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Fundamentals of Machine Learning for Predictive Data Analytics, second edition

Algorithms, Worked Examples, and Case Studies *MIT Press*

The second edition of a comprehensive introduction to machine learning approaches used in predictive data analytics, covering both theory and

practice. Machine learning is often used to build predictive models by extracting patterns from large datasets. These models are used in predictive data analytics applications including price prediction, risk assessment, predicting customer behavior, and document classification. This introductory textbook offers a detailed and focused treatment of the most important machine learning approaches used in predictive data analytics, covering both theoretical concepts and practical applications. Technical and mathematical material is augmented with explanatory worked examples, and case studies illustrate the application of these models in the broader business context. This second edition covers recent developments in machine learning, especially in a new chapter on deep learning, and two new chapters that go beyond predictive analytics to cover unsupervised learning and reinforcement learning. The book is accessible, offering nontechnical explanations of the ideas underpinning each approach before introducing mathematical models and algorithms. It is focused and deep, providing students with detailed knowledge on core concepts, giving them a solid basis for exploring the field on their own. Both early chapters and later case studies illustrate how the process of learning predictive models fits into the broader business context. The two case studies describe specific data analytics projects through each phase of development, from formulating the business problem to implementation of the analytics solution. The book can be used as a textbook at the introductory level or as a reference for professionals.

Fundamentals of Deep Learning

Designing Next-Generation Machine Intelligence Algorithms *"O'Reilly Media, Inc."*

With the reinvigoration of neural networks in the 2000s, deep learning has become an extremely active area of research, one that’s paving the way for modern machine learning. In this practical book, author Nikhil Buduma provides examples and clear explanations to guide you through major concepts of this complicated field. Companies such as Google, Microsoft, and Facebook are actively growing in-house deep-learning teams. For the rest of us, however, deep learning is still a pretty complex and difficult subject to grasp. If you’re familiar with Python, and have a background in calculus, along with a basic understanding of machine learning, this book will get you started. Examine the foundations of machine learning and neural networks Learn how to train feed-forward neural networks Use TensorFlow to implement your first neural network Manage problems that arise as you begin to make networks deeper Build neural networks that analyze complex images Perform effective dimensionality reduction using autoencoders Dive deep into sequence analysis to examine language Learn the fundamentals of reinforcement learning

Fundamentals of Machine Learning *Oxford University Press*

Interest in machine learning is exploding worldwide, both in research and for industrial applications. Machine learning is fast becoming a fundamental part of everyday life. This book is a brief introduction to this area - exploring its importance in a range of many disciplines, from science to engineering, and even its broader impact on our society. The book is written in a style that strikes a balance between brevity of explanation, rigorous mathematical argument, and outlines principle ideas. At the same time, it provides a comprehensive overview of a variety of methods and their application within this field. This includes an introduction to Bayesian approaches to modeling, as well as deep learning. Writing small programs to apply machine learning techniques is made easy by high level programming systems, and this book shows examples in Python with the machine learning libraries 'sklearn' and 'Keras'. The first four chapters concentrate on the practical side of applying machine learning techniques. The following four chapters discuss more fundamental concepts that includes their formulation in a probabilistic context. This is followed by two more chapters on advanced models, that of recurrent neural networks and that of reinforcement learning. The book closes with a brief discussion on the impact of machine learning and AI on our society. Fundamentals of Machine Learning provides a brief and accessible introduction to this rapidly growing field, one that will appeal to students and researchers across computer science and computational neuroscience, as well as the broader cognitive sciences.

Foundations of Machine Learning, second edition *MIT Press*

A new edition of a graduate-level machine learning textbook that focuses on the analysis and theory of algorithms. This book is a general introduction to machine learning that can serve as a textbook for graduate students and a reference for researchers. It covers fundamental modern topics in machine learning while providing the theoretical basis and conceptual tools needed for the discussion and justification of algorithms. It also describes several key aspects of the application of these algorithms. The authors aim to present novel theoretical tools and concepts while giving concise proofs even for relatively advanced topics. Foundations of Machine Learning is unique in its focus on the analysis and theory of algorithms. The first four chapters lay the theoretical foundation for what follows; subsequent chapters are mostly self-contained. Topics covered include the Probably Approximately Correct (PAC) learning framework; generalization bounds based on Rademacher complexity and VC-dimension; Support Vector Machines (SVMs); kernel methods; boosting; on-line learning; multi-class classification; ranking; regression; algorithmic stability; dimensionality reduction; learning automata and languages; and reinforcement learning. Each chapter ends with a set of exercises. Appendixes provide additional material including concise probability review. This second edition offers three new chapters, on model selection, maximum entropy models, and conditional entropy models. New material in the appendixes includes a major section on Fenchel duality, expanded coverage of concentration inequalities, and an entirely new entry on information theory. More than half of the exercises are new to this edition.

