

# Master's Thesis

## « Middleware for Wireless Sensor Networks »

### Motivation

On sensor nodes, programming is often not straight forward. Within wireless sensor networks (WSN) all underlying layers, i.e., transport, routing, and MAC, have to be programmed. In contrary to conventional distributed systems, where only the application layer has to be developed. Therefore, different middleware solutions have been derived to help developers.

The TOLERANCEZONE project will implement a middleware for WSNs, it will furthermore use self-stabilizing techniques to greatly enhance fault-tolerance of such systems. To show that ToleranceZone is at least as powerful as other middlewares is also part of the development process.

### Work description

The main task of the proposed thesis, will be the implementation of a middleware for the OMNeT++ simulation environment, with the functionality of TeenyLIME. TeenyLIME is a middleware for programming with TinyOS, it is written in NesC.

The goal of this thesis is to compare TeenyLIME and ToleranceZone. This will be an important asset to the ToleranceZone project. Furthermore, the design of an API for tests of single parts of the ToleranceZone architecture, compared to the corresponding TeenyLIME parts, is also part of the thesis.

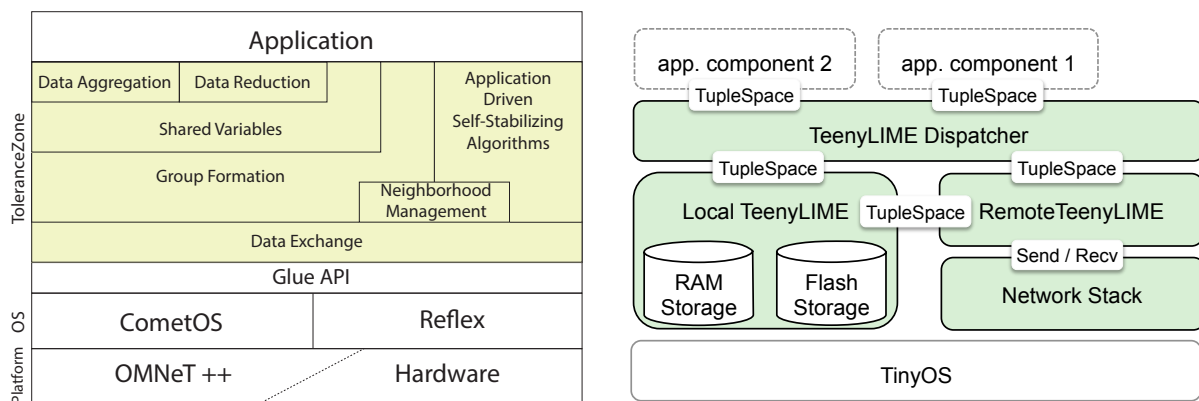


Figure 1: ToleranceZone and TeenyLime architecture

### Requirements

- Fundamental programming skills, preferably in C++
- Basic knowledge about distributed systems (4th semester course)

**Contact: Gerry Siegemund**

[gerry.siegemund@tu-harburg.de](mailto:gerry.siegemund@tu-harburg.de)

Phone: +49 40 / 428 78 – 3448

Room: E 4.077