TECHNISCHE FAKULTÄT

Department Elektrotechnik-Elektronik-Informationstechnik

EEI-KOLLOQUIUM

Resource Allocation for Future Wireless Systems

Dr. Martin Schubert
Fraunhofer German-Sino Lab for Mobile Communications MCI, Berlin

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

Next generation wireless communication networks are expected to support high-rate services for a large number of users. However, interference between users puts a hard limit on the achievable performance. So current standardization programs e.g. 3GPP LTE Advanced) are investing much effort in developing new strategies for efficiently distributing the available resources, while avoiding interference by dynamic scheduling and MIMO processing. The classical design paradigm of independent point-to-point communication links is gradually being replaced by a new network-centric approach, where users cope with interference in an adaptive fashion. New mathematical tools are required for such cross-layer optimization problems.

Many previous results in the area of adaptive interference filtering and robust signal processing can be understood within the general framework of interference functions. This abstract mathematical approach is based on on some core properties, like ``monotonicity'' and ``convexity''. The simplicity of this approach allows for an analytical treatment of problems which are otherwise too complicated to handle. At the same time, the framework offers enough structure to allow for interesting analytical opportunities. As application examples, strategies for joint resource allocation and interference mitigation are discussed.

Friedrich-Alexander-Universität Erlangen-Nürnberg