



## Implementation and Evaluation of Mobility Models with OPNET

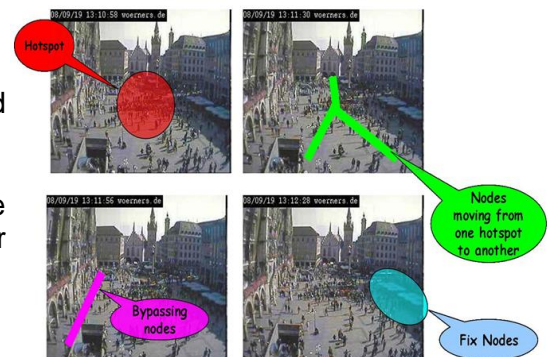
### Motivation

The increasing number of mobile devices (e.g. smart phones) increases the demand for mobile wireless solutions in order to improve the network performance and thus the quality perceived by the users. Communication protocols behave differently depending on the mobility of the users in the network. Realistic mobility models are required as input for simulation to allow a meaningful comparison of different protocols. A large number of synthetic mobility models have been introduced in the last few years. However, most of them have either unwanted characteristics or are too complex to be simulated within a justifiable period of time if the number of nodes increases. In this thesis, you will take a look at the most popular synthetic mobility models. The models will be evaluated in terms of node distribution, speed distribution, transient phase, link duration, and correlated movement. Furthermore, you will implement group mobility models which consider the movement of other nodes and obstacles in order to create realistic movement.

### Your Task

Your task consists of the following steps.

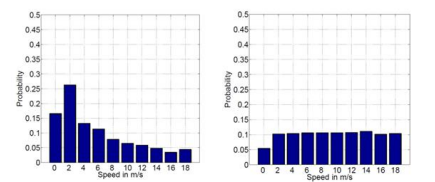
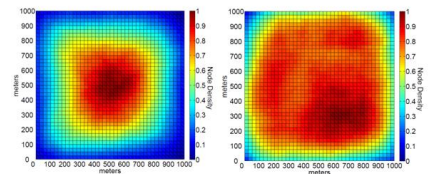
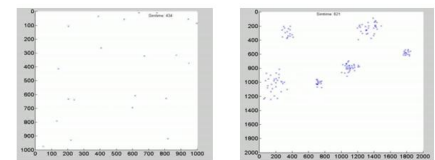
- 1) Get familiar with the OPNET modeler and the existing mobility framework
- 2) Add the functionality to simulate mobile obstacles that block movement and/or signal propagation
- 3) Implement additional mobility models
- 4) Evaluate the generated movement of the synthetic mobility models and outline their impact on the communication in multi-hop wireless networks



Depending on the project's scope, this part will be more (MSc, Diplom) or less in depth (BA)

### Requirements

Previous knowledge of communication issues and Discrete Event Simulation (DES) is useful but not required since you will be provided with the corresponding information and tutorials. The simulation will be written in C. Thus, some knowledge of C will give you a clear advantage.



### Keywords

**Mobility, Simulation, Wireless, Network**

