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Towards Next-Generation Multimedia Recommendation Systems

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Citation

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ABSTRACT

Empowered by advances in information technology, such as social media network, digital library and mobile computing, there emerges an ever-increasing amounts of multimedia data. As the key technology to address the problem of information overload, multimedia recommendation system has been received a lot of attentions from both industry and academia. This course aims to 1) provide a series of detailed review of state-of-the-art in multimedia recommendation; 2) analyze key technical challenges in developing and evaluating next generation multimedia recommendation systems from different perspectives and 3) give some predictions about the road lies ahead of us.

Categories and Subject Descriptors

H.3.3 [**Information Search and Retrieval**]: Information Search and Retrieval

General Terms

Algorithms, Performance, Theory

Keywords

Multimedia, Next Generation Recommendation Systems

1. INTRODUCTION

Multimedia recommendation system is emerging as a promising technology to address the problem of information overload. However, multimedia recommendation can be a challenging research problem. The main reason is threefold. First, multimedia data often contains a lot of high-level semantic meanings. How to generate a concise and compact representation for such information is an important but unsolved problem. Second, in many real applications (e.g., video on demand), the scale of data is big and this requires huge amount of computing resources such as data processing and storage power. This issue becomes especially prominent with increasing prevalence of social multimedia and smart devices. Third, multimedia includes various kinds of content forms (e.g., audio, visual, text and others). In this case, it is infeasible to apply the traditional solutions developed for structured data (e.g., data from relational database) to achieve comprehensive analysis.

The signif cance of multimedia recommendation has led to intense research in various CS and IS disciplines [1, 2, 3, 4]. Meanwhile, various commercial online portals (e.g., YouTube, Flickr and Last.Fm) have applied the techniques to help the users to access accurate and comprehensive contents and services. This tutorial aims to 1) cover a wide range of both simple and advanced techniques in the domain of multimedia recommendation; 2) analyze key technical challenges and open issues in developing and evaluating next generation multimedia recommendation system from different perspectives and 3) give some predictions about the research problems and potential solutions. Multimedia recommendation is closely related to various aspects of multimedia computing. Thus, we expect the 3-hour class to attract a lot of attentions from multimedia community. Also from the seminar, we expect the attendees will gain (i) a good understanding of importance of recommendation system,(ii) knowledge about next generation multimedia recommendation development, and (iii) a comprehensive overview of existing tools and real systems.

2. TUTORIAL OVERVIEW

The tutorial consists of four core sections. In the f rst section - introduction, the tutorial provide a comprehensive overview about the importance of multimedia recommendation and related work. We then present a detailed review of existing mobile and location based recommendation techniques. A few fundamental research issues are discussed and they include user mobility, location modeling, main business model and large scale system evaluation. After that, we introduce several techniques for social multimedia recommendation. We also discuss how to extract and integrate social contextual information to achieve accurate recommendation under different real environments. Finally, the tutorial is concluded with open discussions about future study, key research challenges and potential solutions.

3. REFERENCES

[1] G. Adomavicius and A. Tuzhilin. Toward the next generation of recommender systems: A survey of the state-of-the-art and possible extensions. *IEEE Trans. Knowl. Data Eng.*, 17(6):734–749, 2005.

[2] J. Davidson, B. Liebald, J. Liu, P. Nandy, T. V. Vleet, U. Gargi, S. Gupta, Y. He, M. Lambert, B. Livingston, and D. Sampath. The youtube video recommendation system. In *RecSys*, pages 293–296, 2010.

[3] F. Ricci, L. Rokach, B. Shapira, and P. B. Kantor. *Recommender Systems Handbook.* Springer, 2011.

[4] J. Shen, M. Wang, S. Yan, and P. Cui. Multimedia recommendation: technology and techniques. In *ACM SIGIR*, page 1131, 2013.