Recommender Systems

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Recommender Systems - Charu C. Aggarwal 2016-03-28
This book comprehensively covers the topic of recommender systems, which provide personalized recommendations of products or services to users based on their previous searches or purchases. Recommender system methods have been adapted to diverse applications including query log mining, social networking, news recommendations, and computational advertising. This book synthesizes both fundamental and advanced topics of a research area that has now reached maturity. The chapters of this book are organized into three categories: Algorithms and evaluation: These chapters discuss the fundamental

algorithms in recommender systems, including collaborative filtering methods, content-based methods, knowledge-based methods, ensemble-based methods, and evaluation. Recommendations in specific domains and contexts: the context of a recommendation can be viewed as important side information that affects the recommendation goals. Different types of context such as temporal data, spatial data, social data, tagging data, and trustworthiness are explored. Advanced topics and applications: Various robustness aspects of recommender systems, such as shilling systems, attack models, and their defenses are discussed. In addition, recent topics, such as learning to rank, multi-armed bandits, group systems, multi-criteria systems, and active learning systems, are introduced together with applications. Although this book primarily serves as a textbook, it will also appeal to industrial practitioners and researchers due to its focus on applications and references. Numerous examples and exercises have been provided, and a solution manual is available for instructors.

Recommender Systems for Technology Enhanced Learning - Nikos Manouselis 2014-04-12
As an area, Technology Enhanced Learning (TEL) aims to design, develop and test socio-technical innovations that will support and enhance learning practices of individuals and organizations. Information retrieval is a pivotal activity in TEL and the deployment of recommender systems has attracted increased interest during the past years. Recommendation methods, techniques and systems open an interesting new approach to facilitate and support learning and teaching. The goal is to develop, deploy and evaluate systems that provide learners and teachers with meaningful guidance in order to help identify suitable learning resources from a potentially overwhelming variety of choices. Contributions address the following topics: i) user and item

data that can be used to support learning recommendation systems and scenarios, ii) innovative methods and techniques for recommendation purposes in educational settings and iii) examples of educational platforms and tools where recommendations are incorporated.

Information and Recommender Systems - Elsa Nègre 2015-10-02
Information is an element of knowledge that can be stored, processed or transmitted. It is linked to concepts of communication, data, knowledge or representation. In a context of steady increase in the mass of information it is difficult to know what information to look for and where to find them. Computer techniques exist to facilitate this research and allow relevant information extraction. Recommendation systems introduced the notions inherent to the recommendation, based, inter alia, information search, filtering, machine learning, collaborative approaches. It also deals with the assessment of such systems and has various applications.

Recommender Systems - P. Pavan Kumar 2021-06-01
Recommender systems use information filtering to predict user preferences. They are becoming a vital part of e-business and are used in a wide variety of industries, ranging from entertainment and social networking to information technology, tourism, education, agriculture, healthcare, manufacturing, and retail. Recommender Systems: Algorithms and Applications dives into the theoretical underpinnings of these systems and looks at how this theory is applied and implemented in actual systems. The book examines several classes of recommendation algorithms, including Machine learning algorithms Community detection algorithms Filtering algorithms Various efficient and robust product recommender systems using machine learning algorithms are helpful in filtering and exploring unseen data by users for better prediction and extrapolation of decisions.

These are providing a wider range of solutions to such challenges as imbalanced data set problems, cold-start problems, and long tail problems. This book also looks at fundamental ontological positions that form the foundations of recommender systems and explain why certain recommendations are predicted over others. Techniques and approaches for developing recommender systems are also investigated. These can help with implementing algorithms as systems and include A latent-factor technique for model-based filtering systems Collaborative filtering approaches Content-based approaches Finally, this book examines actual systems for social networking, recommending consumer products, and predicting risk in software engineering projects.

Machine Learning: Make Your Own Recommender System - Oliver Theobald 2018-10-06
Learn How to Make Your Own Recommender System in an Afternoon.Recommender systems are one of the most visible applications of machine learning and data mining today and their uncanny ability to convert our unspoken actions into items we desire is both addicting and concerning. And whether recommender systems excite or scare you, the best way to manage their influence and impact is to understand the architecture and algorithms that play on your personal data. Recommender systems are here to stay and for anyone beginning their journey in data science, this is a lucrative space for future employment.This book will get you up and running with the basics as well as the steps to coding your own recommender system. Exercises include predicting book recommendations, relevant house properties for online marketing purposes, and whether a user will click on an ad campaign. The contents of this book is designed for beginners with some background knowledge of data science, including classical statistics and computing programming. If this is your first

exposure to data science, you may want to spend a few hours to read my first book Machine Learning for Absolute Beginners before you get started here.Topics covered in this book: Setting Up A Sandbox Environment With Jupyter NotebookWorking With DataData ReductionBuilding a Collaborative Filtering ModelBuilding a Content-Based Filtering ModelEvaluationPrivacy & EthicsFuture of Recommender SystemsPlease feel welcome to join this introductory course by buying a copy or sending a free sample to your preferred device.

Group Recommender Systems - Alexander Felfernig 2018-03-07
This book presents group recommender systems, which focus on the determination of recommendations for groups of users. The authors summarize different technologies and applications of group recommender systems. They include an in-depth discussion of state-of-the-art algorithms, an overview of industrial applications, an inclusion of the aspects of decision biases in groups, and corresponding de-biasing approaches. The book includes a discussion of basic group recommendation methods, aspects of human decision making in groups, and related applications. A discussion of open research issues is included to inspire new related research. The book serves as a reference for researchers and practitioners working on group recommendation related topics.

