# Illinois Center for Wireless Systems

## ICWS Seminar Series

### Security in Infrastructureless and Decentralized Communication Networks - Possibilities, Results and Evaluation Challenges

Professor Andre Koenig
Multimedia Communications Lab (KOM)
Technische Universitaet Darmstadt
http://www.kom.tu-darmstadt.de

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Room 3124 Seibel Center

**Abstract:**
Infrastructureless and decentralized communication substrates such as mobile ad hoc networks and peer-to-peer systems enable setting up communication services beyond the borders of contemporary wired or cellular client/server systems. Yet, due to their specific characteristics like wireless multihop data transmission and lack of central trusted instances, infrastructureless and decentralized networks are also beyond the protection of contemporary security mechanisms. This especially requires consideration in possible first responder or military application scenarios. Various new threats targeting each layer of the ISO/OSI model have been identified. Central questions regarding security include how to deal with misbehavior and how to protect information in networks without well-defined borders, consisting of devices, services and users from multiple administrative domains.

In this talk we present possible solutions for excluding misbehaving nodes from infrastructureless networks to recover the availability of the network in presence of attacks. We further present mathematical tools for governing cooperative decision processes without central trusted instances as basis for security objectives such as authentication and access control in decentralized systems. We show evaluation results based on analytical models as well as simulation and testbed studies and highlight general challenges regarding the evaluation of protocols and algorithms for infrastructureless decentralized communication networks.