CitRec 2017

International Workshop on Recommender Systems for Citizens

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CitRec 2017: International Workshop on Recommender Systems for Citizens

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ABSTRACT

The "International Workshop on Recommender Systems for Citizens" (CitRec) is focused on a novel type of recommender systems both in terms of ownership and purpose: recommender systems run by citizens and serving society as a whole.

CCS CONCEPTS

• **Information systems → Information retrieval**; **Recommender systems**;

KEYWORDS

Recommender Systems; Citizens; Smart Cities; Spatio-temporal Context-aware Recommendation

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1 INTRODUCTION

With the growing number of people living in ever denser areas, there is an increasing demand for novel Information and Communication Technology (ICT) to support the complex social and environmental interactions of citizens, and to improve their quality of life. A typical example is the concept and construct of the "smart city" [3, 5], which has been introduced to highlight the importance of ICT for enhancing the competitive profile of a city (e.g., liveability, to attract and retain talents).

This workshop focuses on citizens' recommender systems. This particular type of recommender systems, while still belonging to the broad area of recommendation, differs from conventional recommender systems both in terms of ownership and purpose. Unlike conventional recommender systems driven by a per-click business model, citizens' recommender systems are run by citizen themselves and serve the society as a whole.

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Motivation. When restricted to the application for citizens, a large body of literature on recommender systems could be found on Point-Of-Interest (POI) recommendation [1, 12], tourist location recommendation [14], and orthogonally, spatio-temporal context-aware recommendation [6, 7]. However, existing literature primarily focuses on a single domain (e.g., POI recommendation) from an algorithmic perspective [12, 13], without considering the user perspective and the specific activities of citizens, which form a continuous experience. Citizen activities in daily life, including transportation, working, sports, entertainment, shopping, are not only diverse, but also closely related to each other [10]. Together they form the integrated, unbroken experience of a citizen living in an urban environment. The specific needs of citizens calls for scientific investigation on the relationships among citizens' daily activities, in order to better understand their behaviors.

More importantly, the target user of conventional recommender systems are individuals, while recommender systems for citizens are expected to serve the society as a whole. To optimize the effectiveness of recommendations for society, recommender systems for citizens require deep understanding of citizen-environment and citizen-citizen interactions. For example, to optimally recommend driving routes to a community of citizens, the system should be able to understand how the effectiveness of recommendations is influenced by the environment (e.g., road condition) and how the recommendations provided to different citizens affect each other (e.g., to avoid traffic congestion). This example illustrates the need for either algorithmic design that enables recommendations to benefit society as a whole, or incentive mechanisms that balance personal and societal interests.

Challenges and Opportunities. The success of citizens' recommender systems heavily depends on the amount and quality of citizens' behavioral data, which have typically been scarce. The scarcity, on the one hand, can be compensated by engaging citizens to actively contribute their behavioral data to the system, i.e., citizen crowdsourcing via effective incentive schemes.

On the other hand, the emergence of social data, i.e., data generated by people during their societal activities, available through new sources (e.g., social media, mobile phones, sensor networks), brings both opportunities and challenges to the development of citizens' recommender systems. Such data, when well-integrated, contain a multitude of dimensions, such as the targeted urban population, the purpose of use, the spatio-temporal context, etc. [2]. Thus they describe comprehensively citizens' behaviors and their relationships with the environment, providing opportunities for

recommendation based techniques to enhance citizens' living experiences. At the same time, social data are characterized by an intrinsic diversity, manifested through each of the relevant dimensions [9, 11]. It remains an open question how to leverage such diversity for optimally enhancing citizens' living experiences. Another notable challenge is citizen privacy, i.e., how to effectively preserve citizen privacy when capitalizing on social data that are descriptive of citizen behaviors.

Recent studies have shown that recommender systems can actively change citizen mobility patterns, reducing traffic congestion [8] and improve urban mobility [4]. By exploiting social data and addressing the challenges, recommender systems have the potential to largely expand their impact and play an important role in today's society, in improving citizens' living experiences and the effectiveness of environmental use.

Purpose. This workshop on "Recommender Systems for Citizens" aims at bringing together researchers and practitioners from different disciplines to explore the challenges and opportunities of novel approaches to recommender systems that address the intrinsic diversity of social data as a core element of their scientific study and design principles for improving citizen living experiences.

2 THEME AND TOPICS

In order to effectively address the social and environmental aspects of recommender systems for enhancing citizens' living experience, the workshop solicited contributions from researchers from computer science (in particular, recommender systems and related sub-fields), citizen science, and urban science working at the intersections of studying the described classes of recommender systems. We put an emphasis on novel recommender system research that contributes to a better understanding of citizen behaviors and needs, and novel approaches to recommender systems that enhance citizen living experiences that go beyond classic recommendation techniques.

The topics of interest include but are not limited to:

- Requirements definition, design and implementation for citizen recommendation
- Collection, integration, exploration of social data for citizen recommendation
- Citizen user modeling and behavioral analysis
- Mining social data, social urban data for citizen recommendation
- Crowdsourcing for citizen recommendation
- Group recommendation in citizens' recommender systems
- Algorithms for citizen recommendation
- Incentivazation in citizen recommendation
- Spatio-temporal context in citizen recommendation
- Cross-domain recommendation for citizens' continuous living experiences
- Citizen recommendation for smart urban environment
- Design, implementation of citizen knowledge base, and knowledge transfer to citizen recommendation
- User interface for citizen recommendation
- Ethical, cultural issues related to citizen recommendation
- Privacy and policy in citizen recommendation

3 FORMAT AND ACTIVITIES

The half-day workshop includes a keynote presentation (Daniel Gatica-Perez from Idiap Research Institute and EPFL, Switzerland), two sessions of presentations by selected papers, and an interactive discussion panel.

Through discussions on the social and environmental aspects of recommender systems and relating them to experiences from the practice of citizen science and urban science (i.e., in terms of specific problems, conceptual models and use cases), we expect the workshop to facilitate the exchange of experiences between typically disparate research communities from different fields but which are working on related problems.

After the workshop, the participants will come together to write a position paper about the potential and challenges of citizen recommendation. We expect to identify the major challenges and opportunities that will shape the research on recommender systems for citizens in the future.

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