Recommender Systems for Location-based Social Networks - Panagiotis Symeonidis 2014-02-08
Online social networks collect information from users' social contacts and their daily interactions (co-tagging of photos, co-rating of products etc.) to provide them with recommendations of new products or friends. Lately, technological progressions in mobile devices (i.e. smart phones) enabled the incorporation of geo-location data in the traditional web-based online social networks, bringing the new era of Social and Mobile Web. The goal of this book is to bring

together important research in a new family of recommender systems aimed at serving Location-based Social Networks (LBSNs). The chapters introduce a wide variety of recent approaches, from the most basic to the state-of-the-art, for providing recommendations in LBSNs. The book is organized into three parts. Part 1 provides introductory material on recommender systems, online social networks and LBSNs. Part 2 presents a wide variety of recommendation algorithms, ranging from basic to cutting edge, as well as a comparison of the characteristics of these recommender systems. Part 3 provides a step-by-step case study on the technical aspects of deploying and evaluating a real-world LBSN, which provides location, activity and friend recommendations. The material covered in the book is intended for graduate students, teachers, researchers, and practitioners in the areas of web data mining, information retrieval, and machine learning.

Recommendation Engines - Michael Schrage 2020-09-01 How companies like Amazon and Netflix know what "you might also like": the history, technology, business, and social impact of online recommendation engines. Increasingly, our technologies are giving us better, faster, smarter, and more personal advice than our own families and best friends. Amazon already knows what kind of books and household goods you like and is more than eager to recommend more; YouTube and TikTok always have another video lined up to show you; Netflix has crunched the numbers of your viewing habits to suggest whole genres that you would enjoy. In this volume in the MIT Press's Essential Knowledge series, innovation expert Michael Schrage explains the origins, technologies, business applications, and increasing societal impact of recommendation engines, the systems that allow companies worldwide to know what products, services, and experiences "you might also like." Schrage offers a history of recommendation that reaches

back to antiquity's oracles and astrologers; recounts the academic origins and commercial evolution of recommendation engines; explains how these systems work, discussing key mathematical insights, including the impact of machine learning and deep learning algorithms; and highlights user experience design challenges. He offers brief but incisive case studies of the digital music service Spotify; ByteDance, the owner of TikTok; and the online personal stylist Stitch Fix. Finally, Schrage considers the future of technological recommenders: Will they leave us disappointed and dependent—or will they help us discover the world and ourselves in novel and serendipitous ways?

Recommender System with Machine Learning and Artificial Intelligence - Sachi Nandan Mohanty 2020-06-09
This book is a multi-disciplinary effort that involves world-wide experts from diverse fields, such as artificial intelligence, human computer interaction, information technology, data mining, statistics, adaptive user interfaces, decision support systems, marketing, and consumer behavior. It comprehensively covers the topic of recommender systems, which provide personalized recommendations of items or services to the new users based on their past behavior. Recommender system methods have been adapted to diverse applications including social networking, movie recommendation, query log mining, news recommendations, and computational advertising. This book synthesizes both fundamental and advanced topics of a research area that has now reached maturity. Recommendations in agricultural or healthcare domains and contexts, the context of a recommendation can be viewed as important side information that affects the recommendation goals. Different types of context such as temporal data, spatial data, social data, tagging data, and trustworthiness are explored. This book illustrates how this

technology can support the user in decision-making, planning and purchasing processes in agricultural & healthcare sectors.

Building Recommender Systems with Machine Learning and AI: Help People Discover New Products and Content with Deep Learning, Neural Networks, and Mach - Frank Kane 2018-08-11
Learn how to build recommender systems from one of Amazon's pioneers in the field. Frank Kane spent over nine years at Amazon, where he managed and led the development of many of Amazon's personalized product recommendation technologies.You've seen automated recommendations everywhere - on Netflix's home page, on YouTube, and on Amazon as these machine learning algorithms learn about your unique interests, and show the best products or content for you as an individual. These technologies have become central to the largest, most prestigious tech employers out there, and by understanding how they work, you'll become very valuable to them.This book is adapted from Frank's popular online course published by Sundog Education, so you can expect lots of visual aids from its slides and a conversational, accessible tone throughout the book. The graphics and scripts from over 300 slides are included, and you'll have access to all of the source code associated with it as well.We'll cover tried and true recommendation algorithms based on neighborhood-based collaborative filtering, and work our way up to more modern techniques including matrix factorization and even deep learning with artificial neural networks. Along the way, you'll learn from Frank's extensive industry experience to understand the real-world challenges you'll encounter when applying these algorithms at large scale and with real-world data.This book is very hands-on; you'll develop your own framework for evaluating and combining many different recommendation algorithms together, and you'll even build your own neural networks

using Tensorflow to generate recommendations from real-world movie ratings from real people. We'll cover: -Building a recommendation engine-Evaluating recommender systems-Content-based filtering using item attributes-Neighborhood-based collaborative filtering with user-based, item-based, and KNN CF-Model-based methods including matrix factorization and SVD-Applying deep learning, AI, and artificial neural networks to recommendations-Session-based recommendations with recursive neural networks-Scaling to massive data sets with Apache Spark machine learning, Amazon DSSTNE deep learning, and AWS SageMaker with factorization machines-Real-world challenges and solutions with recommender systems-Case studies from YouTube and Netflix-Building hybrid, ensemble recommendersThis comprehensive book takes you all the way from the early days of collaborative filtering, to bleeding-edge applications of deep neural networks and modern machine learning techniques for recommending the best items to every individual user.The coding exercises for this book use the Python programming language. We include an intro to Python if you're new to it, but you'll need some prior programming experience in order to use this book successfully. We also include a short introduction to deep learning, Tensorfow, and Keras if you are new to the field of artificial intelligence, but you'll need to be able to understand new computer algorithms.Dive in, and learn about one of the most interesting and lucrative applications of machine learning and deep learning there is!

