Sustainable Communication Networks
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Mobility Traces from GPS Routes

Prerequisites:	- Basic knowledge of OMNeT++ and its mobility models - Good knowledge of web programming tools, like Django, OpenRoute, Heroku
Reccomended background:	- Bonn Motion, databases
Level:	This topic is appropriate for Master Students
Language:	German or English

Introduction

Mobility traces are a common tool for simulating mobility in network simulators, such as the OMNeT++ simulator. They consist of a sequence of coordinates (often only in 2D), which a simulated node can follow.
In this project, we would like to extend an already developed framework, where users can enter their usual movements over a web interface. You can check the app here: https://routemapinfo.herokuapp.com/routemap/home/. The currently stored traces reside in a database and need to be extracted before using them in OMNeT++.

Detailed description

The following tasks need to be executed:

- Familiarise yourself with OMNeT++, BonnMotion and running simulations with mobility traces (Examples are available under the OMNeT++ website)
- Familiarise yourself with the current implementation of the GPS extraction routes on github.
- Implement an "extraction button" in the Admin interface, which extracts the routes of the individual people directly in a BonnMotion file.
- Validate the implementation by entering at least 10 different full days of movement (corresponding to 10 people and 1 day of mobility trace) and running a simulation in OMNeT++ with this mobility trace.

This project can be extended into a master thesis by organising a user campaign with at least 50 people and developing a benchmark scenario for OPS, similar to the ones described here: https://dl.acm.org/doi/abs/10.1145/3458473.3458819. Then, evaluating the benchmark through simulations in OPS with all provided forwarding protocols.

Contact

If you are interested in this work, please contact us via mail: projects@comnets.uni-bremen.de