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Random Access Protocols for Massive MIMO

Prof. Dr. Elisabeth de Carvalho
Aalborg Universität, Dänemark

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Diskussionsleitung: Prof. Dr.-Ing. R. Müller

5G wireless networks are expected to support new services with stringent requirements on data rates, latency and reliability. One novel feature coming with 5G is the ability to serve a dense crowd of devices, calling for radically new ways of accessing the network. This is the case in machine-type communications, but also urban environments or hotspots. In those use cases, pilot sequences are in shortage as the number of devices is much larger than the sample duration of the channel coherence interval. In this presentation, we motivate the need for random access to pilot sequences by the devices and shows that massive MIMO is a main enabler to achieve fast access with high data rates, and delay-tolerant access with different data rate levels. Two pilot access protocols along with data transmission protocols are described, fulfilling different requirements of 5G services.