Machine Learning Fundamentals

Use Python and scikit-learn to get up and running with the hottest developments in machine learning *Packt Publishing Ltd*

With the flexibility and features of scikit-learn and Python, build machine learning algorithms that optimize the programming process and take application performance to a whole new level Key Features Explore scikit-learn uniform API and its application into any type of model Understand the difference between supervised and unsupervised models Learn the usage of machine learning through real-world examples Book Description As

machine learning algorithms become popular, new tools that optimize these algorithms are also developed. Machine Learning Fundamentals explains you how to use the syntax of scikit-learn. You'll study the difference between supervised and unsupervised models, as well as the importance of choosing the appropriate algorithm for each dataset. You'll apply unsupervised clustering algorithms over real-world datasets, to discover patterns and profiles, and explore the process to solve an unsupervised machine learning problem. The focus of the book then shifts to supervised learning algorithms. You'll learn to implement different supervised algorithms and develop neural network structures using the scikit-learn package. You'll also learn how to perform coherent result analysis to improve the performance of the algorithm by tuning hyperparameters. By the end of this book, you will have gain all the skills required to start programming machine learning algorithms. What you will learn Understand the importance of data representation Gain insights into the differences between supervised and unsupervised models Explore data using the Matplotlib library Study popular algorithms, such as k-means, Mean-Shift, and DBSCAN Measure model performance through different metrics Implement a confusion matrix using scikit-learn Study popular algorithms, such as Naïve-Bayes, Decision Tree, and SVM Perform error analysis to improve the performance of the model Learn to build a comprehensive machine learning program Who this book is for Machine Learning Fundamentals is designed for developers who are new to the field of machine learning and want to learn how to use the scikit-learn library to develop machine learning algorithms. You must have some knowledge and experience in Python programming, but you do not need any prior knowledge of scikit-learn or machine learning algorithms.

Machine Learning Fundamentals *Cambridge University Press*

A coherent introduction to core concepts and deep learning techniques that are critical to academic research and real-world applications.

Artificial Intelligence and Machine Learning Fundamentals

Develop real-world applications powered by the latest AI advances *Packt Publishing Ltd*

Create AI applications in Python and lay the foundations for your career in data science Key Features Practical examples that explain key machine learning algorithms Explore neural networks in detail with interesting examples Master core AI concepts with engaging activities Book Description Machine learning and neural networks are pillars on which you can build intelligent applications. Artificial Intelligence and Machine Learning Fundamentals begins by introducing you to Python and discussing AI search algorithms. You will cover in-depth mathematical topics, such as regression and classification, illustrated by Python examples. As you make your way through the book, you will progress to advanced AI techniques and concepts, and work on real-life datasets to form decision trees and clusters. You will be introduced to neural networks, a powerful tool based on Moore's law. By the end of this book, you will be confident when it comes to building your own AI applications with your newly acquired skills! What you will learn Understand the importance, principles, and fields of AI Implement basic artificial intelligence concepts with Python Apply regression and classification concepts to real-world problems Perform predictive analysis using decision trees and random forests Carry out clustering using the k-means and mean shift algorithms Understand the fundamentals of deep learning via practical examples Who this book is for Artificial Intelligence and Machine Learning Fundamentals is for software developers and data scientists who want to enrich their projects with machine learning. You do not need any prior experience in AI. However, it's recommended that you have knowledge of high school-level mathematics and at least one programming language (preferably Python).

