Social Recommender Systems

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ABSTRACT

The goal of this tutorial is to expose participants to the current research on social recommender systems (i.e., recommender systems for the social web). Participants will become familiar with state-of-the-art recommendation methods, their classifications according to various criteria, common evaluation methodologies, and potential applications that can utilize social recommender systems. Additionally, open issues and challenges in the field will be discussed.

Categories and Subject Descriptors: H.3.3 [Information storage and retrieval] [Information Search and Retrieval] [Information filtering]

General Terms: Algorithms, Human Factors

Keywords: Social recommendation, Recommender systems, Social media

1. RECOMMENDATION FOR THE SOCIAL WEB

Social media sites have become tremendously popular in recent years. Prominent examples include photo and video sharing sites such as Flickr and YouTube, blog and wiki systems such as Blogger and Wikipedia, social tagging sites such as Delicious, social network sites such as MySpace and Facebook, and micro-blogging sites such as Twitter. Millions of users are active daily in these sites, creating rich information online that has not been available before. Yet, the abundance and popularity of social media sites floods users with huge volumes of information and hence poses a great challenge in terms of information overload.

Social Recommender Systems (SRSs) aim to alleviate information overload over social media users by presenting the most attractive and relevant content. SRSs also aim at increasing adoption, engagement, and participation of new and existing users of social media sites. Recommendations of content (blogs, wikis, etc.) [5], tags [9], people [3], and communities [2] often use personalization techniques adapted to the needs and interests of the individual user, or a set of users [6].

Social media and personalized recommender systems can mutually benefit from one another: on the one hand, social media introduces new types of public data and metadata, such as tags [8], ratings, comments, and explicit people re-

lationships, which can be utilized to enhance recommendations; on the other hand, recommender technologies can play a key role in the success of social media applications and the social web as a whole, assuring each user is presented with the most attractive and relevant content, on a personal basis.

In this tutorial, we will discuss the key motivations for social media sites to apply recommendation techniques and review the fundamental recommendation approaches. We will then present the key domains for social recommender systems, both in terms of the recommended entities and target audience. Following, we will review methods for handling the cold start problem, incorporating trust and reputation, and providing useful explanations for the recommendations. We will then discuss several temporal aspects that affect social recommender systems followed by a review of evaluation techniques, with emphasis on the pros and cons of each method. Finally, we will summarize by discussion on open issues and challenges in the field.

This tutorial extends the tutorial titled "Introduction to Social Recommendation" given by King et al. at WWW 2010 [7]. That tutorial introduced a few of the aspects discussed in our proposal, as well as related topics like social search and social media analysis. Our tutorial is a natural extension, providing a deeper dive into more specific aspects of social recommender systems, as detailed below.

2. TUTORIAL OUTLINE

1. Introduction:
   - Web 2.0 and Social Media sites
   - Information and Interaction Overload in Social Media

2. Fundamental Recommendation approaches
   - Content-based
   - Collaborative Filtering
   - Hybrid methods

3. Recommendation techniques for social media sites
   - Definition
   - Entity Recommendation
     - Content recommendation
     - Tag recommendation
     - People recommendation

   – Community recommendation
- Target audience
  - Recommendations for individuals
  - Recommendations for Groups or communities
  - Recommendations for everyone

4. The Cold Start problem
   - For new users
   - Of new items

5. Trust and Reputation
   - Trust-aware recommender systems
   - Reputation-aware recommender systems

6. Explanations and Transparency

7. Social Recommender Systems in the Enterprise

8. Temporal aspects in social recommendation
   - Data decay factors
   - Recommendation over time
   - Recommendation updates based on the user feedback (explicit, implicit)

9. Social recommendation over activity streams (e.g. Twitter, Facebook)
   - Personalized filtering of the stream
   - Utilizing the stream for recommendation

10. Evaluation methods
    - Offline methods
    - User Surveys
    - Crowdsourcing
    - Live Systems

11. Summary
    - Open issues
    - Research challenges

3. PRESENTERS

Ido Guy. manages the Social Technologies group at the IBM Haifa Research Lab, to which he joined in 2000. Ido has led and contributed to various projects around collaboration technologies and social analytics. In 2010, he received a Corporate Award for his contribution to Enterprise Social Software.

Ido's main area of research activity is social media, with special focus on social network mining and analysis and on recommender systems. He has published various papers, spanning the fields of Human-Computer Interaction, Information and Knowledge Management, and Data Mining. In recent years, Ido has been particularly active in the area of Social Recommender Systems, publishing key papers on people recommendation, content recommendation in social media [4, 5], and personalized social search [1]. He is co-chair

of the Workshop on Social Recommender Systems (held at IUI 2010 and CSCW 2011) and a guest co-editor of the ACM TIST special issue on Social Recommender Systems (published in 2011). Ido was also co-chair of the industry program of the 2010 ACM Recommender Systems conference.

David Carmel. is a Research Staff Member at the Information Retrieval group at IBM Haifa Research Lab. David earned his PhD in Computer Science from the Technion, Israel Institute of Technology in 1997. David's research is focused on search in the enterprise, query performance prediction, social search, social recommendation and text mining. For several years David taught the Introduction to IR course at the CS department at Haifa university.

At IBM, David is a key contributor to IBM enterprise search offerings. David is a co-founder of the Juru search engine which provides integrated search capabilities to several IBM products, and was used as a search platform for several studies in the TREC conferences. David has published more than 80 papers in Information retrieval and Web journals and conferences, and serves on the PC of many Web and IR conferences (SIGIR, WWW, WSDM, CIKM). He is a member of the editorial board of the IR journal, and co-chaired the WDSM 2011 workshop on user modeling for web applications. David has been involved recently in the area of social search and recommendation [1, 4, 5].

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