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"A First Course in Machine Learning by Simon Rogers and Mark Girolami is the best introductory book for ML currently available. It combines rigor and precision with accessibility, starts from a detailed explanation of the basic foundations of Bayesian analysis in the simplest of settings, and goes

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all the way to the frontiers of the subject such as infinite mixture models, GPs, and MCMC." –Devdatt Dubhashi, Professor, Department of Computer Science and Engineering, Chalmers University, Sweden "This textbook manages to be easier to read than other comparable books in the subject while retaining all the rigorous treatment needed. The new chapters put it at the forefront of the field by covering topics that have

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become mainstream in machine learning over the last decade." –Daniel Barbara, George Mason University, Fairfax, Virginia, USA "The new edition of A First Course in Machine Learning by Rogers and Girolami is an excellent introduction to the use of statistical methods in machine learning. The book introduces concepts such as mathematical modeling, inference, and prediction, providing 'just in time' the essential background on linear

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algebra, calculus, and probability theory that the reader needs to understand these concepts." –Daniel Ortiz-Arroyo, Associate Professor, Aalborg University Esbjerg, Denmark "I was impressed by how closely the material aligns with the needs of an introductory course on machine learning, which is its greatest strength...Overall, this is a pragmatic and helpful book, which is well-aligned to the needs of an introductory course

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and one that I will be looking at for my own students in coming months."

—David Clifton, University of Oxford, UK "The first edition of this book was already an excellent introductory text on machine learning for an advanced undergraduate or taught masters level course, or indeed for anybody who wants to learn about an interesting and important field of computer science. The additional chapters of advanced material on Gaussian process, MCMC and

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mixture modeling provide an ideal basis for practical projects, without disturbing the very clear and readable exposition of the basics contained in the first part of the book." –Gavin Cawley, Senior Lecturer, School of Computing Sciences, University of East Anglia, UK "This book could be used for junior/senior undergraduate students or first-year graduate students, as well as individuals who want to explore the field of machine learning...The book

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introduces not only the concepts but the underlying ideas on algorithm implementation from a critical thinking perspective." –Guangzhi Qu, Oakland University, Rochester, Michigan, USA

Machine learning is one of the fastest growing areas of computer science, with far-reaching applications. The aim of this textbook is to introduce machine learning, and the algorithmic paradigms it offers, in a principled way. The book provides an extensive theoretical

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account of the fundamental ideas underlying machine learning and the mathematical derivations that transform these principles into practical algorithms. Following a presentation of the basics of the field, the book covers a wide array of central topics that have not been addressed by previous textbooks. These include a discussion of the computational complexity of learning and the concepts of convexity and stability; important

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algorithmic paradigms including stochastic gradient descent, neural networks, and structured output learning; and emerging theoretical concepts such as the PAC-Bayes approach and compression-based bounds. Designed for an advanced undergraduate or beginning graduate course, the text makes the fundamentals and algorithms of machine learning accessible to students and nonexpert readers in statistics, computer science,

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mathematics, and engineering.

A concise overview of machine learning—computer programs that learn from data—which underlies applications that include recommendation systems, face recognition, and driverless cars. Today, machine learning underlies a range of applications we use every day, from product recommendations to voice recognition—as well as some we don't yet use everyday, including driverless cars. It is the basis of the new

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approach in computing where we do not write programs but collect data; the idea is to learn the algorithms for the tasks automatically from data. As computing devices grow more ubiquitous, a larger part of our lives and work is recorded digitally, and as "Big Data" has gotten bigger, the theory of machine learning—the foundation of efforts to process that data into knowledge—has also advanced. In this book, machine learning expert Ethem

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Alpaydin offers a concise overview of the subject for the general reader, describing its evolution, explaining important learning algorithms, and presenting example applications.

Alpaydin offers an account of how digital technology advanced from number-crunching mainframes to mobile devices, putting today's machine learning boom in context. He describes the basics of machine learning and some applications; the use of machine learning algorithms

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for pattern recognition; artificial neural networks inspired by the human brain; algorithms that learn associations between instances, with such applications as customer segmentation and learning recommendations; and reinforcement learning, when an autonomous agent learns act so as to maximize reward and minimize penalty. Alpaydin then considers some future directions for machine learning and the new field of

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"data science," and discusses the ethical and legal implications for data privacy and security.

A practical introduction perfect for final-year undergraduate and graduate students without a solid background in linear algebra and calculus.

