

NEXT GENERATION HETEROGENEOUS WIRELESS NETWORKS

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LECTURE: 10:00 AM – 12:00 PM

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Abstract: Driven by a new generation of wireless user equipment and bandwidth-intensive applications, user data traffic and network load are increasing in an exponential manner, and are straining current cellular networks to a breaking point. Heterogeneous networks (HetNets) are seen as the most promising solution to this capacity crunch problem; they consist of a mix of macrocells, remote radio heads, and low-power nodes such as picocells, femtocells, and relays. Through bringing the access network closer to the end users, HetNets have the potential to provide the next significant performance leap in wireless networks, improving spatial spectrum reuse and enhancing indoor coverage. Nevertheless, deployment of a large number of small cells overlaying the macrocells introduces several new technical challenges. After a general overview of HetNets in the context of 3GPP standardization, this talk will cover two particular important challenges for HetNet deployments: enhancement and theoretical analysis of 1) spectral efficiency, and 2) mobility performance. Our analyses provide important insights on how to capture the gains proposed by HetNet deployments, without victimizing disadvantaged users in the network. In addition to a detailed coverage of HetNets, the speaker will also provide a high level overview of some other research activities in his group, including green cellular networks, filterbank multicarrier systems, and indoor localization.

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