Fundamentals of Deep Learning

Designing Next-Generation Machine Intelligence Algorithms *O'Reilly Media*

We're in the midst of an AI research explosion. Deep learning has unlocked superhuman perception that has powered our push toward self-driving vehicles, the ability to defeat human experts at a variety of difficult games including Go and Starcraft, and even generate essays with shockingly coherent prose. But deciphering these breakthroughs often takes a Ph.D. education in machine learning and mathematics. This updated second edition describes the intuition behind these innovations without the jargon and complexity. By the end of this book, Python-proficient programmers, software engineering professionals, and computer science majors will be able to re-implement these breakthroughs on their own and reason about them with a level of sophistication that rivals some of the best in the field. New chapters cover recent advancements in the fields of generative modeling and interpretability. Code examples throughout the book are updated to TensorFlow 2 and PyTorch 1.4.

Foundations of Machine Learning *MIT Press*

Fundamental topics in machine learning are presented along with theoretical and conceptual tools for the discussion and proof of algorithms.

Fundamentals of Machine Learning Using Python *Arcler Press*

Fundamentals of Machine Learning discusses the basics of python, use of python in computing and provides a general outlook on machine learning. This book provides an insight into concepts such as linear regression with one variable, linear algebra, and linear regression with multiple inputs. The classification with logistics regression model, regularization, neural networks, decision trees are explained in this book. The introduction to several concepts of machine learning such as component analysis, classification using k-Nearest Algorithm, k Means Clustering, computing with Tensor flow and natural language processing have been explained. This book explains the fundamental concepts of machine learning.

Fundamentals of Computational Neuroscience *Oxford University Press*

The new edition of Fundamentals of Computational Neuroscience build on the success and strengths of the first edition. Completely redesigned and revised, it introduces the theoretical foundations of neuroscience with a focus on the nature of information processing in the brain.

Fundamentals of Pattern Recognition and Machine Learning *Springer Nature*

Fundamentals of Pattern Recognition and Machine Learning is designed for a one or two-semester introductory course in Pattern Recognition or Machine Learning at the graduate or advanced undergraduate level. The book combines theory and practice and is suitable to the classroom and self-study. It has grown out of lecture notes and assignments that the author has developed while teaching classes on this topic for the past 13 years at Texas A&M University. The book is intended to be concise but thorough. It does not attempt an encyclopedic approach, but covers in significant detail the tools commonly used in pattern recognition and machine learning, including classification, dimensionality reduction, regression, and clustering, as well as recent popular topics such as Gaussian process regression and convolutional neural networks. In addition, the selection of topics has a few features that are unique among comparable texts: it contains an extensive chapter on classifier error estimation, as well as sections on Bayesian classification, Bayesian error estimation, separate sampling, and rank-based classification. The book is mathematically rigorous and covers the classical theorems in the area. Nevertheless, an effort is made in the book to strike a balance between theory and practice. In particular, examples with datasets from applications in bioinformatics and materials informatics are used throughout to illustrate the theory. These datasets are available from the book website to be used in end-of-chapter coding assignments based on python and scikit-learn. All plots in the text were generated using python scripts, which are also available on the book website.

Mathematics for Machine Learning *Cambridge University Press*

The fundamental mathematical tools needed to understand machine learning include linear algebra, analytic geometry, matrix decompositions, vector calculus, optimization, probability and statistics. These topics are traditionally taught in disparate courses, making it hard for data science or computer science students, or professionals, to efficiently learn the mathematics. This self-contained textbook bridges the gap between mathematical and machine learning texts, introducing the mathematical concepts with a minimum of prerequisites. It uses these concepts to derive four central machine learning methods: linear regression, principal component analysis, Gaussian mixture models and support vector machines. For students and others with a mathematical background, these derivations provide a starting point to machine learning texts. For those learning the mathematics for the first time, the methods help build intuition and practical experience with applying mathematical concepts. Every chapter includes worked examples and exercises to test understanding. Programming tutorials are offered on the book's web site.

Probability for Statistics and Machine Learning

Fundamentals and Advanced Topics *Springer Science & Business Media*

This book provides a versatile and lucid treatment of classic as well as modern probability theory, while integrating them with core topics in statistical theory and also some key tools in machine learning. It is written in an extremely accessible style, with elaborate motivating discussions and numerous worked out examples and exercises. The book has 20 chapters on a wide range of topics, 423 worked out examples, and 808 exercises. It is unique in its unification of probability and statistics, its coverage and its superb exercise sets, detailed bibliography, and in its substantive treatment of many topics of current importance. This book can be used as a text for a year long graduate course in statistics, computer science, or mathematics, for self-study, and as an invaluable research reference on probability and its applications. Particularly worth mentioning are the treatments of distribution theory, asymptotics, simulation and Markov Chain Monte Carlo, Markov chains and martingales, Gaussian processes, VC theory, probability metrics, large deviations, bootstrap, the EM algorithm, confidence intervals, maximum likelihood and Bayes estimates, exponential families, kernels, and Hilbert spaces, and a self contained complete review of univariate probability.

Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow

Concepts, Tools, and Techniques to Build Intelligent Systems *"O'Reilly Media, Inc."*

Through a series of recent breakthroughs, deep learning has boosted the entire field of machine learning. Now, even programmers who know close to nothing about this technology can use simple, efficient tools to implement programs capable of learning from data. This practical book shows you how. By using concrete examples, minimal theory, and two production-ready Python frameworks—Scikit-Learn and TensorFlow—author Aurélien Géron helps you gain an intuitive understanding of the concepts and tools for building intelligent systems. You'll learn a range of techniques, starting with simple linear regression and progressing to deep neural networks. With exercises in each chapter to help you apply what you've learned, all you need is programming experience to get started. Explore the machine learning landscape, particularly neural nets Use Scikit-Learn to track an example machine-learning project end-to-end Explore several training models, including support vector machines, decision trees, random forests, and ensemble methods Use the TensorFlow library to build and train neural nets Dive into neural net architectures, including convolutional nets, recurrent nets, and deep reinforcement learning Learn techniques for training and scaling deep neural nets

Fundamentals of Machine Learning

Support Vector Machines Made Easy

Statistics with Julia

Fundamentals for Data Science, Machine Learning and Artificial Intelligence *Springer Nature*

This monograph uses the Julia language to guide the reader through an exploration of the fundamental concepts of probability and statistics, all with

a view of mastering machine learning, data science, and artificial intelligence. The text does not require any prior statistical knowledge and only assumes a basic understanding of programming and mathematical notation. It is accessible to practitioners and researchers in data science, machine learning, bio-statistics, finance, or engineering who may wish to solidify their knowledge of probability and statistics. The book progresses through ten independent chapters starting with an introduction of Julia, and moving through basic probability, distributions, statistical inference, regression analysis, machine learning methods, and the use of Monte Carlo simulation for dynamic stochastic models. Ultimately this text introduces the Julia programming language as a computational tool, uniquely addressing end-users rather than developers. It makes heavy use of over 200 code examples to illustrate dozens of key statistical concepts. The Julia code, written in a simple format with parameters that can be easily modified, is also available for download from the book’s associated GitHub repository online. See what co-creators of the Julia language are saying about the book: Professor Alan Edelman, MIT: With “Statistics with Julia”, Yoni and Hayden have written an easy to read, well organized, modern introduction to statistics. The code may be looked at, and understood on the static pages of a book, or even better, when running live on a computer. Everything you need is here in one nicely written self-contained reference. Dr. Viral Shah, CEO of Julia Computing: Yoni and Hayden provide a modern way to learn statistics with the Julia programming language. This book has been perfected through iteration over several semesters in the classroom. It prepares the reader with two complementary skills - statistical reasoning with hands on experience and working with large datasets through training in Julia.

Understanding Machine Learning

From Theory to Algorithms *Cambridge University Press*
Introduces machine learning and its algorithmic paradigms, explaining the principles behind automated learning approaches and the considerations underlying their usage.

Machine Learning

The Basics *Springer*
Machine learning (ML) has become a commonplace element in our everyday lives and a standard tool for many fields of science and engineering. To make optimal use of ML, it is essential to understand its underlying principles. This book approaches ML as the computational implementation of the scientific principle. This principle consists of continuously adapting a model of a given data-generating phenomenon by minimizing some form of loss incurred by its predictions. The book trains readers to break down various ML applications and methods in terms of data, model, and loss, thus helping them to choose from the vast range of ready-made ML methods. The book’s three-component approach to ML provides uniform coverage of a wide range of concepts and techniques. As a case in point, techniques for regularization, privacy-preservation as well as explainability amount to specific design choices for the model, data, and loss of a ML method.

