

**TWC Sep. 2012**

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# Multi-User Diversity vs. Accurate State Information in MIMO Downlink Channels

- N. Ravindran, N. Jindal, U. Minnesota
- **Which is better:** (a) low-rate, coarse feedback from all users, or (b) high-rate, fine fb from a subset of users?
- **Tradeoff:** multiuser diversity vs. accurate BF
- **Result:** (b) is better in terms of **sum rate!**

## Performance Modeling of a Two-Tier Primary-Secondary Network Operated with IEEE 802.11 DCF Mechanism

- M. Khabazian, S. Aissa, N. Tadayon, U. Quebec
- SU contend with PU if they find the channel idle for a **certain period of time**
- Derive the **total average delay**, transmission and collision probabilities of PUs and SUs
- Quantify how the SU nwk affects PU nwk
- Analysis based on **Bianchi's assumps. [JSAC Mar. 2000]**

# A Learning Framework for Cognitive Interference Networks with Partial and Noisy Observations

- M. Levorato, S. Firouzabadi, A. Goldsmith, Stanford
- Interweave access: typically assumes PU activity independent of SU activity
  - In reality, SU causes PU **reactions**: reTx, PC, etc
  - The PU reactions affect the future state of nwk
- PU state: finite collection of buffer states etc
- Goal: find a strategy at SUs for minimizing a cost function while generating a bounded perf. loss on the PU nwk
  - Need strategy indep. of statistics of underlying Markov process that governs the PU state (assumed unknown)
  - Claim: first algo for constrained POMDP with no knowledge of the underlying Markov process

# Characterizing Decentralized Wireless Networks with Temporal Correlation in the Low Outage Regime

- K. Gulati, RK Ganti, JG Andrews, BL Evans, S. Srikanteswara, UT Austin
- Key point: interference correlated in time since transmissions last multiple slots
- Contributions:
  - Joint temporal interference statistics derived
  - Analytical expns. for local delay, throughput outage probability, avg. throughput
  - Study throughput-delay-reliability tradeoffs

# Other Papers

- Effective Capacity for Multi-Rate Relay Channels with Delay Constraint Exploiting Adaptive Cooperative Diversity
  - JS Harsini and M. Zorzi
- Physical Layer Integration of Private, Common, and Confidential Messages in Bidirectional Relay Networks
  - RF Wyrembelski and H. Boche
- Improper Gaussian Signaling on the Two-User SISO Interference Channel
  - ZKM Ho and E. Jorswieck
- Achieving “Massive MIMO” Spectral Efficiency with a Not-so-Large Number of Antennas
  - H. Huh, G. Caire, HC Papadopoulos, and S.A. Ramprasad
- Sensing Time and Power Optimization in MIMO Cognitive Radio Networks
  - F. Moghimi, RK Mallik, and R. Schober