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Editorial -- Part II

This is the second part of the special issue "Space-Time Coding and Its Applications." In this part, there are ten papers covering capacity of space-time coded systems, space-time code designs, decoding methods for space-time coded transmissions, and MIMO systems.

The first paper by C. B. Papadias and G. J. Foshini is in the area of capacity issues of space-time coded MIMO systems. This paper considers some capacity issues of some space-time coded systems. It proposes attainable capacities that mean the capacities achieved by different techniques with the use of progressively stronger known encoding/decoding techniques.

The second three papers are in the area of space-time code designs. The paper by W. Firmanto, Z. Chen, B Vucetic, and J. Yuan presents a design of space-time turbo trellis coded modulation by proposing a new recursive space-time trellis coded modulation. The proposed scheme is less than 3dB away from the theoretical capacity bound for MIMO channels. The paper by H.-J. Su and E. Geraniotis considers some detailed design issues and tradeoffs of a space-time coded MIMO system.
The paper by S. A. Zummo and S. A. Al-Semari presents a 8PSK trellis space-time code design that is suitable for rapid fading channels. They propose two approaches fir their design: (i) to maximize the symbol-wise Hamming distance between signals leaving from or remerging to the same encoder's state; (ii) to partition a set based on maximizing the sum of squared Euclidean distances and also the branch-wise Hamming distance.

The next four papers are in the area of the decoding/demodulation of space-time coded systems. The paper by H. A. Cirpan, E. Panayirci, and E. Cekli considers the problem of blind estimation of space-time coded signals along with the channel parameters. In this paper, both conditional and unconditional maximum likelihood approaches are developed and iterative solutions are proposed. The paper by K. F. Lee and D. B. Williams considers space-time coded orthogonal frequency division multiplexing (OFDM) systems with multi-transmit antennas. In this paper, a low complexity, bandwidth efficient, pilot-symbol-assisted channel estimator for multi-transmit antenna OFDM systems is proposed. The paper by N. Sellami, I. Fijalkow, and M. Siala presents a low complexity turbo-detector scheme for space-time coded frequency selective MIMO channels. The paper by G. Wang, A. Song, and X.-G. Xia proposes an equalization method for a differentially space-time coded system over frequency-selective fading channels.

The final two papers are in the general area of MIMO systems. The paper by B. Chen and A. P. petropulu addresses the problem of blind identification of a convolutive MIMO system with more inputs than outputs. It considers the problem in the frequency domain, where, for each frequency it constructs two sensors based on cross-polyspectra of the output. The paper by H. Vikalo and B. Hassibi presents a sphere decoder for the sequence detection in multiple antenna communication systems over dispersive channels. The sphere decoder provides the ML estimator with computational complexity comparable to the standard space-time decision-feedback equalizing (DFE) algorithms.