Bandit Algorithms For Website Optimization

????????delta??????????CDF??????????????????????????

Advances in artificial intelligence (AI) highlight the potential of this technology to affect productivity, growth, inequality, market power, innovation, and employment. This volume seeks to set the agenda for economic research on the impact of AI. It covers four broad themes: AI as a general purpose technology; the relationships between AI, growth, jobs, and inequality; regulatory responses to changes brought on by AI; and the effects of AI on the way economic research is conducted. It explores the economic influence of machine learning, the branch of computational statistics that has driven much of the recent excitement around AI, as well as the economic impact of robotics and automation and the potential economic consequences of a still-hypothetical artificial general intelligence. The volume provides frameworks for understanding the economic impact of AI and identifies a number of open research questions. Contributors: Daron Acemoglu, Massachusetts Institute of Technology Philippe Aghion, Collège de France Ajay Agrawal, University of Toronto Susan Athey, Stanford University James Bessen, Boston University School of Law Erik Brynjolfsson, MIT Sloan School of Management Colin F. Camerer, California Institute of Technology Judith Chevalier, Yale School of Management Iain M. Cockburn, Boston University Tyler Cowen, George Mason University Jason Furman, Harvard Kennedy School Patrick Francois, University of British Columbia Alberto Galasso, University of Toronto Joshua Gans, University of Toronto Avi Goldfarb, University of Toronto Austan Goolsbee, University of Chicago Booth School of Business Rebecca Henderson, Harvard Business School Ginger Zhe Jin, University of Maryland Benjamin F. Jones, Northwestern University Charles I. Jones, Stanford University Daniel Kahneman, Princeton University Anton Korinek, Johns Hopkins University Mara Lederman, University of Toronto Hong Luo, Harvard Business School John McHale, National University of Ireland Paul R. Milgrom, Stanford University Matthew Mitchell, University of Toronto Alexander Oettl, Georgia Institute of Technology Andrea Prat, Columbia Business School Manav Raj, New York University Pascual Restrepo, Boston University Daniel Rock, MIT Sloan School of Management Jeffrey D. Sachs, Columbia University Robert Seamans, New York University Scott Stern, MIT Sloan School of Management Betsey Stevenson, University of Michigan Joseph E. Stiglitz. Columbia University Chad Syverson, University of Chicago Booth School of Business Matt Taddy, University of Chicago Booth School of Business Steven Tadelis, University of California, Berkeley Manuel Trajtenberg, Tel Aviv University Daniel Trefler, University of Toronto Catherine Tucker, MIT Sloan School of Management Hal Varian, University of California, Berkeley

Learn the science of collecting information to make effective decisions Everyday decisions are made without the benefit of accurate information. Optimal Learning develops the needed principles for gathering information to make decisions, especially when collecting information is time-consuming and expensive. Designed for readers with an elementary background in probability and statistics, the book presents effective and practical policies illustrated in a wide range of applications, from energy, homeland security, and transportation to engineering, health, and business. This book covers the fundamental dimensions of a learning problem and presents a simple method for testing and comparing policies for learning. Special attention is given to the knowledge gradient policy and its use with a wide range of belief models, including lookup table and parametric and for online and offline problems. Three sections develop ideas with increasing levels of sophistication: Fundamentals explores fundamental topics, including adaptive learning, ranking and selection, the knowledge gradient, and bandit problems Extensions and Applications features coverage of linear belief models, subset selection models, scalar function optimization, optimal bidding, and stopping problems Advanced Topics explores complex methods including simulation optimization, active learning in mathematical

programming, and optimal continuous measurements Each chapter identifies a specific learning problem, presents the related, practical algorithms for implementation, and concludes with numerous exercises. A related website features additional applications and downloadable software, including MATLAB and the Optimal Learning Calculator, a spreadsheet-based package that provides an introduction to learning and a variety of policies for learning. ???Python??????????????? ?????????????????OpenAI Gym?TensorFlow???????RL??????????Markov??????????????????? ???DQN?DRQN?A3C?PPO?TRPO????????? ??????????????DQfD?HER????????????? ??????? ??????????????????????? ???OpenAI Gym?TensorFlow????? ???Markov?????Bellman????TD?? ????????????????????? ??????????????RNN?LSTM?CNN???? ???DRQN????????????????? ???DDPG????????????? ?????DQN?????????? #???? GOTOP

