

Journal Watch

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Interference Networks With Point-to-Point Codes

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Interference Networks With P2P Codes

- Gaussian Interference Channel with $K + 1$ Trans-Receive Pairs
- All the pairs constrained to use Gaussian point to point codes
- The capacity region is shown to be strictly larger in general than the achievable rate regions when treating interference as noise, using successive interference cancellation decoding, and using joint decoding.
- Result can be extended to the case when the transmitters are only constrained to use codes that are capacity-achieving for the point-to-point and multiple access channels, but not necessarily Gaussian-like.

Shannon Meets Nash on the Interference Channel

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Claude Meets John on the Interference Channel

- Information Theoretic Nash Equilibrium (NE) region of the two-user linear deterministic IC is formulated.
- A users pay-off is equal to the rate of the code provided that the probability of error is no greater than ϵ .
- A strategy pair is NE if neither user can unilaterally deviate and improve their performance.
- Similarly, a strategy pair (η -NE), if neither user can unilaterally deviate and improve their pay-off by more than η .
- The Nash equilibrium region of the interference channel is the closure equilibrium region of the set of achievable rate pairs that is η -NE.

Effect of Primary User Traffic on Sensing-Throughput Tradeoff for Cognitive Radios

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Sensing-Throughput Tradeoff for CR

- Primary and Secondary Users Coexist
- Channel is Idle or Busy with an exponential holding time
- State transition may occur during sensing duration
- There is an optimal sensing time for average throughput maximization
- Random arrival and departure of primary leads to performance degradation.

Energy Detection Based Cooperative Spectrum Sensing in Cognitive Radio Networks

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- Detection performance of an energy detector used for cooperative spectrum sensing in a cognitive radio network is investigated over channels with multipath fading.
- Detection performance of cooperative spectrum sensing is studied for data fusion and decision fusion strategies.