Python Machine Learning

Reliable Face Recognition Methods

Case Studies and Algorithms to Get You Started

Artificial Intelligence in Asset

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Management

Data Science

A comprehensive review of an area of machine learning that deals with the use of unlabeled data in classification problems: state-of-the-art algorithms, a taxonomy of the field, applications, benchmark experiments, and directions for future research. In the field of machine learning, semi-supervised learning (SSL) occupies the middle ground, between supervised learning (in which all training examples are labeled) and unsupervised learning (in which no label data are given). Interest in SSL has increased in recent years, particularly because of application domains in which unlabeled data are plentiful, such as images, text, and

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bioinformatics. This first comprehensive overview of SSL presents state-of-the-art algorithms, a taxonomy of the field, selected applications, benchmark experiments, and perspectives on ongoing and future research. Semi-Supervised Learning first presents the key assumptions and ideas underlying the field: smoothness, cluster or low-density separation, manifold structure, and transduction. The core of the book is the presentation of SSL methods, organized according to algorithmic strategies. After an examination of generative models, the book describes algorithms that implement the low-density separation assumption, graph-based methods, and algorithms that perform two-step learning. The book then discusses SSL applications and offers guidelines for SSL practitioners by analyzing the results

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of extensive benchmark experiments. Finally, the book looks at interesting directions for SSL research. The book closes with a discussion of the relationship between semi-supervised learning and transduction.

This book covers the field of machine learning, which is the study of algorithms that allow computer programs to automatically improve through experience. The book is intended to support upper level undergraduate and introductory level graduate courses in machine learning. A concise introduction to the emerging field of data science, explaining its evolution, relation to machine learning, current uses, data infrastructure issues, and ethical challenges. The goal of data science is to improve decision making through the analysis of data. Today data science determines the ads

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we see online, the books and movies that are recommended to us online, which emails are filtered into our spam folders, and even how much we pay for health insurance. This volume in the MIT Press Essential Knowledge series offers a concise introduction to the emerging field of data science, explaining its evolution, current uses, data infrastructure issues, and ethical challenges. It has never been easier for organizations to gather, store, and process data. Use of data science is driven by the rise of big data and social media, the development of high-performance computing, and the emergence of such powerful methods for data analysis and modeling as deep learning. Data science encompasses a set of principles, problem definitions, algorithms, and processes for extracting non-obvious and useful patterns from large

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datasets. It is closely related to the fields of data mining and machine learning, but broader in scope. This book offers a brief history of the field, introduces fundamental data concepts, and describes the stages in a data science project. It considers data infrastructure and the challenges posed by integrating data from multiple sources, introduces the basics of machine learning, and discusses how to link machine learning expertise with real-world problems. The book also reviews ethical and legal issues, developments in data regulation, and computational approaches to preserving privacy. Finally, it considers the future impact of data science and offers principles for success in data science projects. Introduces machine learning and its algorithmic paradigms, explaining the principles behind automated learning

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approaches and the considerations underlying their usage.

Machine Learning For Dummies

A Probabilistic Perspective

Introduction to Online Convex Optimization, second edition

Introduction to Machine Learning, fourth edition

Machine Learning, revised and updated edition

This textbook presents a concise, accessible and engaging first introduction to deep learning, offering a wide range of connectionist models which represent the current state-of-the-art. The text explores the most popular algorithms and architectures in a simple and intuitive style, explaining the

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mathematical derivations in a step-by-step manner. The content coverage includes convolutional networks, LSTMs, Word2vec, RBMs, DBNs, neural Turing machines, memory networks and autoencoders. Numerous examples in working Python code are provided throughout the book, and the code is also supplied separately at an accompanying website. Topics and features: introduces the fundamentals of machine learning, and the mathematical and computational prerequisites for deep

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learning; discusses feed-forward neural networks, and explores the modifications to these which can be applied to any neural network; examines convolutional neural networks, and the recurrent connections to a feed-forward neural network; describes the notion of distributed representations, the concept of the autoencoder, and the ideas behind language processing with deep learning; presents a brief history of artificial intelligence and neural networks, and reviews interesting open research problems in deep

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learning and connectionism. This clearly written and lively primer on deep learning is essential reading for graduate and advanced undergraduate students of computer science, cognitive science and mathematics, as well as fields such as linguistics, logic, philosophy, and psychology.

Fundamental theory and practical algorithms of weakly supervised classification, emphasizing an approach based on empirical risk minimization. Standard machine learning techniques require large amounts of labeled

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data to work well. When we apply machine learning to problems in the physical world, however, it is extremely difficult to collect such quantities of labeled data. In this book Masashi Sugiyama, Han Bao, Takashi Ishida, Nan Lu, Tomoya Sakai and Gang Niu present theory and algorithms for weakly supervised learning, a paradigm of machine learning from weakly labeled data. Emphasizing an approach based on empirical risk minimization and drawing on state-of-the-art research in weakly supervised learning, the

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book provides both the fundamentals of the field and the advanced mathematical theories underlying them. It can be used as a reference for practitioners and researchers and in the classroom. The book first mathematically formulates classification problems, defines common notations, and reviews various algorithms for supervised binary and multiclass classification. It then explores problems of binary weakly supervised classification, including positive-unlabeled (PU) classification, positive-

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negative-unlabeled (PNU) classification, and unlabeled-unlabeled (UU) classification. It then turns to multiclass classification, discussing complementary-label (CL) classification and partial-label (PL) classification. Finally, the book addresses more advanced issues, including a family of correction methods to improve the generalization performance of weakly supervised learning and the problem of class-prior estimation.