Recommender Systems Handbook - Francesco Ricci 2016-08-23
This second edition of a well-received text, with 20 new chapters, presents a coherent and unified repository of recommender systems' major concepts, theories, methodologies, trends, and challenges. A variety of real-world applications and detailed case studies are

included. In addition to wholesale revision of the existing chapters, this edition includes new topics including: decision making and recommender systems, reciprocal recommender systems, recommender systems in social networks, mobile recommender systems, explanations for recommender systems, music recommender systems, cross-domain recommendations, privacy in recommender systems, and semantic-based recommender systems. This multi-disciplinary handbook involves world-wide experts from diverse fields such as artificial intelligence, human-computer interaction, information retrieval, data mining, mathematics, statistics, adaptive user interfaces, decision support systems, psychology, marketing, and consumer behavior. Theoreticians and practitioners from these fields will find this reference to be an invaluable source of ideas, methods and techniques for developing more efficient, cost-effective and accurate recommender systems.

Recommender Systems for Information Providers - Andreas W. Neumann 2009-03-03 Information providers are a very promising application area of recommender systems due to the general problem of assessing the quality of information products prior to the purchase. Recommender systems automatically generate product recommendations: customers profit from a faster finding of relevant products, stores profit from rising sales. All aspects of recommender systems are covered: the economic background, mechanism design, a survey of systems in the Internet, statistical methods and algorithms, service oriented architectures, user interfaces, as well as experiences and data from real-world applications. Specific solutions for areas with strong privacy concerns, scalability issues for large collections of products, as well as algorithms to lessen the cold-start problem for a faster return on investment of recommender projects are addressed. This book describes all

steps it takes to design, implement, and successfully operate a recommender system for a specific information platform.

Recommender Systems for Social Tagging Systems - Leandro Balby Marinho 2012-02-10 Social Tagging Systems are web applications in which users upload resources (e.g., bookmarks, videos, photos, etc.) and annotate it with a list of freely chosen keywords called tags. This is a grassroots approach to organize a site and help users to find the resources they are interested in. Social tagging systems are open and inherently social; features that have been proven to encourage participation. However, with the large popularity of these systems and the increasing amount of user-contributed content, information overload rapidly becomes an issue. Recommender Systems are well known applications for increasing the level of relevant content over the "noise" that continuously grows as more and more content becomes available online. In social tagging systems, however, we face new challenges. While in classic recommender systems the mode of recommendation is basically the resource, in social tagging systems there are three possible modes of recommendation: users, resources, or tags. Therefore suitable methods that properly exploit the different dimensions of social tagging systems data are needed. In this book, we survey the most recent and state-of-the-art work about a whole new generation of recommender systems built to serve social tagging systems. The book is divided into self-contained chapters covering the background material on social tagging systems and recommender systems to the more advanced techniques like the ones based on tensor factorization and graph-based models.

Persuasive Recommender Systems - Kyung-Hyan Yoo 2012-08-17
Whether users are likely to accept the recommendations provided by a recommender system is of utmost importance to system

designers and the marketers who implement them. By conceptualizing the advice seeking and giving relationship as a fundamentally social process, important avenues for understanding the persuasiveness of recommender systems open up. Specifically, research regarding influential factors in advice seeking relationships, which is abundant in the context of human-human relationships, can provide an important framework for identifying potential influence factors in recommender system context. This book reviews the existing literature on the factors in advice seeking relationships in the context of human-human, human-computer, and human-recommender system interactions. It concludes that many social cues that have been identified as influential in other contexts have yet to be implemented and tested with respect to recommender systems. Implications for recommender system research and design are discussed.

Recommender Systems - Dietmar Jannach

2010-09-30
In this age of information overload, people use a variety of strategies to make choices about what to buy, how to spend their leisure time, and even whom to date. Recommender systems automate some of these strategies with the goal of providing affordable, personal, and high-quality recommendations. This book offers an overview of approaches to developing state-of-the-art recommender systems. The authors present current algorithmic approaches for generating personalized buying proposals, such as collaborative and content-based filtering, as well as more interactive and knowledge-based approaches. They also discuss how to measure the effectiveness of recommender systems and illustrate the methods with practical case studies. The final chapters cover emerging topics such as recommender systems in the social web and consumer buying behavior theory. Suitable for computer science researchers and students interested in getting

an overview of the field, this book will also be useful for professionals looking for the right technology to build real-world recommender systems.

