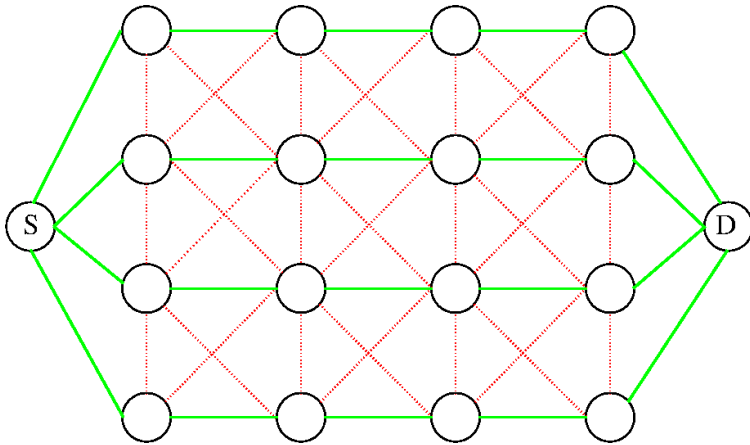


**Subject:** Cross-Layer Optimization in Wireless Multihop Networks

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



**Description:**

Topic of the thesis is the design of a Cross-Layer Framework for wireless multihop networks. The system performance of a wireless multihop network is influenced by the interdependency between the layers. The network layer determines the end to end route that a packet traverses through the network, which on the physical layer is seen as a power allocation and interference mitigation problem. The complexity of the problem increases when the resources allocation and scheduling on the data link layer is introduced. The problem can be formulated as a mixed integer problem with multiple non-linear constraints. The problem has to be formulated and solved in an optimal way. Furthermore, simple and decentralized algorithms should be developed. 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 and mathematics; excellent background in programming and simulation in Matlab, C++; good knowledge of German and English languages

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