IEEE Transactions on Wireless Communications

December 2015

Journal watch

By Ribhu
SPC Lab,IISc

Mode Switching for energy efficient D2D communication in cellular networks

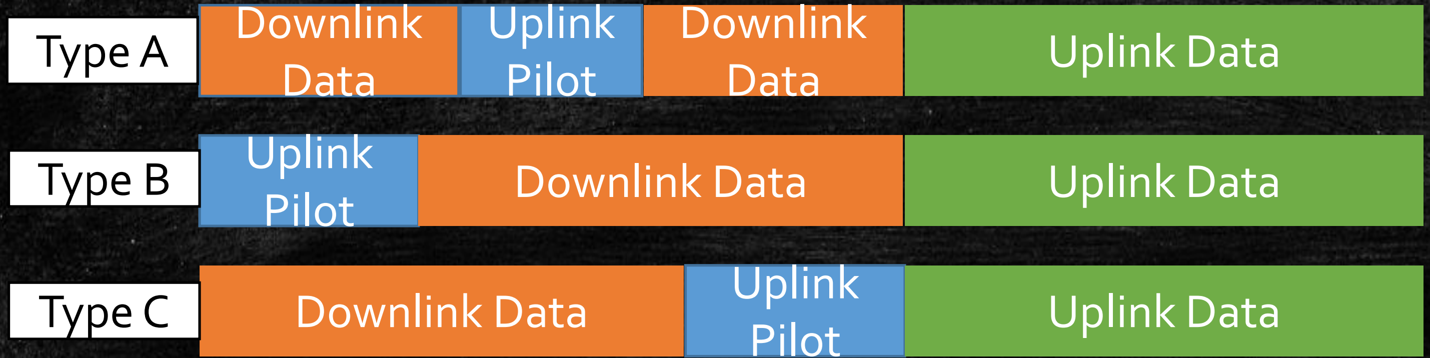
- The problem is modelled to focus on energy efficiency, while taking into account the circuit power consumption of UTs
- The energy efficiency is optimized in terms of mode selection, power allocation and spectrum portioning
- Mode selection is between cellular, dedicated and reuse modes
- The objective function is nonconvex and is made convex by the use of Dinkelbach transformation
- The optimization problem for reuse mode is modified to difference of convex problems and concave-convex procedure is used to solve it.
- The BS is assumed to have perfect CSI for all links

Wideband Spectrum Sensing by Model Order election

- A frequency domain representation of the wideband signal is used
- Case specialized to DFT, because of DFT being used for OFDM
- Ordered vector of the test statistics of the bands being sensed is formed
- The kth hypothesis is the first k components being active
- Model order selection can be used to select the optimal model order
- A generalized information theoretic criterion based on the likelihood function of the received signal is used.
- The criterion is designed to minimize underestimation and keep overestimation under a threshold

Performance of synchronized and unsynchronized pilots in finite massive MIMO systems

- Synchronization of pilots in massive MIMO system leads to pilot contamination
- A solution is to send data in one cell while sending pilots in neighboring cells similar to classical frequency reuse.
- Previous work considers sending pilots in the middle of downlink data. This one mixes uplink pilots and uplink data
- These are shown to be efficient for infinite number of antennas, finite large systems are considered here
- This however results in data to pilot interference
- The main contribution is the analysis of these models
- For low number of UEs downlink data overlap works better and uplink data overlap works better for high number of UES
- Time synchronized pilots are not always the worst case



Energy Harvesting Non-coherent Cooperative Communication

- Studies simultaneous power and information transfer in wireless relay systems
- The transmitter and the receiver have power sources (battery or mains) relays operate using energy harvesting
- Acquisition of CSI by the relays for decode and forward results in increased power usage at the relays, non-coherent communication proposed as a solution
- M-DPSK and M-FSK are used
- ML-Detectors for both time and power splitting based SWIPT are derived
- Exact error expression for transition error probability of DPSK is also developed and is stated to be a byproduct.

Other Interesting Papers

- Zhao, Y.; Li, Y.; Cao, Y.; Jiang, T.; Ge, N., Social-Aware Resource Allocation for Device-to-Device Communications Underlaying Cellular Networks
- Jin, S.; Tan, W.; Matthaiou, M.; Wang, J.; Wong, K., Statistical Eigenmode Transmission for the MU-MIMO Downlink in Rician Fading
- Chiong, C.W.R.; Rong, Y.; Xiang, Y., Channel Estimation for Time-Varying MIMO Relay Systems,"
- Pourgharehkhan, Z.; Taherpour, A.; Sala-Alvarez, J.; Khattab, T., Correlated Multiple Antennas Spectrum Sensing Under Calibration Uncertainty
- He, P.; Zhao, L., Solving a Class of Sum Power Minimization Problems by Generalized Water-Filling
- Lim, Y.; Chae, C.; Caire, G., Performance Analysis of Massive MIMO for Cell-Boundary Users
- Nadeem, Q.; Kammoun, A.; Debbah, M.; Alouini, M., 3D Massive MIMO Systems: Modeling and Performance Analysis
- Liu, P.; Gazor, S.; Kim, I.; Kim, D.I., Noncoherent Relaying in Energy Harvesting Communication Systems
- Zhou, W.; Wu, J.; Fan, P., High Mobility Wireless Communications With Doppler Diversity: Fundamental Performance Limits
- Li, X.; Zhou, S.; Bjornson, E.; Wang, J., Capacity Analysis for Spatially Non-Wide Sense Stationary Uplink Massive MIMO Systems