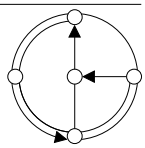
ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich



Prof. Roger Wattenhofer
phone +41 1 632 6312
wattenhofer@tik.ee.ethz.ch

Master/Diploma Thesis: Bidirectional Routing in Mobile Ad Hoc Networks

Subject

Nowadays, we observe a rapid evolution in the world of computing devices. The general trend of this ongoing process is characterized by minimization, mobilization, and fusion into multi-purpose devices. In addition to the small size, also the means to communicate with the outside world is an important enabler for a truly mobile device. Looking at today's (portable) gadgets, they often provide data exchange over Bluetooth, ZigBee, 802.11, or some other protocol. The most prominent example in this field is without doubt the *mobile* phone, which has grown up to a small computing device with dozens of features.

Along with this development came many new usage scenarios, including mobile devices that consume services provided by the environment. In the most general scenarios, some mobile devices join together and are *somehow* able to interact without outside assistance.

Our group has conducted extensive research in this area and developed routing algorithms for mobile ad hoc networks (MANET). However, all of these protocols do not investigate the case of bidirectional routing, where the receiver acknowledges the receipt or sends back an answer. Especially for highly mobile networks, this is a challenge and protocols other than TCP might be more suitable.

In this thesis, you are asked to formally analyze existing bidirectional routing protocols and suggest improvements or design your own protocol. Your work will be closely tied to the existing routing algorithms for MANETS. Georouting is the most prominent candidate and has worst-case delivery cost of $O(d^2)$, where d is the length of the optimal route. In a first step, you might design a communication scheme with worst case overhead $O(d \log d)$, once a route has been established. In the second part, you'll prove the correctness of your algorithm also for mobile networks, where any node might be dislocating at any time.

Skills

Interest in designing and analyzing algorithms.

Contacts/Advisors

Roland Flury	rflury@tik.ee.ethz.ch	01 632 7028
Roger Wattenhofer	wattenhofer@tik.ee.ethz.ch	01 632 5986