

Subject: Resource Allocation for Corridor-based routing in multi-hop networks

**Research Focus/
Cross-sectional Area:** R9) Communication systems

Description:

Topic of the thesis is the resource allocation in multi-hop networks. Particularly, a specific routing paradigm referred to as corridor-based routing is assumed where a routing path from the source node to the destination node is widened to span multiple nodes per hop to introduce flexibility and spatial diversity. The widened path and each widened hop are called corridor and stage, respectively. In such networks, the discrete resources available are the frequency carriers and the time slots. The transmit power is a continuous resource. The discrete and continuous resources have to be allocated to the radio links in each hop with the optimization goals of maximizing the system capacity or minimizing the overall transmit power. This can be formulated as a mixed discrete and continuous optimization problem. Simple and efficient algorithms for resource allocation have to be found, also allowing decentralized resource allocation in multi-hop networks. For further information on the context of this topic, cf. also <http://www.kt.tu-darmstadt.de>.

Requirements:

Excellent Diploma or MSc in EE & IT or related area; excellent background in communications engineering, signal processing, mathematics, programming and simulation in Matlab, C++; good knowledge of German and English languages

Supervisors: A. Klein, Communications Engineering,
M. Pfetsch, Discrete Optimization

