IEEE Trans. On Wireless Communications, Nov 2014

Vinnu Bhardwaj

SPC Lab

Nov 22nd , 2014

Cooperative Communication with Unreliable relays

Sang Wu Kim

- System Model:

  - Relays : Receive, Process and forward the message to the destination

  - Relays cannot reliably decode the message

- Current Solution : Each relay determines if the message is correctly decoded

  - Message discarded if determined to be erroneous

  - Lose useful information as the decoder output at the relay is correlated

- New strategy :

  - Destination helps in the decision making process

  - Motivation : Destination has additional information about the message

  - All relays forward their decoded outputs as long as destination can decode the message using global information

- Results :

  - Significant improvement over AF, SDF in terms of end-to-end outage probability

Optimization of Source/Relay Wireless Networks With Multiuser Nodes

Alessandro Nordio, Carla-Fabiana Chiasserini, and
Alberto Tarable,

- System Model

  - Wireless Arbitrary Network: N nodes + 1 gateway

  - Nodes : Sources of independent messages to be delivered to the gateway, possibly at different rates

  - Nodes may be energy-constrained

  - Nodes can perform Multi-user Detection

- Objective : To maximize the rate of the network

- Approach:

  - Define possible network states

  - A state: set of active links and the rates of those links

  - Optimization problem formulated as a linear programming problem to determine the amount of time the network stays in a particular state

- Result : Optimal strategy to maximize the data rate achievable by the network

On Non-Cooperative Multiple-Target Tracking With Wireless Sensor Networks

Ye Zhu, Anil Vikram, Huirong Fu and Yong Guan,

- Objective: To track multiple targets with wireless sensor networks

- Model:

  - Uncooperative environment: sensors cannot distinguish targets

  - Targets moving under a speed limit

  - Sensors have access to *aggregate* data

  - Interference from other targets is **NOT** negligible

- Approach based on Blind Source Separation (BSS)

- Output of the BSS algorithm contains noise signals, partial signals etc.

- Propose a clustering and selecting algorithm to remove noise and artifacts introduced by BSS algorithm

- Theoretically and experimentally show that the tracking algorithm can track targets both accurately and precisely

On the Optimal Transmission Policy in Hybrid Energy Supply Wireless Communication Systems

Yuyi Mao, Guanding Yu and Zhaoyang Zhang

- System Model :

  - Point-to-point communication link with hybrid energy supply

  - Data transmission not allowed during energy harvesting

  - $\rho \in [0,1]$: Ratio of harvesting time to length of the time slot

- Optimal saving factor to minimize the outage probability

- Battery Energy Consumption Minimization problems :

  - Single Packet Arrival Scenario

  - Burst Packet arrival scenario

- Solutions:

  - Offline Policy : full knowledge of the harvesting power and channel gains

    - Divide the optimization problem into two sub problems

    - Propose the optimal DP and a suboptimal greedy algorithm

  - Online Policy : Causal knowledge of harvesting powers and channel gains

    - Develop optimal policy using stochastic DP

- Optimal Price-Based Power Control Algorithm in Cognitive Radio Networks

  Zhengqiang Wang, Lingge Jiang, and Chen He

- Jointly Optimal Sensing and Resource Allocation for Multiuser Interweave Cognitive Radios

  Luis M. Lopez-Ramos, Antonio G. Marques, and Javier Ramos

- Evaluation of Distributed Multi-User MIMO-OFDM With Limited Feedback

  Stefan Schwarz and Markus Rupp