Fashion Recommender Systems - Nima Dokoohaki 2020-11-04
This book includes the proceedings of the first workshop on Recommender Systems in Fashion 2019. It presents a state of the art view of the advancements within the field of recommendation systems with focused application to e-commerce, retail and fashion. The volume covers contributions from academic as well as industrial researchers active within this emerging new field. Recommender Systems are often used to solve different complex problems in this scenario, such as social fashion-based recommendations (outfits inspired by influencers), product recommendations, or size and fit recommendations. The impact of social networks and the influence that fashion influencers have on the choices people make for shopping is undeniable. For instance, many people use Instagram to learn about fashion trends from top influencers, which helps them to buy similar or even exact outfits from the tagged brands in the post. When traced, customers' social behavior can be a very useful guide for online shopping websites, providing insights on the styles the customers are really interested in, and hence aiding the online shops in offering better recommendations and facilitating customers quest for outfits. Another well known difficulty with recommendation of similar items is the large quantities of clothing items which can be considered similar, but belong to different brands. Relying only on implicit customer behavioral data will not be sufficient in the coming future to distinguish between for recommendation that will lead to an item being purchased and kept, vs. a recommendation that might result in either the customer not following it, or eventually return the item. Finding the right size and fit for clothes is one of the major

factors not only impacting customers purchase decision, but also their satisfaction from e-commerce fashion platforms. Moreover, fashion articles have important sizing variations. Finally, customer preferences towards perceived article size and fit for their body remain highly personal and subjective which influences the definition of the right size for each customer. The combination of the above factors leaves the customers alone to face a highly challenging problem of determining the right size and fit during their purchase journey, which in turn has resulted in having more than one third of apparel returns to be caused by not ordering the right article size. This challenge presents a huge opportunity for research in intelligent size and fit recommendation systems and machine learning solutions with direct impact on both customer satisfaction and business profitability.

Recommender Systems for Medicine and Music - Zbigniew W. Ras 2021-04-07
Music recommendation systems are becoming more and more popular. The increasing amount of personal data left by users on social media contributes to more accurate inference of the user's musical preferences and the same to quality of personalized systems. Health recommendation systems have become indispensable tools in decision making processes in the healthcare sector. Their main objective is to ensure the availability of valuable information at the right time by ensuring information quality, trustworthiness, authentication, and privacy concerns. Medical doctors deal with various kinds of diseases in which the music therapy helps to improve symptoms. Listening to music may improve heart rate, respiratory rate, and blood pressure in people with heart disease. Sound healing therapy uses aspects of music to improve physical and emotional health and well-being. The book presents a variety of approaches useful to create recommendation systems in healthcare, music, and in music therapy.
Recommender Systems - Charu C. Aggarwal

2016-04-04
This book comprehensively covers the topic of recommender systems, which provide personalized recommendations of products or services to users based on their previous searches or purchases. Recommender system methods have been adapted to diverse applications including query log mining, social networking, news recommendations, and computational advertising. This book synthesizes both fundamental and advanced topics of a research area that has now reached maturity. The chapters of this book are organized into three categories: - Algorithms and evaluation: These chapters discuss the fundamental algorithms in recommender systems, including collaborative filtering methods, content-based methods, knowledge-based methods, ensemble-based methods, and evaluation. - Recommendations in specific domains and contexts: the context of a recommendation can be viewed as important side information that affects the recommendation goals. Different types of context such as temporal data, spatial data, social data, tagging data, and trustworthiness are explored. - Advanced topics and applications: Various robustness aspects of recommender systems, such as shilling systems, attack models, and their defenses are discussed. In addition, recent topics, such as learning to rank, multi-armed bandits, group systems, multi-criteria systems, and active learning systems, are introduced together with applications. Although this book primarily serves as a textbook, it will also appeal to industrial practitioners and researchers due to its focus on applications and references. Numerous examples and exercises have been provided, and a solution manual is available for instructors.
Statistical Methods for Recommender Systems - Deepak K. Agarwal 2016-02-24
This book provides an in-depth discussion of challenges encountered in deploying real-life large-scale systems and the state-of-the-art

solutions in personalization.

Recommender Systems Handbook - Francesco Ricci 2015-11-17
This second edition of a well-received text, with 20 new chapters, presents a coherent and unified repository of recommender systems' major concepts, theories, methodologies, trends, and challenges. A variety of real-world applications and detailed case studies are included. In addition to wholesale revision of the existing chapters, this edition includes new topics including: decision making and recommender systems, reciprocal recommender systems, recommender systems in social networks, mobile recommender systems, explanations for recommender systems, music recommender systems, cross-domain recommendations, privacy in recommender systems, and semantic-based recommender systems. This multi-disciplinary handbook involves world-wide experts from diverse fields such as artificial intelligence, human-computer interaction, information retrieval, data mining, mathematics, statistics, adaptive user interfaces, decision support systems, psychology, marketing, and consumer behavior. Theoreticians and practitioners from these fields will find this reference to be an invaluable source of ideas, methods and techniques for developing more efficient, cost-effective and accurate recommender systems.

Building a Recommendation System with R - Suresh K. Gorakala 2015-09-29
Learn the art of building robust and powerful recommendation engines using R About This Book Learn to exploit various data mining techniques Understand some of the most popular recommendation techniques This is a step-by-step guide full of real-world examples to help you build and optimize recommendation engines Who This Book Is For If you are a competent developer with some knowledge of machine learning and R, and want to further enhance your skills to build recommendation

systems, then this book is for you. What You Will Learn Get to grips with the most important branches of recommendation Understand various data processing and data mining techniques Evaluate and optimize the recommendation algorithms Prepare and structure the data before building models Discover different recommender systems along with their implementation in R Explore various evaluation techniques used in recommender systems Get to know about recommenderlab, an R package, and understand how to optimize it to build efficient recommendation systems In Detail A recommendation system performs extensive data analysis in order to generate suggestions to its users about what might interest them. R has recently become one of the most popular programming languages for the data analysis. Its structure allows you to interactively explore the data and its modules contain the most cutting-edge techniques thanks to its wide international community. This distinctive feature of the R language makes it a preferred choice for developers who are looking to build recommendation systems. The book will help you understand how to build recommender systems using R. It starts off by explaining the basics of data mining and machine learning. Next, you will be familiarized with how to build and optimize recommender models using R. Following that, you will be given an overview of the most popular recommendation techniques. Finally, you will learn to implement all the concepts you have learned throughout the book to build a recommender system. Style and approach This is a step-by-step guide that will take you through a series of core tasks. Every task is explained in detail with the help of practical examples.