Mastering Deep Learning Fundamentals

An Ultimate Guide for Beginners in Data Science *AI Publishing*
** ONE HOUR FREE VIDEO COURSE IN DEEP LEARNING INCLUDED**
Get your copy now, the price will change soon
You are interested in deep learning, but don't know how to get started
Let us help you
Who are the book for? Are a college student and want more than your university course offers
Are you a student interested in a career in Data science? Are you a programmer who wants to make a career switch into data science and AI? Are you an engineer who wants to use new data science techniques at your current job? Are you an entrepreneur who dreams of a data science but do not yet know the basics? Are you a hobbyist who wants to build cool data science projects? Are you a data scientist practitioner and want to broaden your area of expertise? If the answer to any of the above questions is a YES, this book is for you.
We have designed this book for beginners in mind and our goal is to prepare students with practical skills to solve real-world problems and to stand out in the job market.
This book are not for shallow learners who simply want to copy-paste code. This book will require your time and commitment.
Our book is different from other books?
If you are searching for a step by step guide to learn deep learning and AI from scratch or are interested in the current updates of the AI world, our book is just the right one for you. This book paves beginners' road towards the path of deep learning concepts and algorithms without any traditional complexity of mathematical formulas.
With the help of graphs and images, this books is the easiest to comprehend even by those who have no previous technological knowledge of machine learning. Moreover, our book, with its comprehensive content, prepares the readers for higher advanced courses.
We strive to provide world-class data science and AI education at reasonable prices. To achieve that, we have put in a lot of planning and efforts to provide a rich learning experience for the students.
What's Inside This Book?
Part I: Fundamentals of Deep learning
Fundamentals of Probability
Fundamentals of Statistics
Fundamentals of Linear Algebra
Introduction to Machine Learning and Deep Learning
Fundamentals of Machine Learning
Fundamentals of Neural Networks and Deep Learning
Deep Learning Parameters and Hyper-parameters
Deep Neural Networks
Layers
Deep Learning Activation Functions
Deep Learning Loss Functions
Deep Learning Optimization Algorithms
Convolutional Neural Network
Recurrent Neural Networks
LSTM
Recursive Neural Networks
Bonus Course
Conclusion
Part II: Deep Learning in Practice (In Jupyter notebooks)
Python for Beginners
Python Data Structures
Python Function
Object Oriented Programming in Python
Best practices in Python and Zen of Python
Installing Python
Numpy, Pandas, Matplotlib and Scikit-learn
Evaluating a model's performance
Keras and Tensorflow
Deep learning workstation: Jupyter Notebooks and Getting Binary Classification Building Deep Learning Model
Convolutional Neural Networks in Keras
Data Preparation
Model Building
Training and Testing
Deep learning for text and sequences
Brief introduction to Google Colab
Data Preparation
Data Wrangling and Analysis
Recurrent Neural Network (RNN)
** MONEY BACK GUARANTEE BY AMAZON **
If you aren't satisfied, for more information about the amazon refund service please go to the amazon help platform or contact us (our email inside the book).

Deep Learning Essentials

Your hands-on guide to the fundamentals of deep learning and neural network modeling *Packt Publishing Ltd*
Get to grips with the essentials of deep learning by leveraging the power of Python
Key Features
Your one-stop solution to get started with the essentials of deep learning and neural network modeling
Train different kinds of neural networks to tackle various problems in Natural Language Processing, computer vision, speech recognition, and more
Covers popular Python libraries such as Tensorflow, Keras, and more, along with tips on training, deploying and optimizing your deep learning models in the best possible manner
Book Description
Deep Learning a trending topic in the field of Artificial Intelligence today and can be considered to be an advanced form of machine learning, which is quite tricky to master. This book will help you take your first steps in training efficient deep learning models and applying them in various practical scenarios. You will model, train, and deploy different kinds of neural networks such as Convolutional Neural Network, Recurrent Neural Network, and will see some of their applications in real-world domains including computer vision, natural language processing, speech recognition, and so on. You will build practical projects such as chatbots, implement reinforcement learning to build smart games, and develop expert systems for image captioning and processing. Popular Python library such as TensorFlow is used in this book to build the models. This book also covers solutions for different problems you might come across while training models, such as noisy datasets, small datasets, and more. This book does not assume any prior knowledge of deep learning. By the end of this book, you will have a firm understanding of the basics of deep learning and neural network modeling, along with their practical applications. What you will learn
Get to grips with the core concepts of deep learning and neural networks
Set up deep learning library such as TensorFlow
Fine-tune your deep learning models for NLP and Computer Vision applications
Unify different information sources, such as images, text, and speech through deep learning
Optimize and fine-tune your deep learning models for better performance
Train a deep reinforcement learning model that plays a game better than humans
Learn how to make your models get the best out of your GPU or CPU
Who this book is for
Aspiring data scientists and machine learning experts who have limited or no exposure to deep learning will find this book to be very useful. If you are looking for a resource that gets you up and running with the fundamentals of deep learning and neural networks, this book is for you. As the models in the book are trained using the popular Python-based libraries such as Tensorflow and Keras, it would be useful to have sound programming knowledge of Python.

