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- ▶ Optimal Social-Aware Peer Discovery for D2D Communications Underlying Cellular Networks

Authors: Bentao Zhang, Yong Li, Depeng Jin, Pan Hui and Zhu Han

System Model, Goal & Contributions

- ▶ **Motivation:** Can the social behavior of device owners used to assist the device discovery procedure?
- ▶ Community and encounter pattern
- ▶ Devices with higher *centralities* have more contacts: should be allocated more resources for device discovery
- ▶ D2D Discovery scheme:
 - ▶ How to group the cellular users: *K-Clique*
 - ▶ Probing Mode: if all nodes probing periodically, then not probing periodically is suboptimal
 - ▶ Optimal Probing Rate subject to total energy constraints of all nodes: proportional to contact frequency

▶ DASS: Distributed Adaptive Sparse Sensing

Authors: Zichong Chen, Juri Ranieri, Runwei Zhang and Martin Vetterli

System Model, Goal, & Contribution

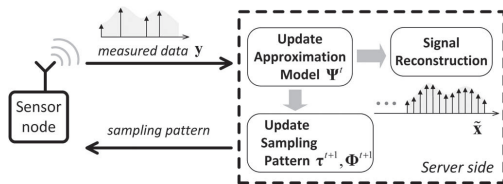
- ▶ Setup:

$$\mathbf{y} = \Phi^t \mathbf{x} + \mathbf{w}$$

where $x = \Psi^t \alpha$

- ▶ Goals:

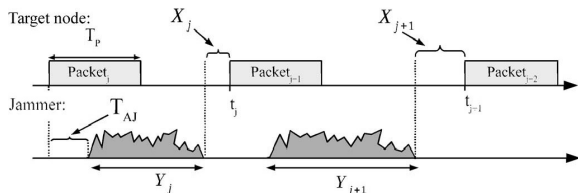
- ▶ *adaptively* learning the Ψ^t and α from measurements y , (Online PCA)
- ▶ Optimize Φ^t at the t^{th} block according to Ψ^t (Previous work)
- ▶ Signal reconstruction: least-square



- ▶ Defeating Jamming With the Power of Silence: A Game-Theoretic Analysis

Authors: Salvatore D'Oro, Laura Galluccio, Giacomo Morabito, Sergio Palazzo, Lin Chen, and Fabio Martignon

System Model and Goal



- ▶ information is encoded in the time interval X_j
- ▶ Energy constrained *reactive* jammer
- ▶ Target node utility, $U_T(x, y) = C(x, y) - c_T^* \cdot T_p \cdot P_T$
- ▶ Jammer utility, $U_J(x, y) = -C(x, y) - c_T \cdot y \cdot P_J$
- ▶ Target node and Jammer strategies are x and y , respectively

Contributions

- ▶ Case I: when both nodes play their strategies simultaneously
 - ▶ Prove the existence, uniqueness and convergence to Nash equilibrium (NE) under best response dynamics
- ▶ Case II: when target (the leader) anticipates the action of jammer (the follower)
 - ▶ Analyze the Stackelberg game (SG) in two scenarios:
perfect and imperfect knowledge about c_T
 - ▶ Stackelberg equilibrium exist in case of perfect information
 - ▶ Under certain conditions, in SG the target node improves its utility as compared to NE

- ▶ Energy Management and Cross Layer Optimization for Wireless Sensor Networks Powered by Heterogeneous Energy Sources

Authors: Weiquiang Xu, Yushu Zhang, Qingjiang Shi, and Xiaodong Wang

System Model, Goal & Contributions

- ▶ A set of general interconnected multi-hop WSN
- ▶ Nodes are powered by: energy harvesting or grid supply, or both
- ▶ At each node two-type of traffic: *local and relay*
- ▶ Energy consumption at each node: communication, processing and reception
- ▶ At each node multiple independent data sources.
- ▶ **Goal:** To maximize the long-term time averaged utility, subject to queue length, energy harvesting, network stability.
- ▶ Used Lyapunov drift-plus-penalty technique with perturbation to get a distributed low-complexity solution.