How deep learning—from Google Translate to

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driverless cars to personal cognitive assistants—is changing our lives and transforming every sector of the economy. The deep learning revolution has brought us driverless cars, the greatly improved Google Translate, fluent conversations with Siri and Alexa, and enormous profits from automated trading on the New York Stock Exchange. Deep learning networks can play poker better than professional poker players and defeat a world champion at Go. In this book, Terry Sejnowski explains how deep learning went

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from being an arcane academic field to a disruptive technology in the information economy. Sejnowski played an important role in the founding of deep learning, as one of a small group of researchers in the 1980s who challenged the prevailing logic-and-symbol based version of AI. The new version of AI Sejnowski and others developed, which became deep learning, is fueled instead by data. Deep networks learn from data in the same way that babies experience the world, starting with fresh eyes and gradually

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acquiring the skills needed to navigate novel environments. Learning algorithms extract information from raw data; information can be used to create knowledge; knowledge underlies understanding; understanding leads to wisdom. Someday a driverless car will know the road better than you do and drive with more skill; a deep learning network will diagnose your illness; a personal cognitive assistant will augment your puny human brain. It took nature many millions of years to evolve human intelligence; AI is on a

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trajectory measured in decades. Sejnowski prepares us for a deep learning future. If you are looking for a comprehensive guide that explains in a simple way how to manage machine learning and AI, please keep reading. What do you need to learn to move from being a complete beginner to someone with advanced knowledge of machine learning? Have you ever wondered how to leverage big data from big tech companies (Google, Facebook e Amazon) to reach your objectives? Do you want to understand which

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ones are the best libraries to use and why is Python considered the best language for machine learning? The term Machine Learning refers to the capability of a machine to learn something without any pre existing program. Automatic learning is a way to educate an algorithm to learn from various environmental situations. Machine learning involves the usage of enormous quantities of data and an efficient algorithm enabled to adapt and enhance its capabilities according to recurring situations. From banking

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operations to online shopping and also on social media, we daily use machine learning data algorithms to make our experience more efficient, simple and secure. Machine learning and its capabilities are rapidly becoming popular - we have just discovered part of its potential. This bundle will give you all the information you need in order to leverage your knowledge and give you an excellent level of education. All the subjects will be supported by examples and practical exercises that will enable you to reinforce

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your level of knowledge Specifically you will learn What does Machine Learning and Artificial Intelligence mean Machine Learning evolution Machine learning applications Difference between AI and Machine Learning Big Data Connection between Machine Learning and Big Data How to use Big Data from large size companies to make your business scalable How to acquire new customers via simple marketing strategies Python Programming Advanced programming techniques and much more. This manual has

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been written to meet all levels of education. If your level of knowledge is low and you don't have any previous experience, this book will empower you to learn key functionalities and navigate through various subjects smoothly. If you have already a good understanding, you will find useful insights that will help to enhance your competences. If you want to learn Machine Learning but don't know where to start... Buy Now to get started!
Introduction to Machine Learning
Introduction to Natural Language Processing

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Deep Learning

Elements of Causal Inference

The rapid advancement in the theoretical understanding of statistical and machine learning methods for semisupervised learning has made it difficult for nonspecialists to keep up to date in the field. Providing a broad, accessible treatment of the theory as well as linguistic applications, *Semisupervised Learning for Computational Linguistics* offers self-contained coverage of semisupervised methods that includes background material on supervised and unsupervised learning. The book presents a brief history of semisupervised learning and its place in the spectrum of learning methods

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before moving on to discuss well-known natural language processing methods, such as self-training and co-training. It then centers on machine learning techniques, including the boundary-oriented methods of perceptrons, boosting, support vector machines (SVMs), and the null-category noise model. In addition, the book covers clustering, the expectation-maximization (EM) algorithm, related generative methods, and agreement methods. It concludes with the graph-based method of label propagation as well as a detailed discussion of spectral methods. Taking an intuitive approach to the material, this lucid book facilitates the application of semisupervised learning methods to natural language processing and provides the framework and motivation for a more systematic study of machine learning.

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New edition of a graduate-level textbook on that focuses on online convex optimization, a machine learning framework that views optimization as a process. In many practical applications, the environment is so complex that it is not feasible to lay out a comprehensive theoretical model and use classical algorithmic theory and/or mathematical optimization. Introduction to Online Convex Optimization presents a robust machine learning approach that contains elements of mathematical optimization, game theory, and learning theory: an optimization method that learns from experience as more aspects of the problem are observed. This view of optimization as a process has led to some spectacular successes in modeling and systems that have become part of our daily lives. Based on the “Theoretical

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Machine Learning” course taught by the author at Princeton University, the second edition of this widely used graduate level text features: Thoroughly updated material throughout New chapters on boosting, adaptive regret, and approachability and expanded exposition on optimization Examples of applications, including prediction from expert advice, portfolio selection, matrix completion and recommendation systems, SVM training, offered throughout Exercises that guide students in completing parts of proofs An accessible introduction to the artificial intelligence technology that enables computer vision, speech recognition, machine translation, and driverless cars. Deep learning is an artificial intelligence technology that enables computer vision, speech recognition in mobile phones, machine translation, AI

