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Distributed Convolutional- Based Coding for Cooperative Systems

By

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Whenever size, power, or other constraints preclude the use of multiple-input Multiple-output (MIMO) systems, wireless systems cannot benefit from the well known advantages of space-time coding (STC) methods. Also the complexity (multiple radio-frequency (RF) front ends at both the transmitter and the receiver), channel estimation, and spatial correlation in centralized MIMO systems degrade the performance. In situations like these, the alternative would be to resort to cooperative communications via multiple relay nodes. When these nodes work cooperatively, they form a virtual MIMO system. The destination receives multiple versions of the same message from the source and one or more relays, and combines these to create diversity. In uncoded cooperative communication networks, the diversity of the system degrades significantly. This diversity degradation is attributed to the errors made at the relay nodes. Consequently, if better reliability is achieved at the relay nodes, the diversity may improve, or even may be preserved, as compared to the error-free case. In this talk we will go over coding schemes suitable for relay channels that aim at improving the end-to-end performance of such systems.

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