

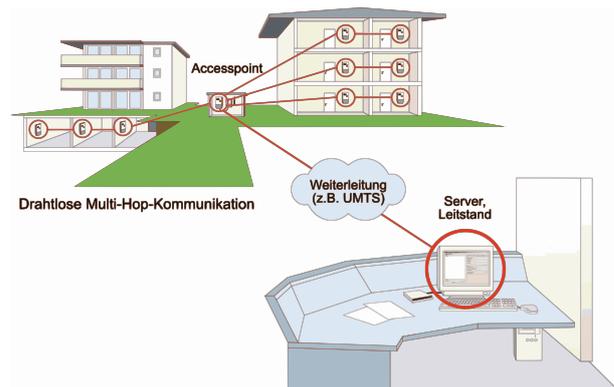
# Bachelor's Thesis

## « Generating Realistic Node Placements for the Simulation of Wireless Smart Metering Networks »

### Background

Within the iEZMesh project, a self-organizing wireless mesh network for smart metering applications is developed. To evaluate and test protocols within the expected multi-hop networks of thousands of nodes, simulations are carried out using the OMNeT++ simulation engine and the MiXiM framework.

One prerequisite to run meaningful simulations is to create realistic network topologies. In real wireless smart metering networks, node locations are expected to follow rather strict patterns, e.g. nearly all meters are located within buildings and are often deployed in cellars near each other. Therefore, using simple grid or randomly distributed nodes does not yield very realistic topologies and can render simulation results inaccurate.



### Work description

This project work or Bachelor's Thesis therefore aims at solving this issue by developing a parametrizable topology generator which creates realistic networks from geographic information. To achieve this aim, data from real geographic dataset(s) has to be evaluated, useful information has to be extracted and a concept for the conversion of the gathered data into a network topology has to be created. Possible candidates to be used as sources/formats are e.g. OpenStreetMap or CityGML. Finally the results should be integrated into the MiXiM framework.

During the work, the following tasks shall be carried out:

- Investigation of possible sources and data formats for the desired geographic information
- Analysis of available data and Development of a concept to derive number and position of meters from the data
- Implement a parametrizable topology generator and integrate it with the simulation environment

### Prerequisites

- Solid knowledge of a suitable programming language
- Familiarity with XML is (most likely) helpful
- Interest in the proposed topic and commitment to the project

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