

RESEARCH SUBJECT TITLE: Social networks and participatory information for the recommendation of tourist itineraries

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Abstract:

Today, with initiatives such as crowdsourcing or voluntary or participatory information (Wikipedia, OpenStreetMap, Mechanical Turk, etc.) on the one hand, the growth of social networks (Facebook, Tweeter, Instagram, Pinterest, Foursquare, etc.) on the other hand, supported by ubiquitous technologies, making information available from everywhere and at any time on a variety of devices connected to Internet (computer, tablets, smartphones, etc.), it is possible to collect, store, access or analyze ever-increasing volumes of data, information and knowledge.

Thus, while social networks make it possible to better (make) know individuals or groups of individuals, other applications such as Wikipedia, OpenStreetMap, Mechanical Turk allow to collect from voluntary citizens general or specific knowledge on a variety of topics.

This Ph.D. thesis aims to explore how social networks and various sources of participatory information can be exploited (i.e. collected, retrieved, analyzed, etc.) for the purposes of recommendations of personalized itineraries. Personalization is materialized here by the notion of user profile, that is, an evolutionary set of knowledge, accessible or accumulated over time, either directly (i.e. provided by the user him or herself) or indirectly (collected from the exploitation – supposedly authorized – of the “traces” that the user leaves on different applications that he or she uses), that informs about his or her marital status, his or her family situation, his or her professional preferences to leisure (travel, reading, cinema, etc.) or habits in all sorts of things...

The chose framework will be that of itineraries carried out in the context of leisure, in particular tourist itineraries.

More specifically, the question addressed here will be whether, from the information gathered and available about an individual through his/her profile on one side, and the

impressions, opinions, comments, information, knowledge available today through social networks and/or various sources of participatory information, from the other side, it is possible to recommend him/her a tourist route for a future destination (region/city/place...), known or unknown to him, which takes into account 1) his/her preferences (in terms of remarkable monuments or sites, but also transport, hotels, restaurants, etc.) and POIs (points of interest) of the site to be visited, confronting them with general or specific opinions, knowledge from participatory sources of information; and/or 2) itineraries recommended or followed in this place by other individuals, friends or unknowns, whose preferences, tastes, experiences are considered as similar?

Some preferences of the user can appear as circumstantial. So, it will also be a question of taking into account in the elaboration of the route to be planned, the possible underlying constraints, in particular budgetary and/or temporal. The chosen approach will be the following one: the Ph.D. candidate will have to propose a model of the user profile, which takes into account various useful characteristics of the user with the prospect of the elaboration of a tourist itinerary concerning him/her. This model will be instantiated by diverse information supplied by the user but also by information collected through diverse social networks in which he/she participates. Questions of reliability and confidentiality are to be addressed here.

At the same time, the aim will be to identify participatory sources of information including the most popular social networks, which will provide advice on the proposed itinerary. Here, there are questions about the availability of this data, confidentiality, and reliability. Then, the data available on the user's side and collected from the sources of participatory information will have to be confronted in order to be able to recommend to the user the elements of his/her tourist itinerary (in terms of transport, housing, catering, points of interest, site to visit, etc.) considered the most popular by other people whose preferences for tourist itineraries are similar. It will therefore be necessary to define which existing similarity methods, to be designed or adapted, allow a satisfactory recommendation.

An implementation that can be considered as a proof of concept is expected.

References:

The references below constitute interesting avenues of investigation and a first proposal for a state of the art.

- Daniele Quercia, Rossano Schifanella, Luca Maria Aiello: The shortest path to happiness: recommending beautiful, quiet, and happy routes in the city. HT 2014: 116-125
- Luca Maria Aiello, Rossano Schifanella, Daniele Quercia, Francesco Aletta: Chatty Maps: Constructing sound maps of urban areas from social media data. CoRR abs/1603.07813 (2016)
- Shoko Wakamiya, Hiroshi Kawasaki, Yukiko Kawai, Adam Jatowt, Eiji Aramaki, Toyokazu Akiyama: Lets not stare at smartphones while walking: memorable route recommendation by detecting effective landmarks. UbiComp 2016: 1136-1146
- Daniel Preotiuc-Pietro, Justin Cranshaw, Tae Yano: Exploring venue-based city-to-city similarity measures. UrbComp@KDD 2013: 16:1-16:4
- Makoto P. Kato, Hiroaki Ohshima, Satoshi Oyama, Katsumi Tanaka: Search as if you were in your home town: geographic search by regional context and dynamic feature-space selection. CIKM 2010: 1541-1544

- Rohan Seth, Michele Covell, Deepak Ravichandran, D. Sivakumar, Shumeet Baluja: A Tale of Two (Similar) Cities - Inferring City Similarity through Geo-spatial Query Log Analysis. KDIR 2011: 179-189
- André Sales Fonteles : A Generic Architecture and a Recommendation Strategy for Spatial Crowdsourcing Platforms, Ph.D. Thesis, Université Grenoble Alpes, 2017
- André Sales Fonteles, Sylvain Bouveret, Jérôme Gensel: A programming framework for Spatial Crowdsourcing. MoMM 2017: 131-140
- Diana Nurbakova : Recommendation of Activity Sequences during Distributed Events, Université de Lyon, 2018
- Diana Nurbakova, Léa Laporte, Sylvie Calabretto, Jérôme Gensel: Recommendation of Short-Term Activity Sequences During Distributed Events. ICCS 2017: 2069-2078
- Massimo Quadrana, Paolo Cremonesi, Dietmar Jannach: Sequence-Aware Recommender Systems. ACM Comput. Surv. 51(4): 66:1-66:36 (2018)
- Chenyi Zhang, Hongwei Liang, Ke Wang, Jianling Sun: Personalized Trip Recommendation with POI Availability and Uncertain Traveling Time. CIKM 2015: 911-920
- Einat Minkov, Ben Charrow, Jonathan Ledlie, Seth J. Teller, Tommi S. Jaakkola: Collaborative future event recommendation. CIKM 2010: 819-828
- Silvia Rossi, Francesco Barile, Clemente Galdi, Luca Russo: Recommendation in museums: paths, sequences, and group satisfaction maximization. Multimedia Tools Appl. 76(24): 26031-26055 (2017)
- Pieter Vansteenwegen, Wouter Souffriau: Trip Planning Functionalities: State of the Art and Future. J. of IT & Tourism 12(4): 305-315 (2010)
- Damianos Gavalas, Charalampos Konstantopoulos, Konstantinos Mastakas, Grammati E. Pantziou: A survey on algorithmic approaches for solving tourist trip design problems. J. Heuristics 20(3): 291-328 (2014)

Expected duration of the thesis: 36 or 48 months

Keywords: recommendation, social networks, participatory information, similarity, user profile, tourist itineraries