This book constitutes the refereed proceedings of the 11th European Conference on Evolutionary Computation in Combinatorial Optimization, EvoCOP 2011, held in Torino, Italy, in April 2011. The 22 revised full papers presented were carefully reviewed and selected from 42 submissions. The papers present the latest research and discuss current developments and applications in metaheuristics - a paradigm to effectively solve difficult combinatorial optimization problems appearing in various industrial, economical, and scientific domains. Prominent examples of metaheuristics are evolutionary algorithms, simulated annealing, tabu search, scatter search, memetic algorithms, variable neighborhood search, iterated local search, greedy randomized adaptive search procedures, estimation of distribution algorithms, and ant colony optimization.

While several market-leading companies have successfully transformed their business models by following data- and AI-driven paths, the vast majority have yet to reap the benefits. How can your business and analytics units gain a competitive advantage by capturing the full potential of this predictive revolution? This practical guide presents a battle-tested end-to-end method to help you translate business decisions into tractable prescriptive solutions using data and AI as fundamental inputs. Author Daniel Vaughan shows data scientists, analytics practitioners, and others interested in using AI to transform their businesses not only how to ask the right questions but also how to generate value using modern AI technologies and decision-making principles. You'll explore several use cases common to many enterprises, complete with examples you can apply when working to solve your own issues. Break business decisions into stages that can be tackled using different skills from the analytical toolbox Identify and embrace uncertainty in decision making and protect against common human biases Customize optimal decisions to different customers using predictive and prescriptive methods and technologies Ask business questions that create high value through AI- and data-driven technologies

???? R? ??? ??? ??? ???? ??? ?? ??? ??? ??? ?????, ??? ???? ?? ??? ??? ??? ?? ?? ???. ? ?? ??? ??? ???? ?? ?? ??? ??? ??? ?? ?? ????. 50?? ??? ???? ???? ??? ?????, ?? ?? ??? ??? ??? ? ??. 2??? ?? R ??? ???? ??? ??? ??? ????. ? ??? ??? ??? ????? ? ???? ?? ?? ??? ???? ???? ???. ?? ?? ??? ??? ??? ??? ??? ?? ???? ??????? ??? ??? ??? ????? ?? ?? ???? ??? ??? ??? ??? ???? ??? ?? ?? ?? ?????? ??? ???? ??? ???? ?? ??? ???? ???? ?? ?? ?? ???? ???? ??? ???? ?? ??? ?? ????? ??? ???? ??? ?? ?? ??? ?? ?? ???? ???? ????? ???? ???. ?? ??? ??? ??? ??? ??? ??? ???? ??? ?? ??. ??? ???? ??? ??. ??? ?? ???? ??? ???? ?? ?? ?????. _??? ????, ????? ?????? ?? ??????? ? ?? ??? ???? ?????? 50?? ?? ?? ???? R ??? ?????, ??? ??? ???! ?? ??? ???? ?? ??? ???? ?? ??? ????. ??? ??? ???? ????? ??? ???? ?? ?? ?????, ??? ??? ???? ?? ????? ???. ? ?? ?? ??? ??? ?? ??? ???? ???? ???? ?? ???. ??? ?? ? ???. ??, ??? ??? ??? ??? ?? ??? ???? ?? ?? ?? ?? ????. ??, ??? ??? ???? ?? ??? ?? ???? ????, ?? ??? ? ???? ??? ?? ??. EDA, ????, ??? ??, ????, ??, ??? ????, ??? ?? ? ??? ??? ??? ???? ???? ?? ???? ??? ????, ??? ???? ? ??? ?? ??? 50? ??? '?' ?? ????. ???, p ?, ???? ? ?? ???? ???? ???? ?? ?, ????? ??? ??? ???? ?? ???? ??? ?

