ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

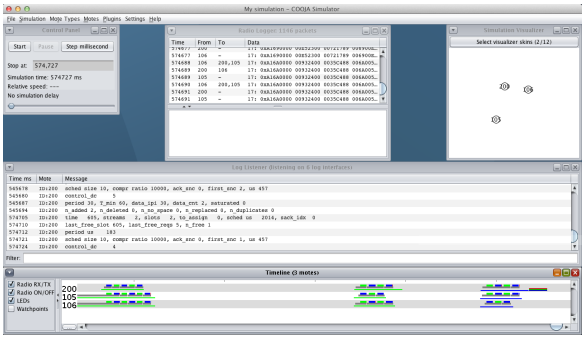
TIK
Institut für Technische Informatik
und Kommunikationsnetze
Computer Engineering and
Networks Laboratory

Prof. L. Thiele

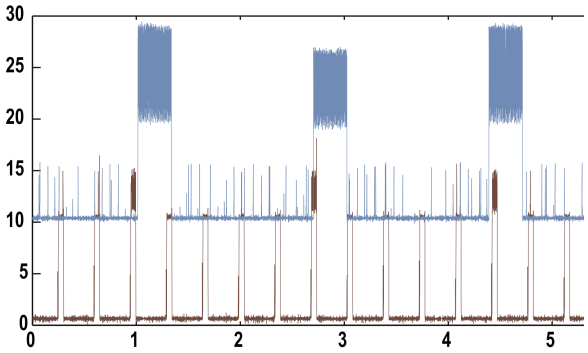
Semester / Bachelor / Master Thesis:

Making Sense of FlockLab Testbed Data

A wireless sensor network (WSN) is a distributed system consisting of tiny devices equipped with a wireless radio. Inherent constraints of these devices in terms of energy, bandwidth, memory, and processing present significant challenges to the realization of real-world applications. To support the development process, over the past three years our group has been setting up a cutting-edge testbed called FlockLab, giving users the chance to evaluate and debug their applications on real hardware.



(a) Cooja with visualizations of a simulation. The *Timeline* plugin at the very bottom displays packet transmissions and receptions in the network



(b) Power traces of two sensor nodes.

While FlockLab is an indispensable tool for successful WSN application and protocol development, already a single, short test run can produce massive amounts of test data, typically in the order of hundreds of megabytes. To help developers understand and make use of this large debug information, the goal of this thesis is to develop a tool for visualizing and interactively replaying FlockLab test data traces post factum. This tool shall take the form of a software plugin for Cooja, which is a state-of-the-art and widely used WSN simulator implemented in the Java programming language.

The plugin to develop should visualize radio communication events in FlockLab based on recorded test data traces, much like the existing *Timeline* plugin shown in Figure 1(a) does. In addition, also power measurements taken at different nodes simultaneously (Figure 1(b)) should be displayed.

Requirements: For this thesis you should have good Java programming skills and be interested in working with large data sets.

Project web page: http://www.flocklab.ethz.ch/

Interested? Please contact us for more details!

Contacts

- Roman Lim: roman.lim@tik.ee.ethz.ch, ETZ G82
- Marco Zimmerling: zimmerling@tik.ee.ethz.ch, ETZ G81