Ph: 9585554590, 9585554599
Email: support@salemsmartreach.com
URL: www.salemsmartreach.com

Backhaul Rate Allocation in Uplink SC-FDMA Systems with Multicell Processing

Abstract:

For a cellular system where mobile terminals transmit in the uplink to base stations (BSs) using single carrier-frequency division multiple access (SC-FDMA), we consider multicell processing among BSs. Received signals are first quantized on a per-subcarrier basis and then forwarded to the serving BS on a backhaul with limited rate. With the aim of maximizing the network throughput we a) design an efficient composite signal representation and b) propose a rate allocation algorithm for the backhaul. Using a closed-form expression of the achievable throughput in the presence of quantization noise, an iterative greedy algorithm for the backhaul rate allocation is developed, where at each iteration we select the signal to be exchanged as the one providing the maximum network throughput increase per backhaul bit. In order to determine how many quantization bits are used for each received signal, we consider either a static bit allocation with a fixed number of bits, or a dynamic bit allocation (which ensures a predetermined network percentage throughput loss with respect to the unquantized case). In an LTE scenario, it is seen that the proposed bit allocation methods flexibly adapt to channel and backhaul conditions and yield similar performance, hence the static approach is preferred due to its lower complexity.