??? ?? ?? ?? ?? ????. ?? ??? '?? ??'? '?? ??'? ??? ?? ??? ???, ?? ???? ???, ??? ??, ??? ???? ??? ??? ?? ???? ? ???? ????. 2?? ?? ? ??? ?? ???? ??? ???. ??? ??? ?? ?? ?? ??? ??? ?? ???? 30? ??? ??? ?? ??? ?? ????. ????? R, ? ? ??? ?? ? ??? ?? ??? ???? ??? ???? ? ??. ?? ?? ? ??? ? ?? ?? ?? ??? ???? ??? ??? ???. ??? ??? ???? ???? ?? ??? ??? ???? ??? ??? ? ???, ? ?? ???? ?? ?? ??? ??? ???? ???? ???. ??? ? ?? ??? ? ???, ??? ??? ????? ? ???? ?? ?? ??? ???? ??? ? ??. ???????????????????????????????????,???????????,??????????????????????

Reinforcement learning (RL) will deliver one of the biggest breakthroughs in AI over the next decade, enabling algorithms to learn from their environment to achieve arbitrary goals. This exciting development avoids constraints found in traditional machine learning (ML) algorithms. This practical book shows data science and AI professionals how to learn by reinforcementand enable a machine to learn by itself. Author Phil Winder of Winder Research covers everything from basic building blocks to state-of-the-art practices. You'll explore the current state of RL, focus on industrial applications, learnnumerous algorithms, and benefit from dedicated chapters on deploying RL solutions to production. This is no cookbook; doesn't shy away from math and expects familiarity with ML. Learn what RL is and how the algorithms help solve problems Become grounded in RL fundamentals including Markov decision processes, dynamic programming, and temporal difference learning Dive deep into a range of value and policy gradient methods Apply advanced RL solutions such as meta learning, hierarchical learning, multi-agent, and imitation learning Understand cutting-edge deep RL algorithms including Rainbow, PPO, TD3, SAC, and more Get practical examples through the accompanying website

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.

Machine learning has become an integral part of many commercial applications and research projects, but this field is not exclusive to large companies with extensive research teams. If you use Python, even as a beginner, this book will teach you practical ways to build your own machine learning solutions. With all the data available today, machine learning applications are limited only by your imagination. You'll learn the steps necessary to create a successful machine-learning application with Python and the scikit-learn library. Authors Andreas Müller and Sarah Guido focus on the practical aspects of using machine learning algorithms, rather than the math behind them. Familiarity with the NumPy and matplotlib libraries will help you get even more from this book. With this book, you'll learn: Fundamental concepts and applications of machine learning Advantages and shortcomings of widely used machine learning algorithms How to represent data processed by machine learning, including which data aspects to focus on Advanced methods for model evaluation and parameter tuning The concept of pipelines for chaining models and encapsulating your workflow Methods for working with text data, including text-specific processing techniques Suggestions for improving your machine learning and data science skills

Many analysts are too concerned with tools and techniques for cleansing, modeling, and visualizing datasets and not concerned enough with asking the right questions. In this practical guide, data strategy consultant Max Shron shows you how to put the why before the how, through an often-overlooked set of analytical skills. Thinking with Data helps you learn techniques for turning data into knowledge you can use. You'll learn a framework for defining your project, including the data you want to collect, and how you intend to approach, organize, and analyze the results. You'll also learn patterns of reasoning that will help you unveil the real problem that needs to be solved. Learn a framework for scoping data projects Understand how to pin down the details of an idea, receive feedback, and begin prototyping Use the tools of arguments to ask good questions, build projects in stages, and communicate results Explore data-specific patterns of reasoning and learn how to build more useful arguments Delve into causal reasoning and learn how it permeates data work Put everything together, using extended examples to see the method of full problem thinking in action

