotted ALOHA
  - Harvested energy and battery energy level modeled as stochastic processes
  - Given a energy harvesting rate, what are the set of arrival rates for which the queues remain stable?

- Characterize the stability region of queues as a set of inequalities

Joint pilot and precoder design for optimal throughput

- A. Pastore, M. Joham, J.R. Fonollosa, U. Politechnica de Catalunya

- Joint pilot sequence and precoder design for correlated MIMO

- Assume fixed training and data powers

- Design pilot & precoder to maximize the lower bound on mutual information
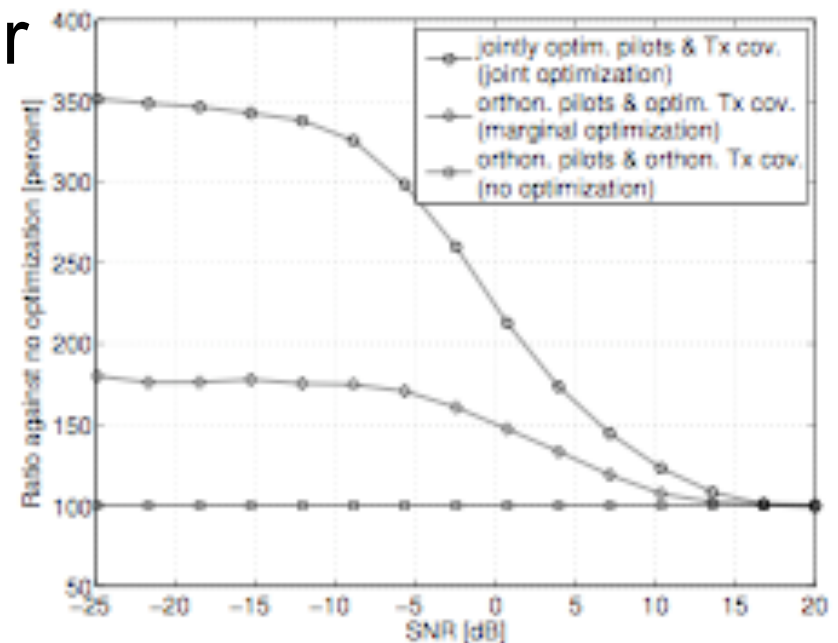
Causal state amplification

- C. Choudhuri, Y. H. Kim, U. Mitra, USC/UCSD

- State information xmission with causally known state over a DMC studied

- Block Markov encoding + state estimation conditioned on treating decoded message and received channel output as side information => min. state estmn. error

- Any optimal tradeoff pair can be obtained splitting rate betn info. Xmission and state estmn
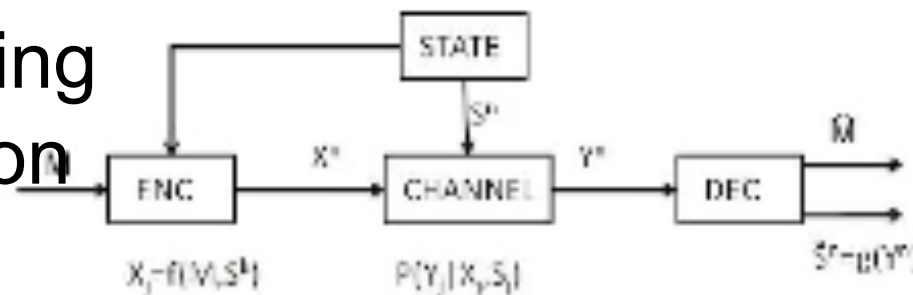
Target localization with binary observns: effect of non-detecting sensors

- A. Shoari, A. Seyedi

- Target localization with binary measurements by a set of nodes

- How much information is lost by neglecting the non-detecting nodes?
  - Nodes may fail to detect due to miss-detections
  - False alarms not considered (it seems)

- Ans: compute loss in Fisher information

- They show that the loss is significant!

Other papers of interest (titles only)

- Min. variance estmn for the sparse signal in noise model
- On the capacity of a channel with action-dependent state and reversible input
- Degrees of freedom work of Chinmay Vaze, Mahesh Varanasi
- Interference, cooperation and connectivity – a dof perspective
- Multipass Lasso algorithms for sparse signal recovery
- Localization from incomplete noisy distance measurements
- The capacity per unit energy of large wireless networks
- Distributed resource allocation for proportional fairness in multi-band wireless systems
- "Hybrid coding" papers by Young-Han Kim
- Fast averaging
- Etc etc!