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games, driverless cars, and other applications. When we use consumer products from Google, Microsoft, Facebook, Apple, or Baidu, we are often interacting with a deep learning system. In this volume in the MIT Press Essential Knowledge series, computer scientist John Kelleher offers an accessible and concise but comprehensive introduction to the fundamental technology at the heart of the artificial intelligence revolution. Kelleher explains that deep learning enables data-driven decisions by identifying and extracting patterns from large datasets; its ability to learn from complex data makes deep learning ideally suited to take advantage of the rapid growth in big data and computational power. Kelleher also explains some of the basic concepts in deep learning, presents a history of advances in the field, and

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discusses the current state of the art. He describes the most important deep learning architectures, including autoencoders, recurrent neural networks, and long short-term networks, as well as such recent developments as Generative Adversarial Networks and capsule networks. He also provides a comprehensive (and comprehensible) introduction to the two fundamental algorithms in deep learning: gradient descent and backpropagation. Finally, Kelleher considers the future of deep learning—major trends, possible developments, and significant challenges.

The primary goal of this book is to provide a self-contained, comprehensive study of the main first-order methods that are frequently used in solving large-scale problems. First-order methods exploit information on values and

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gradients/subgradients (but not Hessians) of the functions composing the model under consideration. With the increase in the number of applications that can be modeled as large or even huge-scale optimization problems, there has been a revived interest in using simple methods that require low iteration cost as well as low memory storage. The author has gathered, reorganized, and synthesized (in a unified manner) many results that are currently scattered throughout the literature, many of which cannot be typically found in optimization books. First-Order Methods in Optimization offers comprehensive study of first-order methods with the theoretical foundations; provides plentiful examples and illustrations; emphasizes rates of convergence and complexity analysis of the main first-order methods used to

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solve large-scale problems; and covers both variables and functional decomposition methods.

Probabilistic Machine Learning

An Introduction

Vectors, Matrices, and Least Squares

Practical Machine Learning with Python

Lazy Learning

It's time to dispel the myth that machine learning is difficult. Grokking Machine Learning teaches you how to apply ML to your projects using only standard Python code and high school-level math. No specialist knowledge is required to

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tackle the hands-on exercises using readily available machine learning tools! In Grokking Machine Learning, expert machine learning engineer Luis Serrano introduces the most valuable ML techniques and teaches you how to make them work for you. Practical examples illustrate each new concept to ensure you're grokking as you go. You'll build models for spam detection, language analysis, and image recognition as you lock in each carefully-selected skill.

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Packed with easy-to-follow Python-based exercises and mini-projects, this book sets you on the path to becoming a machine learning expert. Key Features · Different types of machine learning, including supervised and unsupervised learning · Algorithms for simplifying, classifying, and splitting data · Machine learning packages and tools · Hands-on exercises with fully-explained Python code samples For readers with intermediate programming knowledge in

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Python or a similar language. About the technology Machine learning is a collection of mathematically-based techniques and algorithms that enable computers to identify patterns and generate predictions from data. This revolutionary data analysis approach is behind everything from recommendation systems to self-driving cars, and is transforming industries from finance to art.

A substantially revised fourth edition of

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a comprehensive textbook, including new coverage of recent advances in deep learning and neural networks. The goal of machine learning is to program computers to use example data or past experience to solve a given problem. Machine learning underlies such exciting new technologies as self-driving cars, speech recognition, and translation applications. This substantially revised fourth edition of a comprehensive, widely used machine learning textbook

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offers new coverage of recent advances in the field in both theory and practice, including developments in deep learning and neural networks. The book covers a broad array of topics not usually included in introductory machine learning texts, including supervised learning, Bayesian decision theory, parametric methods, semiparametric methods, nonparametric methods, multivariate analysis, hidden Markov models, reinforcement learning, kernel

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machines, graphical models, Bayesian estimation, and statistical testing. The fourth edition offers a new chapter on deep learning that discusses training, regularizing, and structuring deep neural networks such as convolutional and generative adversarial networks; new material in the chapter on reinforcement learning that covers the use of deep networks, the policy gradient methods, and deep reinforcement learning; new material in the chapter on multilayer

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perceptrons on autoencoders and the word2vec network; and discussion of a popular method of dimensionality reduction, t-SNE. New appendixes offer background material on linear algebra and optimization. End-of-chapter exercises help readers to apply concepts learned. Introduction to Machine Learning can be used in courses for advanced undergraduate and graduate students and as a reference for professionals.

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A concise overview of machine learning--computer programs that learn from data--the basis of such applications as voice recognition and driverless cars. Today, machine learning underlies a range of applications we use every day, from product recommendations to voice recognition--as well as some we don't yet use everyday, including driverless cars. It is the basis for a new approach to artificial intelligence that aims to program computers to use example data

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or past experience to solve a given problem. In this volume in the MIT Press Essential Knowledge series, Ethem Alpaydin offers a concise and accessible overview of "the new AI." This expanded edition offers new material on such challenges facing machine learning as privacy, security, accountability, and bias. Alpaydin, author of a popular textbook on machine learning, explains that as "Big Data" has gotten bigger, the theory of machine learning--the

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foundation of efforts to process that data into knowledge--has also advanced. He describes the evolution of the field, explains important learning algorithms, and presents example applications. He discusses the use of machine learning algorithms for pattern recognition; artificial neural networks inspired by the human brain; algorithms that learn associations between instances; and reinforcement learning, when an autonomous agent learns to take actions

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to maximize reward. In a new chapter, he considers transparency, explainability, and fairness, and the ethical and legal implications of making decisions based on data.