Statistical methods are a key part of data science, yet few data scientists have formal statistical training. Courses and books on basic statistics rarely cover the topic from a data science perspective. The second edition of this popular guide adds comprehensive examples in Python, provides practical guidance on applying statistical methods to data science, tells you how to avoid their misuse, and gives you advice on what's important and what's not. Many data science resources incorporate statistical methods but lack a deeper statistical perspective. If you're familiar with the R or Python programming languages and

have some exposure to statistics, this quick reference bridges the gap in an accessible, readable format. With this book, you'll learn: Why exploratory data analysis is a key preliminary step in data science How random sampling can reduce bias and yield a higher-quality dataset, even with big data How the principles of experimental design yield definitive answers to questions How to use regression to estimate outcomes and detect anomalies Key classification techniques for predicting which categories a record belongs to Statistical machine learning methods that "learn" from data Unsupervised learning methods for extracting meaning from unlabeled data

The significantly expanded and updated new edition of a widely used text on reinforcement learning, one of the most active research areas in artificial intelligence. Reinforcement learning, one of the most active research areas in artificial intelligence, is a computational approach to learning whereby an agent tries to maximize the total amount of reward it receives while interacting with a complex, uncertain environment. In Reinforcement Learning, Richard Sutton and Andrew Barto provide a clear and simple account of the field's key ideas and algorithms. This second edition has been significantly expanded and updated, presenting new topics and updating coverage of other topics. Like the first edition, this second edition focuses on core online learning algorithms, with the more mathematical material set off in shaded boxes. Part I covers as much of reinforcement learning as possible without going beyond the tabular case for which exact solutions can be found. Many algorithms presented in this part are new to the second edition, including UCB, Expected Sarsa, and Double Learning. Part II extends these ideas to function approximation, with new sections on such topics as artificial neural networks and the Fourier basis, and offers expanded treatment of off-policy learning and policy-gradient methods. Part III has new chapters on reinforcement learning's relationships to psychology and neuroscience, as well as an updated case-studies chapter including AlphaGo and AlphaGo Zero, Atari game playing, and IBM Watson's wagering strategy. The final chapter discusses the future societal impacts of reinforcement learning.

This book constitutes the joint refereed proceedings of the 13 International Conference on Next Generation Teletraffic and Wired/Wireless Advanced Networking, NEW2AN, and the 6th Conference on Internet of Things and Smart Spaces, ruSMART 2013, held in St. Petersburg, Russia, in August 2013. The total of 38 papers was carefully reviewed and selected for inclusion in this book. The 14 papers selected from ruSMART are organized in topical sections named: internet on things, smart spaces technologies; and smart systems. The 24 papers from NEW2AN deal with the following topics: performance and efficiency analysis, network and transport layer issues; cognitive radio networks; sensor and mesh networks; upper layer protocols and applications; ad-hoc, cellular and satellite networks.

This book constitutes the refereed proceedings of the 13th European Conference on Software Architecture, ECSA 2019, held in Paris, France, in September 2019. In the Research Track, 11 full papers presented together with 4 short papers were carefully reviewed and selected from 63 submissions. They are organized in topical sections as follows: Services and Micro-services, Software Architecture in Development Process, Adaptation and Design Space Exploration, and Quality Attributes. In the Industrial Track, 6 submissions were received and 3

were accepted to form part of these proceedings.

????? ????????? ?? ??????????? ? ??????? Data Science, ????????? ????????? ??????
?????? ? ?????? ??????????????? R ? ??????? ?????????????? ?????? ? ??????????????
??????????. ? ??? ? ?????? ? ????????????? ????? ??????????? ???????? ??????? ??
??????????, ??????? ????????? ? ????? ? ??????, ? ????? ?????????, ????? ??????? ????? ?
??????? ? ????? ?????? ????? ? ??????, ????? ????? ????? ? ??????. ???????? ????????
????: ??????????? ?????? ??????, ????????????? ?????? ? ???????, ??????????????
??????????? ? ???????? ??????????, ????????? ? ???????????, ????????????,
?????????????? ???????? ???????? ? ???????? ??? ???????. "...??? ????? ?? ???????? ??
????????? ????????? ?? ??????????, ?? ??????????? ?? ?????-???? ????????. ??? ???????
?????, ????????? ???????? ?????????? ????? ????? ????????? ??????????????? ????????? ?
??????????, ? ????? ???????, ? ??????????? ?????????-???? ??????????? ? ????????
?????????? ??????? ??????, ? ??????, ????? ????? ???????-??? ? ??????? ??????????
????????. ??? ??????????? ?????????? ??? ???????? ? ??????-?????? ????? ? ??????...". -
????? ?????? ????? ?????????? ????? ????????? ?????? ?????? ??? ??????? ????????? (Data
Mining for Business Analytics) ? ???????? ????????? ???????????? ???????????? ???????,
???????

