Massachusetts Institute of Technology
6.888: Wireless Communications Systems
Professor: Dina Katabi

October 8, 2013

Mini-Assignment 4: MegaMimo

(Due : Thursday, October 10 , 2013 @ 3pm)

True or False:

False 1. In the paper JMB: Scaling Wireless Capacity with User Demands, to synchronize independent transmitters, JMB continously tracks and corrects the frequency offsets across the packets sent by the two transmitters.

Why ? *You have to track and correct the accumulated phase rotation resulting from the frequency offsets rather than the frequency offsets themselves.*

False 2. In the paper JMB: Scaling Wireless Capacity with User Demands, the authors show how to synchronize M independent APs in order to deliver M packets concurrently to M independent clients on the downlink. The same sychronization scheme can be used to synchronize the clients and deliver M packets to M APs on the uplink.

Why ? *Unlike the APs the clients are not connected via an ethernet backbone and hence do not have access to each other's data. So even if they synchronize they still cannot transmit* $H^{-1}T(t)^{-1}[x_1x_2...x_n]^T$.

False 3. In the paper JMB: Scaling Wireless Capacity with User Demands, in Figure 9, the authors show that you can scale the throughput linearly with the number of AP-client pairs up to 10 pairs. The trend however does not continue when the gain exceeds an order of magnitude.

Why ? *False but we will also accept True. The paper makes the point that the trend will not continue forever due to errors in synchronization. However, there is no reason to assume that the trend will not continue beyond* $10\times$.

False 4. In the paper JMB: Scaling Wireless Capacity with User Demands, if we have M APs and M clients then each AP must synchronize with the other $M-1$ APs in order to deliver M packets to the M clients concurrently.

Why ? *Each AP only synchronizes with the lead AP rather than all the remaing APs*