



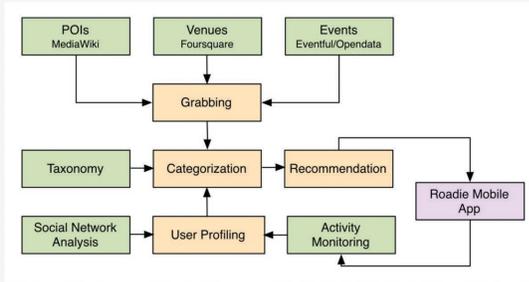
# ROADIE Mobile Semantic Tourism Routes

## INTINERARY RECOMMENDATION IN SMART CITIES

**Roadie** is a mobile electronic guide for Personalized Recommendation of itineraries in Smart Cities through Social Network Profiling and User Activities Monitoring.

Roadie main goals are:

- to provide tourists with a smart semi-automatic tool to build itineraries through city POIs;
- to **profile** users through **social network analysis** and mobile devices' **sensors data monitoring**;
- to **suggest events**, according to user's interests, in order to enrich itineraries.



### Data collection and categorization

Roadie uses two types of **geo-localised data**:

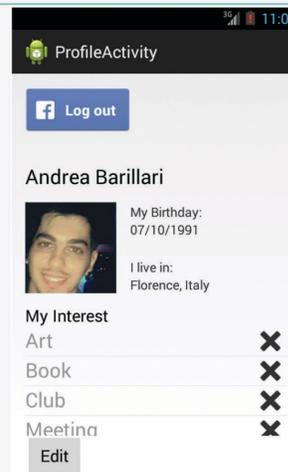
- **static data**: city attractions in Florence retrieved querying the MediaWiki API
- **dynamic data**, mainly constituted by events, and obtained from the OpenData published by the municipality of Florence, IT and the Eventful API which offers user-generated data and concerns, for the most, musical events and shows.

Roadie adopts a **taxonomy** of 19 macro categories in order to exhaustively represent both user interests and venues/events. Data continuously updated from heterogeneous sources are analysed in order **to be mapped** to the system's taxonomy items. The correlation is estimated using a semantic text similarity technique based on distributional similarity and **Latent Semantic Analysis**, complemented with semantic relations extracted from WordNet.

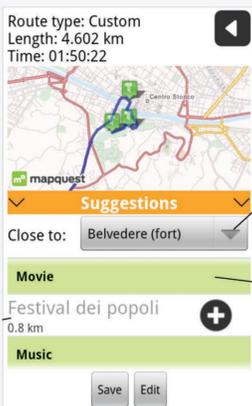
### User Profiling

User profiling is done through:

- **social network analysis** (i.e. identifying categories of user 'likes' through the Facebook Graph API);
  - **inferences of common interests** between similar users using demographic info;
  - **detection** of physical activities through mobile device sensors data monitoring (i.e. running, sightseeing)
- Speed of user's movements** between geographic positions is monitored in order to estimate running/jogging activity.
- Altitude peaks** are analysed by a probabilistic model to assess a user preference for climbing and panoramic views.



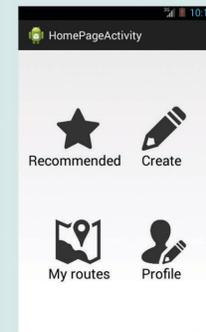
### Recommendation



Recommendation of routes is based on **geographic position**, **online profile of interest**, and **preferred user activities** detected from device sensors. Recommended routes are built through the **MapQuest Route Service** trying to maximise the ratio between the number of attractions to visit and the available time.

**Venues, places and events** with the highest semantic similarity to the user profile of interests are categorised and suggested, ordered by distance from the user.

## App Interface design



Roadie is a native mobile application developed in java using the **Android SDK**. The interface is composed by **four main views**: 1) recommended routes; 2) route creation; 3) profile and 4) saved routes.

Roadie features **Facebook Login** as well as app registration.

The **profile view** shows demographic infos and all the automatically detected interests. Data can be edited adding or removing items from the system taxonomy. The **recommended routes view** provides a scrollable list by which the user can select different thematic itineraries on the basis of his/her interests. Recommended routes can be edited manually directly on the map or users can utilise the **route creation view** to plan their visit from scratch. To this end Roadie provides smart suggestion mechanisms to enrich the route with venues and events relevant with user interests and POIs he/she has planned to visit (this is achieved using social network analysis, activity detection through mobile sensors data for users and resources categorisation and textual semantic analysis for category matching and recommendation)