The three volume set LNAI 9851, LNAI 9852, and LNAI 9853 constitutes the refereed
proceedings of the European Conference on Machine Learning and Knowledge Discovery in
Databases, ECML PKDD 2016, held in Riva del Garda, Italy, in September 2016. The 123 full
papers and 16 short papers presented were carefully reviewed and selected from a total of 460
submissions. The papers presented focus on practical and real-world studies of machine
learning, knowledge discovery, data mining; innovative prototype implementations or mature
systems that use machine learning techniques and knowledge discovery processes in a real
setting; recent advances at the frontier of machine learning and data mining with other
disciplines. Part I and Part II of the proceedings contain the full papers of the contributions
presented in the scientific track and abstracts of the scientific plenary talks. Part III contains the
full papers of the contributions presented in the industrial track, short papers describing
demonstration, the nectar papers, and the abstracts of the industrial plenary talks.

????Web 2.0??Web???????????,???????????,?????,?????????????,?????????.?????????
??,????Ajax,CSS,JavaScript,Flash??????????,????????????????.

Featuring interviews with topflight scholars discussing their work and that of their colleagues,
this retrospective of the first hundred years of Columbia Business School recounts the role of
the preeminent institution in transforming education, industry, and global society. From its early
years as the birthplace of value investing to its seminal influence on Warren Buffett and
Benjamin Graham, the school has been a profound incubator of ideas and talent, determining
the direction of American business. In ten chapters, each representing a single subject of the
school's research, senior faculty members recount the collaborative efforts and innovative
approaches that led to revolutionary business methods in fields like finance, economics, and
accounting. They describe the pioneering work that helped create new quantitative and
stochastic tools to enhance corporate decision making, and they revisit the groundbreaking
twentieth-century marketing and management paradigms that continue to affect the
fundamentals of global business. The volume profiles several prominent centers and programs
that have helped the school adapt to recent advancements in international business,
entrepreneurship, and social enterprise. Columbia Business School has long offered its diverse
students access to the best leaders and thinkers in the industry. This book not only reflects on
these relationships but also imagines what might be accomplished in the next hundred years.

??? ?? ???? ?? ?? ???, ? ??? ???? ???? ????? ?? ???? ???. ??? ??? ???? ?? ???? ???? ?? ????
??? ??? ???? ????. ??? ???? ?? ??? ??? ??? ???? ??? ??? ? ???? ???? ???? ???? ???. ?? ??? ??
??? ??? ?? ??? ??????. ? ???? ?? ???? ??? ??? ?? ?? ?? ???. ? ???? ????? ??? ?? ??? ? ???

???? ??? ???? ???? ??? ??? ?? ????. ????? ??? ??? ???? ???? ?? ??? ???? ?? ???? ???? ?? ?????. ??? ???? ? ??? ???? ???? ?? ??? ???? ?????. ???? ??? ?? ???? ?? ???? ? ? ??? ????, ?? ?? ??? ??? ??? ??? ??? ?? ???? ?? ???? ??? ????. ?? A/B ???? ???? ??? ??? ?????. A/B ????? ??? ??? ???? ???? ??? ? ??? ??? ???? ?? ??? ??? ? ?? ??? ??? ??? ? ?? ????. ???? ??? ??? ?? ? ??? ??? ????? ??? ?? ??? ?????. ? ?? ???? ??????? ??? ??? ??? ???? ???? ??? ?? ????? ?? ?? ??????. ? ???? ?? ??? ? ?? ??? ????. ??? ?? ?? ?? ?? ?? ?? ???? ??? ????? ?? ???? ??, ?? ?? ?? ??? ???? ?? ??? ??, ?????? ?? ???? ??(MAB)? ? ?? ??? ???? ??? ??? ?? ??? ? ????? ???? ?? ???