A survey of computational methods for understanding, generating, and manipulating human language, which offers a synthesis of classical representations and algorithms with contemporary machine learning techniques. This textbook provides a

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technical perspective on natural language processing—methods for building computer software that understands, generates, and manipulates human language. It emphasizes contemporary data-driven approaches, focusing on techniques from supervised and unsupervised machine learning. The first section establishes a foundation in machine learning by building a set of tools that will be used throughout the book and applying them

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to word-based textual analysis. The second section introduces structured representations of language, including sequences, trees, and graphs. The third section explores different approaches to the representation and analysis of linguistic meaning, ranging from formal logic to neural word embeddings. The final section offers chapter-length treatments of three transformative applications of natural language processing: information extraction,

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machine translation, and text generation. End-of-chapter exercises include both paper-and-pencil analysis and software implementation. The text synthesizes and distills a broad and diverse research literature, linking contemporary machine learning techniques with the field's linguistic and computational foundations. It is suitable for use in advanced undergraduate and graduate-level courses and as a reference for software engineers and

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data scientists. Readers should have a background in computer programming and college-level mathematics. After mastering the material presented, students will have the technical skill to build and analyze novel natural language processing systems and to understand the latest research in the field.

**Machine Learning for Hackers
Introduction to Deep Learning
From Logical Calculus to Artificial
Intelligence**

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A First Course in Machine Learning Grokking Machine Learning

Master the essential skills needed to recognize and solve complex problems with machine learning and deep learning. Using real-world examples that leverage the popular Python machine learning ecosystem, this book is your perfect companion for learning the art and science of machine learning to become a successful practitioner. The concepts, techniques, tools, frameworks, and methodologies used in this book will teach you how to think, design, build,

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and execute machine learning systems and projects successfully. Practical Machine Learning with Python follows a structured and comprehensive three-tiered approach packed with hands-on examples and code. Part 1 focuses on understanding machine learning concepts and tools. This includes machine learning basics with a broad overview of algorithms, techniques, concepts and applications, followed by a tour of the entire Python machine learning ecosystem. Brief guides for useful machine learning tools, libraries and frameworks are also covered. Part 2 details standard machine learning pipelines, with

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an emphasis on data processing analysis, feature engineering, and modeling. You will learn how to process, wrangle, summarize and visualize data in its various forms. Feature engineering and selection methodologies will be covered in detail with real-world datasets followed by model building, tuning, interpretation and deployment. Part 3 explores multiple real-world case studies spanning diverse domains and industries like retail, transportation, movies, music, marketing, computer vision and finance. For each case study, you will learn the application of various machine learning techniques and methods. The hands-on

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examples will help you become familiar with state-of-the-art machine learning tools and techniques and understand what algorithms are best suited for any problem. Practical Machine Learning with Python will empower you to start solving your own problems with machine learning today! What You'll Learn Execute end-to-end machine learning projects and systems Implement hands-on examples with industry standard, open source, robust machine learning tools and frameworks Review case studies depicting applications of machine learning and deep learning on diverse domains and industries Apply a wide range of

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machine learning models including regression, classification, and clustering. Understand and apply the latest models and methodologies from deep learning including CNNs, RNNs, LSTMs and transfer learning. Who This Book Is For IT professionals, analysts, developers, data scientists, engineers, graduate students

Introduction to Machine Learning MIT Press

A groundbreaking introduction to vectors, matrices, and least squares for engineering applications, offering a wealth of practical examples.

One of Mark Cuban's top reads for better

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understanding A.I. (inc.com, 2021) Your comprehensive entry-level guide to machine learning While machine learning expertise doesn't quite mean you can create your own Turing Test-proof android—as in the movie Ex Machina—it is a form of artificial intelligence and one of the most exciting technological means of identifying opportunities and solving problems fast and on a large scale. Anyone who masters the principles of machine learning is mastering a big part of our tech future and opening up incredible new directions in careers that include fraud detection, optimizing search results, serving real-time ads,

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credit-scoring, building accurate and sophisticated pricing models—and way, way more. Unlike most machine learning books, the fully updated 2nd Edition of Machine Learning For Dummies doesn't assume you have years of experience using programming languages such as Python (R source is also included in a downloadable form with comments and explanations), but lets you in on the ground floor, covering the entry-level materials that will get you up and running building models you need to perform practical tasks. It takes a look at the underlying—and fascinating—math principles that

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power machine learning but also shows that you don't need to be a math whiz to build fun new tools and apply them to your work and study. Understand the history of AI and machine learning Work with Python 3.8 and TensorFlow 2.x (and R as a download) Build and test your own models Use the latest datasets, rather than the worn out data found in other books Apply machine learning to real problems Whether you want to learn for college or to enhance your business or career performance, this friendly beginner's guide is your best introduction to machine learning, allowing you to become quickly

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confident using this amazing and fast-developing technology that's impacting lives for the better all over the world.

