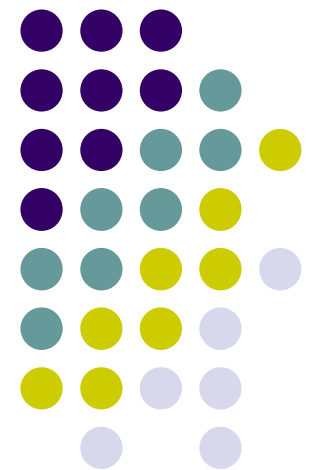


Jl. Watch on Transactions of Communications Jan 2012

T. Ganesan
SPC Lab
10-Mar-2012



Non Cooperative Space-Time Communication for Energy Efficiency in Sensor Networks



Author(s): E. P. Tsakalaki, O. N. Alrabadi, A. Kalis, C. B. Papadias, and R. Prasad, (AIT Greece and AAU Denmark)

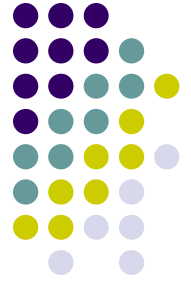
Problem Addressed:

- A simple non-cooperative method proposed using switched antenna (single RF chain).
 - Cooperative scheme have the overhead of synchronization among nodes.
 - Additional overhead of data exchange among nodes.

Contributions:

- Emulate Alamouti code using switched antenna and single RF chain under fixed rate BPSK.
- Uses the time switched space-time codes for variable rate M-QAM.
- Compare energy efficiency with SISO and cooperative MIMO.

Low-Complexity Multi-Stream Space-Time Codes– Part I: Direct-Sum Codes and Design Criteria



Author(s): E. Stauffer and B. Hochwald, Broadcomm, Univ. Of Notre Dame

Problem Addressed:

- Define Multi-Stream STC performance criteria and
- Design of STC suited to Multi-Stream assuming Max-Log MAP decoder for each stream.

Contributions:

- Design hierarchical codes for multi-antenna system.
 - Combine hierarchical modulation with existing STBC in a “Direct Sum”.
 - Combine hierarchical modulation with Spatial multiplexing.
- Proposed “non-Direct Sum” codes which outperform the .Direct Sum codes (in Part –II)

A Decode and Forward Protocol for Two-Stage Gaussian Relay Networks



Author(s): B. Muthuramalingam, S. Bhashyam, and A. Thangaraj, IITM

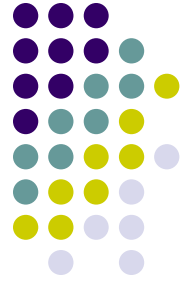
Problem Addressed:

- 2-Stage Gaussian Relay network with Decoder and Forward Relays
- Define scheduling and coding strategies.

Contributions:

- A heuristic scheduling using 2 state multi-hopping protocol proposed.
- DPC based coding and Iterative decoding based coding strategy proposed.
- Information theoretic rate regions were derived and solved for 2 types of interference (a) Strong interference and (b) weak interference.
- Analytically shown that it meets the cut-set bound for maximum information flow.

Spectrum Sensing Algorithms via Finite Random Matrices



- **Author(s):** W. Zhang, G. Abreu, M. Inamori and Y. Sanada, Keio Univ, Hiyoshi, Japan, Jacob Univ. Bremen gGmbH, Germany

Problem Addressed:

- Spectrum sensing of Primary using hypothesis testing
- Statistics of condition number of Wishart matrices is used.

Contributions:

- Closed form expression for the CDF of standard condition number of finite Wishart matrices is derived.
- Based on the SCN, Hypothesis testing is formulated.
- ROC analysis is done on the proposed methods and compared with other asymptotic random matrix based methods.

Capacity of Second-Order Cyclostationary Complex Gaussian Noise Channels



- **Author(s):** B. W. Han and J. H. Cho, Pohang Univ. of Science and Technology, Korea.

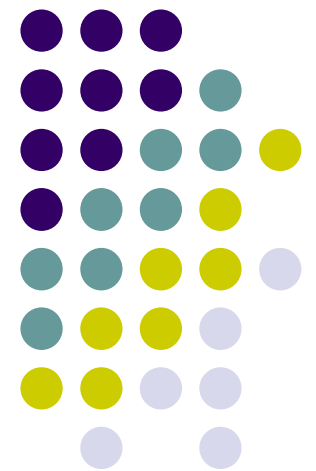
Problem Addressed:

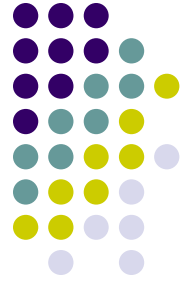
- Capacity of band limited, LTI, frequency selective SISO channel corrupted by second order cyclo-stationary complex Gaussian noise.
- Statistics of condition number of Wishart matrices is used.

Contributions:

- SISO Channel converted to equivalent MIMO LTI channel with WSS Gaussian noise.
- An optimization problem formulated to maximize the capacity with power constraint P .
- The optimal SISO channel input which achieves this capacity is similar to Water filling in freq domain with Second order cyclo-stationary Gaussian with same period of channel noise.

Backup





Other Interesting Papers in this issue

- Design and Analysis of Optimal Random Access Policies in Cognitive Radio Networks
- Interleaver Structures for Channel Estimation and Decoding on the Frequency Selective Fading Channel
- EM-Based Adaptive Frequency Domain Estimation of Doppler Shifts with CRLB Analysis for CDMA Systems
- On the Cooperative Diversity Gain in Underlay Cognitive Radio Systems
- Optimal Packet Scheduling in an Energy Harvesting Communication System