Master Thesis – Mobile positioning Data Anonymization
into public geographical flows

Unit Description
In Ericsson Linköping the PDU Platform (Daniel Jakobsson) cooperate with Ericsson Research locally (Fredrik Gunnarsson) and in Kista (Jan Höller) to develop in praxis for mobile positioning use in open data.

Purpose/background
Open data is becoming a prominent reality in our society where the value reaches its potential when combining different meaningful data sets. Mobile positions are one valuable asset that can be used with open data to better understand spatial and flow aspects of open data. The way you and other people move around is a valuable asset for several actors in the society: the city planner can design pathways and traffic control; the event manager can get an idea about lengths of queues to parking lots; the shop-keeper can design his/her entrance and adapt opening hours. Only your own imagination limits the way to use data about movements. This thesis aims at developing tools for collecting, processing algorithms and analyzing movement data. The goal is that the result will become a demonstrator that will be used to show movement data potential.

Task
Since availability of open data is still limited, the thesis work will is split up into two parts. One part concerns data generation and focuses on an Android (or iOS) app that gathers GNSS and relevant measurements and uploads to a server. The other part concerns data processing and focuses on the server data to merge data from different user trajectories and associate data to map information such as roads.

The scope of the app work can be adapted to ideas of the student. One aspect is to introduce incentives into the app to motivate usage, for example like the Theory of Fun (rolighetsteorin). There is already a database server framework available as open source, but packaging and designing an API to the server for anonymize position data is the valuable contribution.

The scope of the server work is to consider processing means to aggregate user trajectories and simulate movement to compensate for single user identification thereby anonymize them. Furthermore, the aggregated data will be associated to map information such as roads, public places etc. in a designated area of focus. Algorithms shall be developed for classification of moment to indicate traffic types. Depending on time, interesting aspects is also to analyze the data with respect to flows etc. In order to be independent initially from the other part, also generating simulated data can be considered.
Qualifications
For the app part, interest or experience from app programming and application interfaces is very relevant. For the server part, rather general programming and interest or experience of developing algorithms is needed. Additional interest or experiences from web programming and Matlab can be valuable.

Extent; Masters Level, two full time students at 30 hp
Apply before: January 2014
Preferred starting date: January 2014

NOTE 1 CityPulse

NOTE 2 Linköping Kommun öppen data

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