LocalRec'15: Workshop on Location-Aware Recommendations

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ABSTRACT

The amount of available geo-referenced data has seen a dramatic explosion over the past few years. Human activities now generate digital traces that are annotated with location data, enabling the collection of rich information about people's interests and habits. This torrent of geo-referenced data provides a tremendous potential to augment recommender systems. The LocalRec'15 workshop brings together scholars from location-based services and recommender systems, and seeks to set out new trends and research directions.

Categories and Subject Descriptors

H.3.3 [**Information Storage and Retrieval**]: Information Search and Retrieval—*Information Filtering*

General Terms

Algorithms, Design, Experimentation

Keywords

recommender systems; location-based services

1. MOTIVATION

Driven by technological advances in hardware (positioning systems, environmental sensors), software (standards, tools, network services), and aided by various open movements (open, linked, government data) and the ever-growing trend of sharing for the greater good (crowdsourcing, crowdfunding, collaborative and volunteered geographic information), the amount of available geo-referenced data has seen dramatic explosion over the past few years. Human activities

generate data and traces that are now often transparently annotated with location and contextual information. At the same time, it has become easier than ever to collect and combine rich and diverse information about locations. Exploiting this torrent of geo-referenced data provides a tremendous potential to materially improve existing and offer novel types of recommendation services, with clear benefits in many domains, including social networks, marketing, and tourism.

Fully exploiting the potential of location-aware recommendations, requires addressing many core challenges and combining ideas and techniques from various research communities, such as recommender systems, data management, geographic information systems, social network analytics, and text mining. Bringing together scholars and practitioners from these communities, the aim of the LocalRec'15 workshop was to provide a unique forum for discussing in depth and collecting feedback about the challenges, opportunities, novel techniques and applications of location-aware recommendations, in order to fuel better and novel recommender systems beyond the current research frontiers.

The non-exhaustive list of topics relevant to LocalRec'15 was the following.

- Location-based social networks
  - friend/communities recommendations
  - event, venue, and other location-aware recommendations
  - extracting preferences, tips, ratings, patterns, habits
  - modeling geo-social influence of users and locations
- Location-based marketing
  - viral campaigning
  - event planning
  - location-based advertising
- Tourism and mobile commerce
  - trip planning and recommendations
  - automatic guide and tour generation
  - exhibition arrangement
- Evaluation of location-aware recommender systems
  - collaborative filtering vs. content-based recommendations
  - case and empirical studies
  - evaluation methods and metrics
  - datasets and benchmarks
- Security and privacy implications

– spatial anonymization and cloaking
– attack and threat scenarios

Further information can be found at the website of the LocalRec'15 workshop.[1]

2. WORKSHOP PROGRAM

We received ten submissions and we selected seven papers that are shortly summarized in the following.

Del Carmen Rodríguez-Hernández et al. [2] survey location-aware recommender systems (LARS). The authors describe LARS as a kind of context-aware recommender system that focuses on the spatial properties of the items that can be recommended; they discuss a number of studies that have been published, categorizing them as domain-independent (i.e., about generic spatial-ratings) and domain-dependent (recommending POIs, tourist routes, news, and shopping). The authors close with a comprehensive table of open challenges in this domain, that range from acquiring location data, evaluation, and security issues.

Giannopoulos et al. [3] present an approach to the recommendation of categories for geospatial entities annotation that leverages knowledge of previously annotated entities. They identify features that represent geospatial entities and capture their relation with the categories they are annotated with. These features involve spatial and textual properties of the entities. They evaluate two different learning approaches (SVM and kNN) and show that the best algorithm (SVM) can generate high precision category recommendations.

Kumar et al. [4] argue that close geographical distance does not necessarily imply increased similarity in users' preferences. This reasoning is in contrast to popular location-aware recommender systems that assume similarity decreases with distance. In the movie domain, the authors find that nearby locations are more similar than slightly more distant one, but average similarity does not generally decrease as distance increases. In fact, there are many cases where the average similarity of locations separated by thousands of kilometers exceeds the average similarity of nearby locations. Therefore, their approach is to cluster users taking into account the similarity, instead of the proximity, of their locations, which leads to accuracy improvements compared to proximity-based and randomized clustering.

Lamche et al. [5] design a context-aware recommendation system for mobile shopping. The goal is to employ user's mobile context for recommending clothing items in shops close to her position. Compared to existing mobile recommender systems, the challenge is to deal with frequent updates on the items list. The proposed framework extends a critique-based recommender system with a pre and a post-filtering stage. During pre-filtering, items relevant to the user context are determined based on factors such as the distance to or the opening hours of a shop and time of the day. Post-filtering employs a nearest neighbor algorithm to select the best-fits out of the items returned by the core recommender.

Lu et al. [6] introduce a location recommendation framework providing personalized recommendations. The proposed solution combines results from various recommenders that consider different factors. In a nutshell, the framework estimates, for each individual user, the underlying influence of each factor and aggregates suggestions from different recommenders based on this estimation. The paper shows how to learn individual user preferences over different recommenders and how to aggregate the resulting recommendations.

Palovics et al. [7] present a solution for Twitter hashtag recommendation for users retrieved from a stream of geo-tagged tweets. The proposed solution leverages the combination of local hashtag popularity, geographical hierarchy information and temporal context to learn the Twitter hashtag recommendations online. They use two models to recommend hashtags at a given location, one based on the estimated probability of the hashtag appearance based on its recency, and another based on its temporal popularity. Their proposed tree based method strongly outperforms state-of-the-art online matrix factorization solutions.

Sen and Larson [8] introduce a system that uses data from sensors (such as location) to model the user's situational context and recommend songs, with focus on achieving surprising and delightful recommendations. The authors conducted a focus group to support their design. The rest of the paper introduces the system: the list of smartphone/smartwatch sensors that data will be drawn from, how these will be modelled into context (e.g. from a location reading to "home"), and finally how the situational context tags are used to retrieve songs from SoundCloud; this system is currently being developed as a mobile app.

3. ACKNOWLEDGMENTS

4. REFERENCES

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[1] `http://www.ec.tuwien.ac.at/localrec2015/`