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Discrete-Rate Adaptation and Selection in Energy Harvesting Wireless Systems

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- **Objective:** To address the problem of maximizing the long-term average throughput of single and multiple EH node systems operating with discrete-rate adaptation

- **System Model:** A system with K EH nodes transmitting information to a sink over a block fading channel of known bandwidth ($K=1 \Rightarrow$ single EH node system)

  Main Contributions:

- For a system with single EH node, an optimal discrete-rate adaptation scheme proposed considering stationary and ergodic EH and fading processes

- For a system with non-EH nodes, a throughput-optimal and joint selection rate adaptive rule (TOJSRA) proposed

- A selection and adaptation rule for multi-EH node system based on TOJSRA presented

On Joint Power and Admission Control in Underlay Cellular Cognitive Radio Networks

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- **Objective:** To investigate the problem of joint power and admission control in underlay cellular cognitive radio networks
- **System Model:** A network with primary and secondary (cognitive) cellular users communicating with a single primary and secondary base station respectively

  Main Contributions:
- A relationship between the SINR vector and transmit power vector of all the users in the network
- Two centralized algorithms for optimizing the outage ratio in an infeasible system. Complexities of the algorithms – $O(M_s^2)$ and $O(M_s \log(M_s))$; M_s – no. of sec. users
- For a feasible system, a non-linear throughput-maximization problem solved through transformation to a linear programming problem

Collaborative Wireless Energy and Information Transfer in Interference Channel

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- **Objective:** To study SWIPT in a multi-user wireless environment
- **System Model:** A system with distributed transmitters transmitting information to their respective receivers independently but cooperatively transmitting wireless power to all receivers

  Main Contributions:
- A transmit scheme called *signal splitting* is proposed for collaborative energy beamforming
- An optimal receiver mode-switching rule and transmit optimization for 2-user system presented. The achievable rate-energy regions are shown to be enlarged when compared to schemes with partial/no cooperation
- For multi-user systems, (a) pairwise grouping to constitute 2-user groups performed, and results for 2-user scenario applied, and (b) ergodic interference alignment for cooperative WET considered

Priori-Information Aided Iterative Hard Threshold: A Low-Complexity High-Accuracy Compressive Sensing Based Channel Estimation for TDS-OFDM

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- **Objective:** To design a low-complexity channel estimation scheme based on compressive sensing for TDS-OFDM

  Main Contributions:

- A step-by-step procedure for acquiring channel state information from the training sequence – priori information

- Based on the coarse channel estimate obtained above, a PA-IHT algorithm proposed to obtain accurate channel estimate (ML) with fewer iterations when compared to IHT

- Improvement over existing Cs-based CE techniques like subspace pursuit and CoSaMP in terms of reduced complexity

Some More Papers

- Space-Time Coded Spatial Modulated Physical Layer Network Coding for Two-Way Relaying
- Performance Analysis of Volume-Based Spectrum Sensing for Cognitive Radio
- Throughput Analysis of Cooperative Communication in Wireless Ad Hoc Networks With Frequency Reuse