

Tutorial Proposal:

Evaluation of Recommender Systems

ACM Symposium on Applied Computing '2012

By Markus Zanker and Dietmar Jannach

Duration:

Half-day.

Abstract

Recommender Systems facilitate users' decision making when confronted with complex choice situations by easing the information overload. One prominent example is the book recommendation service of the e-tailer Amazon.com. Collaborative recommendation approaches are based on the assumption that users, who had similar tastes in the past, will also make similar choices in the future. In contrast, other approaches such as content-based filtering exploit semantic information such as product features or textual descriptions; knowledge-based algorithms, finally, generate item recommendations based on explicit knowledge models from the domain.

Technically, Recommender Systems have their roots in different fields such as Information Retrieval, Text Classification, Machine Learning and Decision Support Systems. The tutorial will therefore offer first an introduction to the topic and popular methods for building Recommender Systems and will furthermore focus on how to measure and evaluate the efficiency and effectiveness of such systems. We will cover the spectrum of seeing recommendation systems as technical ranking algorithms and as methods for consumer decision support. Therefore, we will present and discuss different categories and cases of research designs from a conceptual perspective and compare them with good practices in other research disciplines like Information Retrieval, Machine Learning or Decision Support Systems.

Outline

The presentation will be partly based on the book "Recommender Systems – An Introduction"* that is co-authored by the tutorial proposers and was just recently published by Cambridge University Press (<http://www.cambridge.org/uk/catalogue/catalogue.asp?isbn=9780521493369>).

*Jannach, D., Zanker, M., Felfernig, A., Friedrich, G.: Recommender Systems An Introduction, Cambridge University Press, 2010.

Overview on recommendation systems: Today, systems of this kind are in wide use and have also been extensively studied over the last fifteen years. We will cover the different underlying techniques and explain the most important algorithms:

- Collaborative and content-based filtering, social recommenders, knowledge-based approaches, typology of different predictive models.

- Acquisition and evolution of user models for recommender systems.
- Hybridization and ensemble learning techniques.
- Techniques for automated model extraction and construction.
- The role of domain knowledge in recommender systems.
- Web 2.0 and Semantic Web techniques in recommender systems.

Evaluating recommender systems: Research in recommender systems is strongly driven by the goal of improving the quality of the recommendations. The question that immediately arises is of course how we can actually measure the quality of the proposals made by a recommender system. Thus, the questions addressed will include the following:

- Applicable research designs for evaluating recommender systems. Discussion on the state-of-practice.
- Evaluating recommender systems using experiments on historical datasets.
- Optimization goals and mechanism designs for optimizing recommender systems.
- Applicable metrics for different evaluation goals.
- Limitations of existing evaluation techniques, in particular when it comes to conversational systems or the aspect of the business value of a recommender system.
- Perspectives from other fields such as Information Systems or Psychology for future research.

Bios

Dietmar Jannach is a professor in Computer Science at TU Dortmund, Germany, and chair of the e-Services Research Group. His main research interests lie in the application of Artificial Intelligence and Knowledge-based Systems technology to real-world problems in particular in e-Business environments. He has authored numerous papers on intelligent sales support systems such as recommender systems or product configurators. Dietmar Jannach was also one of the co-founders of ConfigWorks GmbH, a company focusing on next-generation interactive recommendation and advisory systems. Dietmar Jannach is the program co-chair of the 5th ACM Conference on Recommender Systems to be held in Chicago, USA, in 2011. Dietmar Jannach

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Markus Zanker is an associate professor at the Department for Applied Informatics at the Alpen-Adria-Universität Klagenfurt, Austria, and he is a co-founder and director of ConfigWorks GmbH, a provider of interactive selling solutions. He received his MS and doctorate degree in Computer Science and MBA in business administration from Klagenfurt University. His research interests lie in the area of knowledge-based systems, in particular in the fields of interactive sales applications such as product configuration and recommendation. He has co-organized the workshops on recommender systems in conjunction with the ECAI conferences in 2006 and 2008. Markus Zanker is an associate

editor of the International Journal on Human-Computer Studies and program co-chair of the 4th ACM Conference on Recommender Systems held in Barcelona, Spain, in 2010.

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Relevance

Recommender Systems constitute a very active research area with significant industrial interest in this technology, in particular as recent studies show that personalized recommendations can measurably increase sales on the online channel. Academic crowdsourcing activities such as the 1 Million Dollar contest of the DVD rental service company Netflix helped to stimulate further interest in the field. Therefore, the tutorial will also report on recent case studies and give an outlook on current developments in the field.

Earlier tutorials

The proposers gave an introductory tutorial at IJCAI 2011 (Slides of the IJCAI Tutorial: <http://ijcai-11.iia.csic.es/files/proceedings/Tutorial%20IJCAI%202011%20Gesamt.pdf>). For the ACM SAC tutorial the material will be modified to focus more on the evaluation aspect (methodology, metrics, and results for different variants of algorithm design).

Equipment

No additional equipment needed.