The Challenge of Recommender Systems Challenges

Alan Said
Technische Universität Berlin
Berlin, Germany
alan@dai-lab.de

Domonkos Tikk
Gravity R&D
Budapest, Hungary
domonkos.tikk@
gravityrd.com

Andreas Hotho
Universität Würzburg
Würzburg, Germany
hotho@informatik.
uni-wuerzburg.de

ABSTRACT

Recommender System Challenges such as the Netflix Prize, KDD Cup, etc. have contributed vastly to the development and adoptability of recommender systems. Each year a number of challenges or contests are organized covering different aspects of recommendation. In this tutorial and panel, we present some of the factors involved in successfully organizing a challenge, whether for reasons purely related to research, industrial challenges, or to widen the scope of recommender systems applications.

Categories and Subject Descriptors

D.2.8 [**Software Engineering**]: Metrics - complexity measures, performance measures; H.3.3 [**Information Storage and Retrieval**]: Information Search and Retrieval - Information filtering, Retrieval models, Selection process; H.3.4 [**Information Technology and Systems Applications**]: Decision support; H.3.5 [**Online Information Services**]: Data Sharing; H.5.1 [**Multimedia Information Systems**]: Evaluation/methodology

General Terms

Algorithms, Design, Experimentation, Human Factors, Measurement, Performance

Keywords

benchmarks, evaluation, challenge, contest

1. INTRODUCTION

With the launch of the Netflix Prize[1] in 2006, recommender systems challenges, or contests, allowed the everyman to access large-scale, real-world user data, and try to beat a commercial recommender system. Thousands of people participated in the challenge over its three year run. Subsequently, other challenges have been organized, both by the industry[2], as well as academia[3], and today there are several challenges (large and small) organized on a yearly basis. This tutorial gives an insight into the organization of a challenge, from planning and preparation of data, to the execution and final evaluation of submitted approaches.

2. OVERVIEW

The tutorial is organized into three parts, each covering a different topic in the concept of recommender systems challenges. In the first section (Introduction), an introduction to previous and current recommender systems challenges is given. Challenge-related topics are introduced and discussed, e.g. datasets, evaluation details with specific focus on which type of aspects should be evaluated, e.g.

- Qualitative requirements - include recommendation-related features such recommendation quality, satisfaction, etc.
- Technical requirements - include aspects related to the recommendation setting, such as scalability, robustness and data constraints

The second part of the tutorial (Preparation, Execution & Evaluation of a challenge) covers the practicalities involved in the process of organizing a challenge. Topics such a evaluation types (offline vs. online), anonymization of data are discussed. In the final part of the tutorial (Conclusion) the concept of the recommender system challenge is revisited to sum up the most important aspects of the realization of a recommender systems challenge, e.g. benchmarking, data, user-centricity.

After the tutorial, a panel on recommender system challenges is held to discuss relevant topics and answer any question from the audience.

3. OBJECTIVES

The objectives of this tutorial is to elicit more interest in the concept of challenges, whether as an organizer or participant. Recommender systems challenges have undoubtedly brought the related research forward. By organizing a challenge, any problem can be brought to light and entice interest among those who would have not approached the problem otherwise.

[1] `http://www.netflixprize.com`

[2] `http://overstockreclabprize.com`

[3] e.g. the CAMRa Challenge `http://www.camrachallenge.com` or the ECML/PKDD Discovery Challenge - specifically `http://www.kde.cs.uni-kassel.de/ws/rsdc08/` and `http://www.kde.cs.uni-kassel.de/ws/dc09/`

RecSys'12, September 9–13, 2012, Dublin, Ireland.
ACM 978-1-4503-1270-7/12/09.

4. OUTLINE

The tutorial starts with a presentation of challenge-related concepts and concludes with a panel discussion.

- Introduction
  - History
  - Why recommender challenges are important?
  - Requirements of recommender systems to be evaluated
- Execution
  - Evaluation methods: offline and online
  - Dataset preparation
  - Organization
  - Evaluation
    - Qualitative assessment: error rate, accuracy, ranking-based metrics
    - Technical assessment: scalability, robustness, real-time responding
- Conclusion
- Panel discussion

5. ORGANIZERS

Alan Said is a postgraduate researcher at the Competence Center for Information Retrieval and Machine Learning at the Distributed Artificial Intelligence (DAI) Lab of Technische Universität Berlin. He is working in the field of recommender systems, focusing on recommender system evaluation, context-aware and hybrid recommender systems. He has been a co-chair of the Challenges on Context-Aware Movie Recommendation (CAMRa) held in conjunction with ACM RecSys in 2010 and 2011, and the 2012 RecSysChallenge held in conjunction with ACM RecSys 2012.

Domonkos Tikk is the Chief Scientific Officer at Gravity R&D Inc., a recommender solution vendor company. Domonkos obtained his PhD in 2000 in computer science from Budapest University of Technology and Economics. He has been working on machine learning and data and text mining topics in the last decade. His team, Gravity, participated at the Netflix Prize challenge, and was a leader of the The Ensemble team finished tied at the first position of the challenge. The team members founded the company Gravity to exploit the results achieved in Netflix Prize. Domonkos published actively in the field of recommender systems, co-authored about 20 papers in the last years. He also acted as the co-chair of at the recommender system related KDD-Cup 2007, RecsysChallange 2012 and RecSys Doctoral Symposium in 2011.

Andreas Hotho is a professor at the University of Würzburg. He holds a Ph.D. from the University of Karlsruhe, where he worked from 1999 to 2004 at the Institute of Applied Informatics and Formal Description Methods (AIFB) in the areas of text, data, and web mining, semantic web and information retrieval. He earned his Master's Degree in information systems from the University of Braunschweig in 1998. From 2004 to 2009 he was a senior researcher at the University of Kassel. He joined the L3S in 2011. Since 2005 he has been leading the development of the social bookmark and publication sharing platform BibSonomy. Andreas Hotho has published over 90 articles in journals and at conferences, co-edited several special issues and books, and co-chaired several workshops, e.g. the Workshop on Recommender Systems and the Social Web in 2011 and 2012 held in conjunction with ACM RecSys and the ECML PKDD Discovery Challenge in 2008 and 2009. He worked as a reviewer for journals and was a member of many international conferences and workshops program committees. His research focuses on the combination of data mining, information retrieval and the semantic web. Further, he is interested in the analysis of social media systems, in particular folksonomies, tagging, and sensor data emerging trough ubiquitous and social activities. As the World Wide Web is one of his main application areas, his research contributes to the field of web science.