Mining of Massive Datasets - Jure Leskovec 2014-11-13
Now in its second edition, this book focuses on practical algorithms for mining data from even the largest datasets.

Web Recommendations Systems - K. R.
Venugopal 2020-03-02
This book focuses on Web recommender
systems, offering an overview of approaches to
develop these state-of-the-art systems. It also
presents algorithmic approaches in the field of
Web recommendations by extracting knowledge
from Web logs, Web page content and
hyperlinks. Recommender systems have been
used in diverse applications, including query log
mining, social networking, news
recommendations and computational
advertising, and with the explosive growth of
Web content, Web recommendations have
become a critical aspect of all search engines.
The book discusses how to measure the
effectiveness of recommender systems,
illustrating the methods with practical case
studies. It strikes a balance between
fundamental concepts and state-of-the-art
technologies, providing readers with valuable
insights into Web recommender systems.

**Matrix and Tensor Factorization Techniques
for Recommender Systems** - Panagiotis
Symeonidis 2017-01-29
This book presents the algorithms used to
provide recommendations by exploiting matrix
factorization and tensor decomposition
techniques. It highlights well-known
decomposition methods for recommender
systems, such as Singular Value Decomposition
(SVD), UV-decomposition, Non-negative Matrix
Factorization (NMF), etc. and describes in detail
the pros and cons of each method for matrices
and tensors. This book provides a detailed
theoretical mathematical background of
matrix/tensor factorization techniques and a
step-by-step analysis of each method on the
basis of an integrated toy example that runs
throughout all its chapters and helps the reader
to understand the key differences among
methods. It also contains two chapters, where
different matrix and tensor methods are
compared experimentally on real data sets, such

as Epinions, GeoSocialRec, Last.fm, BibSonomy, etc. and provides further insights into the advantages and disadvantages of each method. The book offers a rich blend of theory and practice, making it suitable for students, researchers and practitioners interested in both recommenders and factorization methods. Lecturers can also use it for classes on data mining, recommender systems and dimensionality reduction methods.

Recommender Systems: Advanced Developments - Jie Lu 2020-08-04 Recommender systems provide users (businesses or individuals) with personalized online recommendations of products or information, to address the problem of information overload and improve personalized services. Recent successful applications of recommender systems are providing solutions to transform online services for e-government, e-business, e-commerce, e-shopping, e-library, e-learning, e-tourism, and more.This unique compendium not only describes theoretical research but also reports on new application developments, prototypes, and real-world case studies of recommender systems. The comprehensive volume provides readers with a timely snapshot of how new recommendation methods and algorithms can overcome challenging issues. Furthermore, the monograph systematically presents three dimensions of recommender systems — basic recommender system concepts, advanced recommender system methods, and real-world recommender system applications.By providing state-of-the-art knowledge, this excellent reference text will immensely benefit researchers, managers, and professionals in business, government, and education to understand the concepts, methods, algorithms and application developments in recommender systems.
Matrix and Tensor Factorization Techniques for Recommender Systems - Panagiotis Symeonidis 2016-09-25

This book presents the algorithms used to provide recommendations by exploiting matrix factorization and tensor decomposition techniques. It highlights well-known decomposition methods for recommender systems, such as Singular Value Decomposition (SVD), UV-decomposition, Non-negative Matrix Factorization (NMF), etc. and describes in detail the pros and cons of each method for matrices and tensors. This book provides a detailed theoretical mathematical background of matrix/tensor factorization techniques and a step-by-step analysis of each method on the basis of an integrated toy example that runs throughout all its chapters and helps the reader to understand the key differences among methods. It also contains two chapters, where different matrix and tensor methods are compared experimentally on real data sets, such as Epinions, GeoSocialRec, Last.fm, BibSonomy, etc. and provides further insights into the advantages and disadvantages of each method.

The book offers a rich blend of theory and practice, making it suitable for students, researchers and practitioners interested in both recommenders and factorization methods. Lecturers can also use it for classes on data mining, recommender systems and dimensionality reduction methods.

Collaborative Filtering Recommender Systems - Michael D. Ekstrand 2011 Recommender systems are an important part of the information and e-commerce ecosystem. They represent a powerful method for enabling users to filter through large information and product spaces. Nearly two decades of research on collaborative filtering have led to a varied set of algorithms and a rich collection of tools for evaluating their performance. Research in the field is moving in the direction of a richer understanding of how recommender technology may be embedded in specific domains. The differing personalities exhibited by different recommender algorithms show that

recommendation is not a one-size-fits-all problem. Specific tasks, information needs, and item domains represent unique problems for recommenders, and design and evaluation of recommenders needs to be done based on the user tasks to be supported. Effective deployments must begin with careful analysis of prospective users and their goals. Based on this analysis, system designers have a host of options for the choice of algorithm and for its embedding in the surrounding user experience. Collaborative Filtering Recommender Systems provides a broad overview of the current state of collaborative filtering research. It discusses the core algorithms for collaborative filtering and traditional means of measuring their performance against user rating data sets. It then moves on to discuss building reliable, accurate data sets; understanding recommender systems in the broader context of user information needs and task support; and the interaction between users and recommender systems. Collaborative Filtering Recommender Systems provides both practitioners and researchers with an introduction to the important issues underlying recommenders and current best practices for addressing these issues.

