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Bachelorthesis (Jahr 2014)
Study and implementation of a location-based and preference-aware Recommendation System in New York City based on social network data

Keywords
Recommendation Systems, Location Based Social Networks, PostGIS, QGIS

Synopsis

Due to progress in location-acquisition and technologies linked to mobile devices in recent years, users of mobile devices are enabled to add a new dimension to traditional social networks: *the location*.
Location based social networks offer users the possibility to share impressions on visited locations with an online community. For instance, a user can comment on a museum in a LBSN site, so that the people from his social structure can refer to the comment when they visit the same museum at a later point of time.
The location-history of a user implies extensive knowledge about the individuals' interests, preferences, and most of all his behaviour. By this means, the information is providing analysts with opportunities to better understand the user not only based on his online behaviour, but also his activities in the real world.

The aim of this project is to develop a location based and preference aware Recommendation System, which is based on user and item related data from the LBSN Foursquare. The data is stored in a PostgreSQL database. PostGIS extends the database, therefore spatial analysis, such as, transformations, point-in-polygon-queries, etc. can be performed. The system is developed in C#. The program uses NPGSQL as database connectivity. The recommendation system is embedded in a plug-in for QGIS.
Four recommendation algorithms are implemented:

- Best Rated
- Community Based
- Content Based
- Collaborative Filtering

They are tested and evaluated with the NYC-dataset from Foursquare.

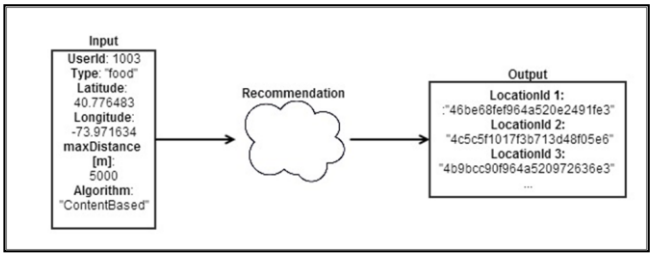

Figure 1 shows the simplified concept of the process.

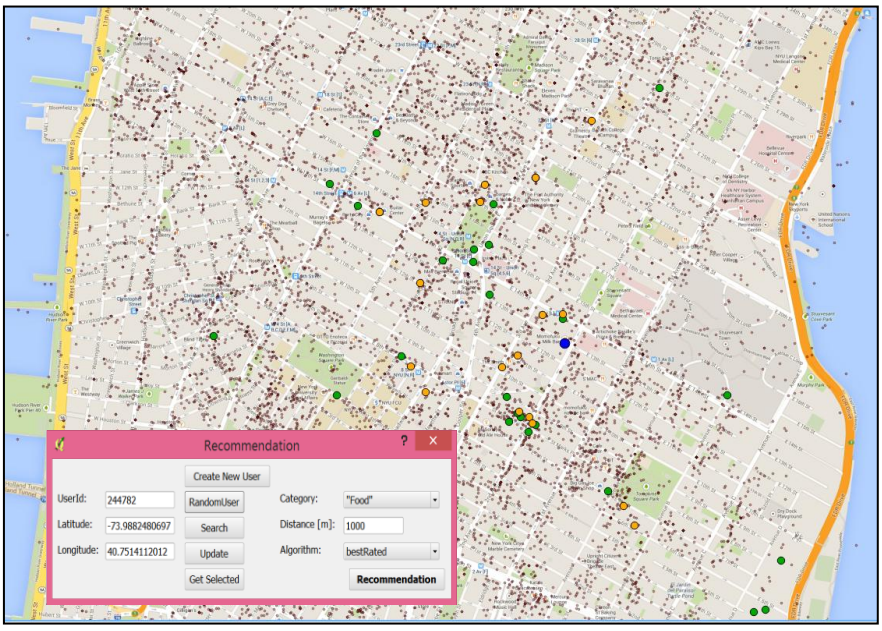

Figure 2 shows the deviation of recommendations and visited locations for user 1977211 in QGIS and the interface of the plug-in. The User-location is the blue point in the center. Visited Locations are represented by green points. Recommended locations are orange. Locations are visualized in red, slightly transparent and with smaller points.