Machine Learning in Healthcare

Fundamentals and Recent Applications
"Machine Learning in Healthcare discusses how to build various ML algorithms and how they can be applied to improve healthcare systems. It covers fundamental concepts including mathematical requisites and traditional machine-learning framework followed by advanced machine-learning methods and their applications in medical fields"--

Deep Learning: Fundamentals, Theory and Applications Springer

The purpose of this edited volume is to provide a comprehensive overview on the fundamentals of deep learning, introduce the widely-used learning architectures and algorithms, present its latest theoretical progress, discuss the most popular deep learning platforms and data sets, and describe how many deep learning methodologies have brought great breakthroughs in various applications of text, image, video, speech and audio processing. Deep learning (DL) has been widely considered as the next generation of machine learning methodology. DL attracts much attention and also achieves great success in pattern recognition, computer vision, data mining, and knowledge discovery due to its great capability in learning high-level abstract features from vast amount of data. This new book will not only attempt to provide a general roadmap or guidance to the current deep learning methodologies, but also present the challenges and envision new perspectives which may lead to further breakthroughs in this field. This book will serve as a useful reference for senior (undergraduate or graduate) students in computer science, statistics, electrical engineering, as well as others interested in studying or exploring the potential of exploiting deep learning algorithms. It will also be of special interest to researchers in the area of AI, pattern recognition, machine learning and related areas, alongside engineers interested in applying deep learning models in existing or new practical applications.

Machine Learning for Decision Makers

Cognitive Computing Fundamentals for Better Decision Making *Apress*
Take a deep dive into the concepts of machine learning as they apply to contemporary business and management. You will learn how machine learning techniques are used to solve fundamental and complex problems in society and industry. Machine Learning for Decision Makers serves as an excellent resource for establishing the relationship of machine learning with IoT, big data, and cognitive and cloud computing to give you an overview of how these modern areas of computing relate to each other. This book introduces a collection of the most important concepts of machine learning and sets them in context with other vital technologies that decision makers need to know about. These concepts span the process from envisioning the problem to applying machine-learning techniques to your particular situation. This discussion also provides an insight to help deploy the results to improve decision-making. The book uses case studies and jargon busting to help you grasp the theory of machine learning quickly. You'll soon gain the big picture of machine learning and how it fits with other cutting-edge IT services. This knowledge will give you confidence in your decisions for the future of your business. What You Will Learn
Discover the machine learning, big data, and cloud and cognitive computing technology stack
Gain insights into machine learning concepts and practices
Understand business and enterprise decision-making using machine learning
Absorb machine-learning best practices
Who This Book Is For
Managers tasked with making key decisions who want to learn how and when machine learning and related technologies can help them.

Machine Learning and Data Science

Fundamentals and Applications *Wiley-Scrivener*

Machine learning (ML) and data science (DS) are very active topics with an extensive scope, both in terms of theory and applications. They have been established as an important emergent scientific field and paradigm driving research evolution in such disciplines as statistics, computing science and intelligence science, and practical transformation in such domains as science, engineering, the public sector, business, social science, and lifestyle. Simultaneously, their applications provide important challenges that can often be addressed only with innovative machine learning and data science algorithms. These algorithms encompass the larger areas of artificial intelligence, data analytics, machine learning, pattern recognition, natural language understanding, and big data manipulation. They also tackle related new scientific challenges, ranging from data capture, creation, storage, retrieval, sharing, analysis, optimization, and visualization, to integrative analysis across heterogeneous and interdependent complex resources for better decision-making, collaboration, and, ultimately, value creation. The outstanding new volume focuses on the latest developments in machine learning and data science, as well as on the synergy between data science and machine learning. This book explores new developments in statistics, mathematics and computing that are relevant for data science from a machine learning perspective, including foundations, systems, innovative applications and other research contributions related to the overall design of machine learning and models and algorithms that are relevant for data science. The book encompasses all aspects of research and development in ML and DS, including but not limited to data discovery, computer vision, natural language processing (NLP), intelligent systems, neural networks, AI-based software engineering, bioinformatics and their applications in the areas of engineering, business and social sciences. It covers a broad spectrum of applications in the community, from industry, government, and academia. Whether for the veteran engineer or scientist, the student, or a manager or other technician working in the field, this volume is a must-have for any library.

