

Recommender Systems Handbook

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Editors

Recommender Systems Handbook

Second Edition

 Springer

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Dedicated to

*our families in appreciation of their patience and
support during the preparation of this handbook
and to*

*all our students in appreciation of their ideas,
patience and stimulus for better understanding
the topics covered in this handbook*

F.R.

L.R.

B.S.

Preface

Recommender systems are software tools and techniques providing suggestions for items to be of use to a user. The suggestions provided by a recommender system are aimed at supporting their users in various decision-making processes, such as what items to buy, what music to listen, or what news to read. Recommender systems are valuable means for online users to cope with information overload and help them making better choices. They are now one of the most powerful and popular information discovery tools on the web. Several techniques for recommendation generation have been proposed, and during the last decade, many of them have also been successfully deployed in commercial environments.

Development of recommender systems is a multi-disciplinary effort which involves experts from various fields such as artificial intelligence, human computer interaction, data mining, statistics, decision support systems, marketing, and consumer behavior.

The first edition of the handbook, which was published 4 years ago, was extremely well received by the recommender systems community. The positive reception, along with the fast pace of research in recommender systems, motivated us to update the handbook. This second edition aims to refresh the previously presented material and to present new findings in the field. The Recommender Systems Handbook is now offered in a majorly revised edition; about half of the chapters are totally new and the remaining chapters are updated versions of selected chapters already published in the first edition.

Despite these revisions, the goal of this handbook remains unaltered. It still aims to present both fundamental knowledge and more advanced topics by organizing them in a coherent and unified repository of recommender systems' major concepts, theories, methods, trends, challenges, and applications. This is still the unique comprehensive book, which is dedicated entirely to the field of recommender systems. Its informative, factual pages will provide researchers, students, and practitioners in industry with a comprehensive, yet concise and convenient reference source to recommender systems.

This book describes in detail the classical methods, as well as extensions and novel approaches that were more recently introduced. It consists of five parts:

techniques, evaluation of recommender systems, applications, human computer interaction, and advanced topics. The first part presents the most popular and fundamental techniques used nowadays for building recommender systems, such as collaborative filtering, semantic-based methods, data mining, and context-aware methods. The second part focuses on methods and techniques for evaluating the performance and effect of recommender systems by means of both off-line and live user experiments. The third part contains several chapters on diverse applications of recommendation techniques. After a first chapter dedicated to general issues related to the industrial implementation and exploitation of recommender system, the other sections focus on various application domains: music, learning, mobile, social, and reciprocal. The fourth part includes papers addressing the presentation, browsing, explanation, and visualization of the recommendations and important issues related to human decision making and recommender systems. Finally, the last section collects a few papers on some advanced topics such as the exploitation of active learning principles to guide the acquisition of new knowledge, techniques suitable for making a recommender system robust against attacks of malicious users, and recommender systems that aggregate multiple types of user feedbacks and preferences to build more reliable recommendations or recommendations for groups.

We would like to thank all authors for their valuable contributions. We would like to express gratitude for all reviewers who generously gave comments on drafts or counsel otherwise. We would like to express our special thanks to Susan Lagerstrom-Fife and staff members of Springer for their kind cooperation throughout the production of this book. Finally, we wish this handbook will contribute to the growth of this subject, we wish to the novices a fruitful learning path, and to those more experts a compelling application of the ideas discussed in this handbook and a fruitful development of this challenging research area.

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