First-Order Methods in Optimization

Introduction to Applied Linear Algebra

Foundations of Data Science

The Deep Learning Revolution

Machine Learning in Industry

This edited collection describes recent progress on lazy learning, a branch of machine learning concerning algorithms that defer the processing of their inputs, reply to information requests by combining stored data, and typically discard

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constructed replies. It is the first edited volume in AI on this topic, whose many synonyms include `instance-based', `memory-based'. `exemplar-based', and `local learning', and whose topic intersects case-based reasoning and edited k-nearest neighbor classifiers. It is intended for AI researchers and students interested in pursuing recent progress in this branch of machine learning, but, due to the breadth of its contributions, it should also interest researchers and practitioners of data mining, case-based reasoning, statistics, and pattern recognition. Artificial intelligence (AI) has grown in presence in asset management and has revolutionized the sector

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in many ways. It has improved portfolio management, trading, and risk management practices by increasing efficiency, accuracy, and compliance. In particular, AI techniques help construct portfolios based on more accurate risk and return forecasts and more complex constraints. Trading algorithms use AI to devise novel trading signals and execute trades with lower transaction costs. AI also improves risk modeling and forecasting by generating insights from new data sources. Finally, robo-advisors owe a large part of their success to AI techniques. Yet the use of AI can also create new risks and challenges, such as those

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resulting from model opacity, complexity, and reliance on data integrity.

A comprehensive introduction to machine learning that uses probabilistic models and inference as a unifying approach. Today's Web-enabled deluge of electronic data calls for automated methods of data analysis. Machine learning provides these, developing methods that can automatically detect patterns in data and then use the uncovered patterns to predict future data. This textbook offers a comprehensive and self-contained introduction to the field of machine learning, based on a unified, probabilistic approach. The coverage combines

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breadth and depth, offering necessary background material on such topics as probability, optimization, and linear algebra as well as discussion of recent developments in the field, including conditional random fields, L1 regularization, and deep learning. The book is written in an informal, accessible style, complete with pseudo-code for the most important algorithms. All topics are copiously illustrated with color images and worked examples drawn from such application domains as biology, text processing, computer vision, and robotics. Rather than providing a cookbook of different heuristic methods, the book stresses a principled model-based approach, often

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using the language of graphical models to specify models in a concise and intuitive way. Almost all the models described have been implemented in a MATLAB software package—PMTK (probabilistic modeling toolkit)—that is freely available online. The book is suitable for upper-level undergraduates with an introductory-level college math background and beginning graduate students.

The goal of machine learning is to program computers to use example data or past experience to solve a given problem. Many successful applications of machine learning exist already, including systems that analyze past sales data to predict customer

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behavior, optimize robot behavior so that a task can be completed using minimum resources, and extract knowledge from bioinformatics data. Introduction to Machine Learning is a comprehensive textbook on the subject, covering a broad array of topics not usually included in introductory machine learning texts. Subjects include supervised learning; Bayesian decision theory; parametric, semi-parametric, and nonparametric methods; multivariate analysis; hidden Markov models; reinforcement learning; kernel machines; graphical models; Bayesian estimation; and statistical testing. Machine learning is rapidly becoming a skill

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that computer science students must master before graduation. The third edition of Introduction to Machine Learning reflects this shift, with added support for beginners, including selected solutions for exercises and additional example data sets (with code available online). Other substantial changes include discussions of outlier detection; ranking algorithms for perceptrons and support vector machines; matrix decomposition and spectral methods; distance estimation; new kernel algorithms; deep learning in multilayered perceptrons; and the nonparametric approach to Bayesian methods. All learning algorithms are

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explained so that students can easily move from the equations in the book to a computer program. The book can be used by both advanced undergraduates and graduate students. It will also be of interest to professionals who are concerned with the application of machine learning methods.

From Theory to Algorithms

Machine Learning from Weak Supervision

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A Problem-Solver's Guide to Building Real-World Intelligent Systems

Machine learning allows computers to learn and discern patterns without actually being programmed. When Statistical techniques and machine learning are combined together they are a powerful tool for analysing various kinds of data in many computer science/engineering areas including, image processing, speech processing, natural language processing, robot

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control, as well as in fundamental sciences such as biology, medicine, astronomy, physics, and materials. Introduction to Statistical Machine Learning provides a general introduction to machine learning that covers a wide range of topics concisely and will help you bridge the gap between theory and practice. Part I discusses the fundamental concepts of statistics and probability that are used in describing machine learning

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algorithms. Part II and Part III explain the two major approaches of machine learning techniques; generative methods and discriminative methods. While Part III provides an in-depth look at advanced topics that play essential roles in making machine learning algorithms more useful in practice. The accompanying MATLAB/Octave programs provide you with the necessary practical skills needed to accomplish a wide range of data

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analysis tasks. Provides the necessary background material to understand machine learning such as statistics, probability, linear algebra, and calculus. Complete coverage of the generative approach to statistical pattern recognition and the discriminative approach to statistical machine learning. Includes MATLAB/Octave programs so that readers can test the algorithms numerically and acquire both mathematical and practical

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skills in a wide range of data analysis tasks Discusses a wide range of applications in machine learning and statistics and provides examples drawn from image processing, speech processing, natural language processing, robot control, as well as biology, medicine, astronomy, physics, and materials.