Personalization Techniques and Recommender Systems - Matthew Y. Ma 2008 The phenomenal growth of the Internet has resulted in huge amounts of online information, a situation that is overwhelming to the end users. To overcome this problem, personalization technologies have been extensively employed. The book is the first of its kind, representing research efforts in the diversity of personalization and recommendation techniques. These include user modeling, content, collaborative, hybrid and knowledge-based recommender systems. It presents theoretic research in the context of various applications from mobile information access, marketing and sales and web services, to library

and personalized TV recommendation systems. This volume will serve as a basis to researchers who wish to learn more in the field of recommender systems, and also to those intending to deploy advanced personalization techniques in their systems. Sample Chapter(s). Personalization-Privacy Tradeoffs in Adaptive Information Access (865 KB). Contents: User Modeling and Profiling: Personalization-Privacy Tradeoffs in Adaptive Information Access (B Smyth); A Deep Evaluation of Two Cognitive User Models for Personalized Search (F Gasparetti & A Micarelli); Unobtrusive User Modeling for Adaptive Hypermedia (H J Holz et al.); User Modelling Sharing for Adaptive e-Learning and Intelligent Help (K Kabassi et al.); Collaborative Filtering: Experimental Analysis of Multiattribute Utility Collaborative Filtering on a Synthetic Data Set (N Manouselis & C Costopoulou); Efficient Collaborative Filtering in Content-Addressable Spaces (S Berkovsky et al.); Identifying and Analyzing User Model Information from Collaborative Filtering Datasets (J Griffith et al.); Content-Based Systems, Hybrid Systems and Machine Learning Methods: Personalization Strategies and Semantic Reasoning: Working in Tandem in Advanced Recommender Systems (Y Blanco-Fernindez et al.); Content Classification and Recommendation Techniques for Viewing Electronic Programming Guide on a Portable Device (J Zhu et al.); User Acceptance of Knowledge-Based Recommenders (A Felfernig et al.); Using Restricted Random Walks for Library Recommendations and Knowledge Space Exploration (M Franke & A Geyer-Schulz); An Experimental Study of Feature Selection Methods for Text Classification (G Uchyigit & K Clark). Readership: Researchers and graduate students in machine learning and databases/information science.

Recommender Systems in Fashion and Retail - Nima Dokoohaki 2021-03-23
This book includes the proceedings of the

second workshop on recommender systems in fashion and retail (2020), and it aims to present a state-of-the-art view of the advancements within the field of recommendation systems with focused application to e-commerce, retail, and fashion by presenting readers with chapters covering contributions from academic as well as industrial researchers active within this emerging new field. Recommender systems are often used to solve different complex problems in this scenario, such as product recommendations, or size and fit recommendations, and social media-influenced recommendations (outfits worn by influencers).
Recommender Systems - Dietmar Jannach 2010-09-30
In this age of information overload, people use a variety of strategies to make choices about what to buy, how to spend their leisure time, and even whom to date. Recommender systems automate some of these strategies with the goal of providing affordable, personal, and high-quality recommendations. This book offers an overview of approaches to developing state-of-the-art recommender systems. The authors present current algorithmic approaches for generating personalized buying proposals, such as collaborative and content-based filtering, as well as more interactive and knowledge-based approaches. They also discuss how to measure the effectiveness of recommender systems and illustrate the methods with practical case studies. The final chapters cover emerging topics such as recommender systems in the social web and consumer buying behavior theory. Suitable for computer science researchers and students interested in getting an overview of the field, this book will also be useful for professionals looking for the right technology to build real-world recommender systems.

Recommender System for Improving Customer Loyalty - Katarzyna Tarnowska 2019-03-19

This book presents the Recommender System for Improving Customer Loyalty. New and innovative products have begun appearing from a wide variety of countries, which has increased the need to improve the customer experience. When a customer spends hundreds of thousands of dollars on a piece of equipment, keeping it running efficiently is critical to achieving the desired return on investment. Moreover, managers have discovered that delivering a better customer experience pays off in a number of ways. A study of publicly traded companies conducted by Watermark Consulting found that from 2007 to 2013, companies with a better customer service generated a total return to shareholders that was 26 points higher than the S&P 500. This is only one of many studies that illustrate the measurable value of providing a better service experience. The Recommender System presented here addresses several important issues. (1) It provides a decision framework to help managers determine which actions are likely to have the greatest impact on the Net Promoter Score. (2) The results are based on multiple clients. The data mining techniques employed in the Recommender System allow users to "learn" from the experiences of others, without sharing proprietary information. This dramatically enhances the power of the system. (3) It supplements traditional text mining options. Text mining can be used to identify the frequency with which topics are mentioned, and the sentiment associated with a given topic. The Recommender System allows users to view specific, anonymous comments associated with actual customers. Studying these comments can provide highly accurate insights into the steps that can be taken to improve the customer experience. (4) Lastly, the system provides a sensitivity analysis feature. In some cases, certain actions can be more easily implemented than others. The Recommender System allows managers to "weigh" these actions and

determine which ones would have a greater impact.