???????????,??????,??

The three-volume set constitutes the proceedings of the 16th International Conference on Wireless Algorithms, Systems, and Applications, WASA 2021, which was held during June 25-27, 2021. The conference took place in Nanjing, China.The 103 full and 57 short papers presented in these proceedings were carefully reviewed and selected from 315 submissions. The contributions in Part II of the set are subdivided into the following topical sections: Scheduling & Optimization II; Security; Data Center Networks and Cloud Computing; Privacy-Aware Computing; Internet of Vehicles; Visual Computing for IoT; Mobile Ad-Hoc Networks. When looking for ways to improve your website, how do you decide which changes to make? And which changes to keep? This concise book shows you how to use Multiarmed Bandit algorithms to measure the real-world value of any modifications you make to your site. Author John Myles White shows you how this powerful class of algorithms can help you boost website traffic, convert visitors to customers, and increase many other measures of success. This is the first developer-focused book on bandit algorithms, which were previously described only in research papers. You'll quickly learn the benefits of several simple algorithms—including the epsilon-Greedy, Softmax, and Upper Confidence Bound (UCB) algorithms—by working through code examples written in Python, which you can easily adapt for deployment on your own website. Learn the basics of A/B testing—and recognize when it's better to use bandit algorithms Develop a unit testing framework for debugging bandit algorithms Get additional code examples written in Julia, Ruby, and JavaScript with supplemental online materials The three volume set LNAI 9284, 9285, and 9286 constitutes the refereed proceedings of the European Conference on Machine Learning and Knowledge Discovery in Databases, ECML PKDD 2015, held in Porto, Portugal, in September 2015. The 131 papers presented in these proceedings were carefully reviewed and selected from a total of 483 submissions. These include 89 research papers, 11 industrial papers, 14 nectar papers, 17 demo papers. They were organized in topical sections named: classification, regression and supervised learning; clustering and unsupervised learning; data preprocessing; data streams and online learning; deep learning; distance and metric learning; large scale learning and big data; matrix and tensor analysis; pattern and sequence mining; preference learning and label ranking; probabilistic, statistical, and graphical approaches; rich data; and social and graphs. Part III is structured in industrial track, nectar track, and demo track.
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?

This book constitutes the refereed proceedings of the 22nd International Conference on Algorithmic Learning Theory, ALT 2011, held in Espoo, Finland, in October 2011, co-located with the 14th International Conference on Discovery Science, DS 2011. The 28 revised full papers presented together with the abstracts of 5 invited talks were carefully reviewed and selected from numerous submissions. The papers are divided into topical sections of papers on inductive inference, regression, bandit problems, online learning, kernel and margin-based methods, intelligent agents and other learning models.

???????????? ??????????????????????? ??????????????????? ??????????????????? ??????????????????????? ??? ??? ??????? ??? ??? ?????? ??? ?? ???……???

Longitudinal studies have traditionally been seen as too cumbersome and labor-intensive to be of much use in research on Human-Computer Interaction (HCI). However, recent trends in market, legislation, and the research questions we address, have highlighted the importance of studying prolonged use, while technology itself has made longitudinal research more accessible to researchers across different application domains. Aimed as an educational resource for graduate students and researchers in HCI, this book brings together a collection of chapters, addressing theoretical and methodological considerations, and presenting case studies of longitudinal HCI research. Among others, the authors: discuss the theoretical underpinnings of longitudinal HCI research, such as when a longitudinal study is appropriate, what research questions can be addressed and what challenges are entailed in different longitudinal research designs reflect on methodological challenges in longitudinal data collection and analysis, such as how to maintain participant adherence and data reliability when employing the Experience Sampling Method in longitudinal settings, or how to cope with data collection fatigue and data safety in applications of autoethnography and autobiographical design, which may span from months to several years present a number of case studies covering different topics of longitudinal HCI research, from "low technology" to self-tracking, to mid-air haptic feedback, and crowdsourcing.

Bandit Algorithms for Website Optimization"O'Reilly Media, Inc."

???????????????,???????,???????,????,????,??,??,?????,???,?????,?????,????,???,???,????????,??????????????????.