This book provides an introduction to the mathematical and algorithmic foundations of data science, including

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machine learning, high-dimensional geometry, and analysis of large networks. Topics include the counterintuitive nature of data in high dimensions, important linear algebraic techniques such as singular value decomposition, the theory of random walks and Markov chains, the fundamentals of and important algorithms for machine learning, algorithms and analysis for clustering, probabilistic models for large

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networks, representation learning including topic modelling and non-negative matrix factorization, wavelets and compressed sensing. Important probabilistic techniques are developed including the law of large numbers, tail inequalities, analysis of random projections, generalization guarantees in machine learning, and moment methods for analysis of phase transitions in large random graphs. Additionally, important structural and complexity

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measures are discussed such as matrix norms and VC-dimension. This book is suitable for both undergraduate and graduate courses in the design and analysis of algorithms for data.

A concise and self-contained introduction to causal inference, increasingly important in data science and machine learning. The mathematization of causality is a relatively recent development, and has become increasingly important in data

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science and machine learning. This book offers a self-contained and concise introduction to causal models and how to learn them from data. After explaining the need for causal models and discussing some of the principles underlying causal inference, the book teaches readers how to use causal models: how to compute intervention distributions, how to infer causal models from observational and interventional data, and how causal

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ideas could be exploited for classical machine learning problems. All of these topics are discussed first in terms of two variables and then in the more general multivariate case. The bivariate case turns out to be a particularly hard problem for causal learning because there are no conditional independences as used by classical methods for solving multivariate cases. The authors consider analyzing statistical

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asymmetries between cause and effect to be highly instructive, and they report on their decade of intensive research into this problem. The book is accessible to readers with a background in machine learning or statistics, and can be used in graduate courses or as a reference for researchers. The text includes code snippets that can be copied and pasted, exercises, and an appendix with a summary of the most important technical concepts.

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This book seeks to comprehensively address the face recognition problem while gaining new insights from complementary fields of endeavor. These include neurosciences, statistics, signal and image processing, computer vision, machine learning and data mining. The book examines the evolution of research surrounding the field to date, explores new directions, and offers specific guidance on the most promising venues for future research

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and development. The book's focused approach and its clarity of presentation make this an excellent reference work.

*Foundations and Learning Algorithms
System Design, Implementation and
Evaluation*

*An Empirical Risk Minimization Approach
Gaussian Processes for Machine Learning
Semisupervised Learning for
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Unlock deeper insights into Machine Learning*

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whether you want to get started from scratch or want to extend your data science knowledge, this is an essential and unmissable resource. What You Will Learn Explore how to use different machine learning models to ask different questions of your data Learn how to build neural networks using Keras and Theano Find out how to write clean and elegant Python code that will optimize the strength of your algorithms Discover how to embed your machine learning model in a web application for increased accessibility Predict continuous target outcomes

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using regression analysis Uncover hidden patterns and structures in data with clustering Organize data using effective pre-processing techniques Get to grips with sentiment analysis to delve deeper into textual and social media data In Detail Machine learning and predictive analytics are transforming the way businesses and other organizations operate. Being able to understand trends and patterns in complex data is critical to success, becoming one of the key strategies for unlocking growth in a challenging contemporary marketplace. Python can help you

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deliver key insights into your data – its unique capabilities as a language let you build sophisticated algorithms and statistical models that can reveal new perspectives and answer key questions that are vital for success. Python Machine Learning gives you access to the world of predictive analytics and demonstrates why Python is one of the world's leading data science languages. If you want to ask better questions of data, or need to improve and extend the capabilities of your machine learning systems, this practical data science book is invaluable.

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Covering a wide range of powerful Python libraries, including scikit-learn, Theano, and Keras, and featuring guidance and tips on everything from sentiment analysis to neural networks, you'll soon be able to answer some of the most important questions facing you and your organization. Style and approach Python Machine Learning connects the fundamental theoretical principles behind machine learning to their practical application in a way that focuses you on asking and answering the right questions. It walks you through the key elements

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of Python and its powerful machine learning libraries, while demonstrating how to get to grips with a range of statistical models.