Persuasive Recommender Systems - Kyung-Hyan Yoo 2012-08-16
Whether users are likely to accept the recommendations provided by a recommender system is of utmost importance to system designers and the marketers who implement them. By conceptualizing the advice seeking and giving relationship as a fundamentally social process, important avenues for understanding the persuasiveness of recommender systems open up. Specifically, research regarding influential factors in advice seeking relationships, which is abundant in the context of human-human relationships, can provide an important framework for identifying potential influence factors in recommender system context. This book reviews the existing literature on the factors in advice seeking relationships in the context of human-human, human-computer, and human-recommender system interactions. It concludes that many social cues that have been identified as influential in other contexts have yet to be implemented and tested with respect to recommender systems. Implications for recommender system research and design are discussed.

Recommendation Systems in Software Engineering - Martin P. Robillard 2014-04-30
With the growth of public and private data stores and the emergence of off-the-shelf data-mining technology, recommendation systems have emerged that specifically address the unique challenges of navigating and interpreting software engineering data. This book collects, structures and formalizes knowledge on recommendation systems in software engineering. It adopts a pragmatic approach with an explicit focus on system design, implementation, and evaluation. The book is divided into three parts: "Part I – Techniques" introduces basics for building recommenders in software engineering, including techniques for

collecting and processing software engineering data, but also for presenting recommendations to users as part of their workflow. "Part II – Evaluation" summarizes methods and experimental designs for evaluating recommendations in software engineering. "Part III – Applications" describes needs, issues and solution concepts involved in entire recommendation systems for specific software engineering tasks, focusing on the engineering insights required to make effective recommendations. The book is complemented by the webpage rsse.org/book, which includes free supplemental materials for readers of this book and anyone interested in recommendation systems in software engineering, including lecture slides, data sets, source code, and an overview of people, groups, papers and tools with regard to recommendation systems in software engineering. The book is particularly well-suited for graduate students and researchers building new recommendation systems for software engineering applications or in other high-tech fields. It may also serve as the basis for graduate courses on recommendation systems, applied data mining or software engineering. Software engineering practitioners developing recommendation systems or similar applications with predictive functionality will also benefit from the broad spectrum of topics covered.

Recommender Systems Handbook - Francesco Ricci 2010-10-21
The explosive growth of e-commerce and online environments has made the issue of information search and selection increasingly serious; users are overloaded by options to consider and they may not have the time or knowledge to personally evaluate these options. Recommender systems have proven to be a valuable way for online users to cope with the information overload and have become one of the most powerful and popular tools in electronic commerce. Correspondingly, various techniques

for recommendation generation have been proposed. During the last decade, many of them have also been successfully deployed in commercial environments. Recommender Systems Handbook, an edited volume, is a multi-disciplinary effort that involves world-wide experts from diverse fields, such as artificial intelligence, human computer interaction, information technology, data mining, statistics, adaptive user interfaces, decision support systems, marketing, and consumer behavior. Theoreticians and practitioners from these fields continually seek techniques for more efficient, cost-effective and accurate recommender systems. This handbook aims to impose a degree of order on this diversity, by presenting a coherent and unified repository of recommender systems' major concepts, theories, methodologies, trends, challenges and applications. Extensive artificial applications, a variety of real-world applications, and detailed case studies are included. Recommender Systems Handbook illustrates how this technology can support the user in decision-making, planning and purchasing processes. It works for well known corporations such as Amazon, Google, Microsoft and AT&T. This handbook is suitable for researchers and advanced-level students in computer science as a reference.

Practical Recommender Systems - Kim Falk 2019-01-18
Summary Online recommender systems help users find movies, jobs, restaurants-even romance! There's an art in combining statistics, demographics, and query terms to achieve results that will delight them. Learn to build a recommender system the right way: it can make or break your application! Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Recommender systems are everywhere, helping you find everything from movies to jobs, restaurants to hospitals, even

romance. Using behavioral and demographic data, these systems make predictions about what users will be most interested in at a particular time, resulting in high-quality, ordered, personalized suggestions. Recommender systems are practically a necessity for keeping your site content current, useful, and interesting to your visitors. About the Book Practical Recommender Systems explains how recommender systems work and shows how to create and apply them for your site. After covering the basics, you'll see how to collect user data and produce personalized recommendations. You'll learn how to use the most popular recommendation algorithms and see examples of them in action on sites like Amazon and Netflix. Finally, the book covers scaling problems and other issues you'll encounter as your site grows. What's inside How to collect and understand user behavior Collaborative and content-based filtering Machine learning algorithms Real-world examples in Python About the Reader Readers need intermediate programming and database skills. About the Author Kim Falk is an experienced data scientist who works daily with machine learning and recommender systems.

