

Olav Tirkkonen, Aalto University, School of Electrical Engineering, Espoo, Finland.

Radio resource management for small cell networks

Massive small cell deployments with universal frequency reuse provide a promising avenue to cope with the growing demand of mobile data in hot spot areas of wireless networks. Small cell deployments need to be scalable, and they may have to cope with limited backhaul. As a consequence of low user densities, the state of a cell may be dominated by a small number of users. Accordingly, more diverse network conditions may have to be coped with than in wide area networks. In this talk the consequences of these characteristics of small cell networks are explored. Scalability leads to requiring self-organization features from the networks, favoring distribution of network algorithms to the base stations. Low user densities open up for the possibility to optimize the network for the current set of active users. For this, dynamic distributed interference management is considered, where power, spectrum usage, and beamforming may be coordinated between cells. Furthermore, to cope with backhaul constraints, self-backhauling between small-cells, based on in-band relaying, becomes a viable option. In this context, significant gains can be achieved by applying full-duplex base stations.