A detailed and up-to-date introduction to machine learning, presented through the unifying lens of probabilistic modeling and Bayesian decision theory. This book offers a detailed and up-to-date introduction to machine learning (including deep learning) through the unifying lens of probabilistic modeling and Bayesian decision theory. The book covers mathematical background (including linear

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algebra and optimization), basic supervised learning (including linear and logistic regression and deep neural networks), as well as more advanced topics (including transfer learning and unsupervised learning). End-of-chapter exercises allow students to apply what they have learned, and an appendix covers notation. Probabilistic Machine Learning grew out of the author's 2012 book, Machine Learning: A Probabilistic Perspective. More than just a simple update, this is a completely new book that reflects the dramatic developments in the

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field since 2012, most notably deep learning. In addition, the new book is accompanied by online Python code, using libraries such as scikit-learn, JAX, PyTorch, and Tensorflow, which can be used to reproduce nearly all the figures; this code can be run inside a web browser using cloud-based notebooks, and provides a practical complement to the theoretical topics discussed in the book. This introductory text will be followed by a sequel that covers more advanced topics, taking the same probabilistic approach. A substantially revised third edition of a

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comprehensive textbook that covers a broad range of topics not often included in introductory texts. The goal of machine learning is to program computers to use example data or past experience to solve a given problem. Many successful applications of machine learning exist already, including systems that analyze past sales data to predict customer behavior, optimize robot behavior so that a task can be completed using minimum resources, and extract knowledge from bioinformatics data. Introduction to Machine Learning is a

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Machine Learning reflects this shift, with added support for beginners, including selected solutions for exercises and additional example data sets (with code available online). Other substantial changes include discussions of outlier detection; ranking algorithms for perceptrons and support vector machines; matrix decomposition and spectral methods; distance estimation; new kernel algorithms; deep learning in multilayered perceptrons; and the nonparametric approach to Bayesian methods. All learning algorithms are explained so that

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students can easily move from the equations in the book to a computer program. The book can be used by both advanced undergraduates and graduate students. It will also be of interest to professionals who are concerned with the application of machine learning methods.

Publisher's Note: Products purchased from Third Party sellers are not guaranteed by the publisher for quality, authenticity, or access to any online entitlements included with the product. Cutting-edge machine learning principles, practices, and applications This comprehensive textbook

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explores the theoretical under-pinnings of learning and equips readers with the knowledge needed to apply powerful machine learning techniques to solve challenging real-world problems. Applied Machine Learning shows, step by step, how to conceptualize problems, accurately represent data, select and tune algorithms, interpret and analyze results, and make informed strategic decisions. Presented in a non-rigorous mathematical style, the book covers a broad array of machine learning topics with special emphasis on methods that have

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been profitably employed. Coverage includes:

•Supervised learning•Statistical learning•Learning with support vector machines (SVM)•Learning with neural networks (NN)•Fuzzy inference systems•Data clustering•Data transformations•Decision tree learning•Business intelligence•Data mining•And much more

Applied Machine Learning

Introduction to Statistical Machine Learning

Machine Learning

Understanding Machine Learning

Bayesian Reasoning and Machine Learning

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A comprehensive and self-contained introduction to Gaussian processes, which provide a principled, practical, probabilistic approach to learning in kernel machines. Gaussian processes (GPs) provide a principled, practical, probabilistic approach to learning in kernel machines. GPs have received increased attention in the machine-learning community over the past decade, and this book provides a long-needed systematic and unified treatment of theoretical and practical aspects of GPs in machine learning. The treatment is comprehensive and self-contained, targeted at researchers and students in machine learning and applied statistics. The book deals with the supervised-learning problem for both regression and classification, and includes detailed algorithms. A wide variety of covariance (kernel) functions are presented and their

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properties discussed. Model selection is discussed both from a Bayesian and a classical perspective. Many connections to other well-known techniques from machine learning and statistics are discussed, including support-vector machines, neural networks, splines, regularization networks, relevance vector machines and others. Theoretical issues including learning curves and the PAC-Bayesian framework are treated, and several approximation methods for learning with large datasets are discussed. The book contains illustrative examples and exercises, and code and datasets are available on the Web. Appendixes provide mathematical background and a discussion of Gaussian Markov processes.

This book covers different machine learning techniques such as artificial neural network, support vector machine, rough set

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theory and deep learning. It points out the difference between the techniques and their suitability for specific applications. This book also describes different applications of machine learning techniques for industrial problems. The book includes several case studies, helping researchers in academia and industries aspiring to use machine learning for solving practical industrial problems.

If you're an experienced programmer interested in crunching data, this book will get you started with machine learning—a toolkit of algorithms that enables computers to train themselves to automate useful tasks. Authors Drew Conway and John Myles White help you understand machine learning and statistics tools through a series of hands-on case studies, instead of a traditional math-heavy presentation. Each

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chapter focuses on a specific problem in machine learning, such as classification, prediction, optimization, and recommendation. Using the R programming language, you'll learn how to analyze sample datasets and write simple machine learning algorithms. Machine Learning for Hackers is ideal for programmers from any background, including business, government, and academic research. Develop a naïve Bayesian classifier to determine if an email is spam, based only on its text Use linear regression to predict the number of page views for the top 1,000 websites Learn optimization techniques by attempting to break a simple letter cipher Compare and contrast U.S. Senators statistically, based on their voting records Build a "whom to follow" recommendation system from Twitter data

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