Practical Recommender Systems - Kim Falk

2019-02-02

Summary Online recommender systems help users find movies, jobs, restaurants-even romance! There's an art in combining statistics, demographics, and query terms to achieve results that will delight them. Learn to build a recommender system the right way: it can make or break your application! Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Recommender systems are everywhere, helping you find everything from movies to jobs, restaurants to hospitals, even romance. Using behavioral and demographic data, these systems make predictions about what users will be most interested in at a particular time, resulting in high-quality, ordered, personalized suggestions. Recommender systems are practically a necessity for keeping your site content current, useful, and interesting to your visitors. About the Book Practical Recommender Systems explains how recommender systems work and shows how to create and apply them for your site. After covering the basics, you'll see how to collect user data and produce personalized recommendations. You'll learn how to use the most popular recommendation algorithms and see examples of them in action on sites like Amazon and Netflix. Finally, the book covers scaling problems and other issues you'll encounter as your site grows. What's inside How to collect and understand user behavior Collaborative and content-based filtering Machine learning algorithms Real-world examples in Python About the Reader Readers need intermediate programming and database skills. About the Author Kim Falk is an experienced data scientist who works daily with machine learning and recommender systems. Table of Contents PART 1 - GETTING READY FOR RECOMMENDER SYSTEMS What is a recommender? User behavior and how to collect it Monitoring the system Ratings and how to

calculate them Non-personalized recommendations The user (and content) who came in from the cold PART 2 - RECOMMENDER ALGORITHMS Finding similarities among users and among content Collaborative filtering in the neighborhood Evaluating and testing your recommender Content-based filtering Finding hidden genres with matrix factorization Taking the best of all algorithms: implementing hybrid recommenders Ranking and learning to rank Future of recommender systems

Educational Recommender Systems and Technologies: Practices and Challenges - Santos, Olga C. 2011-12-31
Recommender systems have shown to be successful in many domains where information overload exists. This success has motivated research on how to deploy recommender systems in educational scenarios to facilitate access to a wide spectrum of information. Tackling open issues in their deployment is gaining importance as lifelong learning becomes a necessity of the current knowledge-based society. Although Educational Recommender Systems (ERS) share the same key objectives as recommenders for e-commerce applications, there are some particularities that should be considered before directly applying existing solutions from those applications. Educational Recommender Systems and Technologies: Practices and Challenges aims to provide a comprehensive review of state-of-the-art practices for ERS, as well as the challenges to achieve their actual deployment. Discussing such topics as the state-of-the-art of ERS, methodologies to develop ERS, and architectures to support the recommendation process, this book covers researchers interested in recommendation strategies for educational scenarios and in evaluating the impact of recommendations in learning, as well as academics and practitioners in the area of technology enhanced learning.

Predicting movie ratings and recommender systems - Arkadiusz Paterek 2012-06-19
A 195-page monograph by a top-1% Netflix Prize contestant. Learn about the famous machine learning competition. Improve your machine learning skills. Learn how to build recommender systems. What's inside:introduction to predictive modeling,a comprehensive summary of the Netflix Prize, the most known machine learning competition, with a $1M prize,detailed description of a top-50 Netflix Prize solution predicting movie ratings,summary of the most important methods published - RMSE's from different papers listed and grouped in one place,detailed analysis of matrix factorizations / regularized SVD,how to interpret the factorization results - new, most informative movie genres,how to adapt the algorithms developed for the Netflix Prize to calculate good quality personalized recommendations,dealing with the cold-start: simple content-based augmentation,description of two rating-based recommender systems,commentary on everything: novel and unique insights, know-how from over 9 years of practicing and analysing predictive modeling.

Hands-On Recommendation Systems with Python - Rounak Banik 2018-07-31
With Hands-On Recommendation Systems with Python, learn the tools and techniques required in building various kinds of powerful recommendation systems (collaborative, knowledge and content based) and deploying them to the web Key Features Build industry-standard recommender systems Only familiarity with Python is required No need to wade through complicated machine learning theory to use this book Book Description Recommendation systems are at the heart of almost every internet business today; from Facebook to Netflix to Amazon. Providing good recommendations, whether it's friends, movies, or groceries, goes a long way in defining user experience and enticing your customers to use your platform.

This book shows you how to do just that. You will learn about the different kinds of recommenders used in the industry and see how to build them from scratch using Python. No need to wade through tons of machine learning theory—you'll get started with building and learning about recommenders as quickly as possible.. In this book, you will build an IMDB Top 250 clone, a content-based engine that works on movie metadata. You'll use collaborative filters to make use of customer behavior data, and a Hybrid Recommender that incorporates content based and collaborative filtering techniques With this book, all you need to get started with building recommendation systems is a familiarity with Python, and by the time you're fnished, you will have a great grasp of how recommenders work and be in a strong position to apply the techniques that you will learn to your own problem domains. What you will learn Get to grips with the different kinds of recommender systems Master data-wrangling techniques using the pandas library Building an IMDB Top 250 Clone Build a content based engine to recommend movies based on movie metadata Employ data-mining techniques used in building recommenders Build industry-standard collaborative filters using powerful algorithms Building Hybrid Recommenders that incorporate content based and collaborative fltering Who this book is for If you are a Python developer and want to develop applications for social networking, news personalization or smart advertising, this is the book for you. Basic knowledge of machine learning techniques will be helpful, but not mandatory.
Recommender Systems for Learning - Nikos Manouselis 2012-08-28
Technology enhanced learning (TEL) aims to design, develop and test sociotechnical innovations that will support and enhance learning practices of both individuals and organisations. It is therefore an application domain that generally covers technologies that

support all forms of teaching and learning activities. Since information retrieval (in terms of searching for relevant learning resources to support teachers or learners) is a pivotal activity in TEL, the deployment of recommender systems has attracted increased interest. This brief attempts to provide an introduction to recommender systems for TEL settings, as well as to highlight their particularities compared to recommender systems for other application domains.