Machine Learning for Healthcare

Handling and Managing Data *CRC Press*

Machine Learning for Healthcare: Handling and Managing Data provides in-depth information about handling and managing healthcare data through machine learning methods. This book expresses the long-standing challenges in healthcare informatics and provides rational explanations of how to deal with them. Machine Learning for Healthcare: Handling and Managing Data provides techniques on how to apply machine learning within your organization and evaluate the efficacy, suitability, and efficiency of machine learning applications. These are illustrated in a case study which examines how chronic disease is being redefined through patient-led data learning and the Internet of Things. This text offers a guided tour of machine learning algorithms, architecture design, and applications of learning in healthcare. Readers will discover the ethical implications of machine learning in healthcare and the future of machine learning in population and patient health optimization. This book can also help assist in the creation of a machine learning model, performance evaluation, and the operationalization of its outcomes within organizations. It may appeal to computer science/information technology professionals and researchers working in the area of machine learning, and is especially applicable to the healthcare sector. The features of this book include: A unique and complete focus on applications of machine learning in the healthcare sector. An examination of how data analysis can be done using healthcare data and bioinformatics. An investigation of how healthcare companies can leverage the tapestry of big data to discover new business values. An exploration of the concepts of machine learning, along with recent research developments in healthcare sectors.

Fundamentals of Machine Learning *Oxford University Press, USA*

Interest in machine learning is exploding worldwide, both in research and for industrial applications. Machine learning is fast becoming a fundamental part of everyday life. This book is a brief introduction to this area - exploring its importance in a range of many disciplines, from science to engineering, and even its broader impact on our society. The book is written in a style that strikes a balance between brevity of explanation, rigorous mathematical argument, and outlines principle ideas. At the same time, it provides a comprehensive overview of a variety of methods and their application within this field. This includes an introduction to Bayesian approaches to modeling, as well as deep learning. Writing small programs to apply machine learning techniques is made easy by high level programming systems, and this book shows examples in Python with the machine learning libraries 'sklearn' and 'Keras'. The first four chapters concentrate on the practical side of applying machine learning techniques. The following four chapters discuss more fundamental concepts that includes their formulation in a probabilistic context. This is followed by two more chapters on advanced models, that of recurrent neural networks and that of reinforcement learning. The book closes with a brief discussion on the impact of machine learning and AI on our society. Fundamentals of Machine Learning provides a brief and accessible introduction to this rapidly growing field, one that will appeal to students and researchers across computer science and computational neuroscience, as well as the broader cognitive sciences.

Fundamentals of Machine Learning for Predictive Data Analytics

Algorithms, Worked Examples, and Case Studies

The second edition of a comprehensive introduction to machine learning approaches used in predictive data analytics, covering both theory and practice. Machine learning is often used to build predictive models by extracting patterns from large datasets. These models are used in predictive data analytics applications including price prediction, risk assessment, predicting customer behavior, and document classification. This introductory textbook offers a detailed and focused treatment of the most important machine learning approaches used in predictive data analytics, covering both theoretical concepts and practical applications. Technical and mathematical material is augmented with explanatory worked examples, and case

studies illustrate the application of these models in the broader business context. This second edition covers recent developments in machine learning, especially in a new chapter on deep learning, and two new chapters that go beyond predictive analytics to cover unsupervised learning and reinforcement learning.

R Machine Learning by Example

Understand the fundamentals of machine learning with R and build your own dynamic algorithms to tackle complicated real-world problems successfullyAbout This Book- Get to grips with the concepts of machine learning through exciting real-world examples- Visualize and solve complex problems by using power-packed R constructs and its robust packages for machine learning- Learn to build your own machine learning system with this example-based practical guideWho This Book Is ForIf you are interested in mining useful information from data using state-of-the-art techniques to make data-driven decisions, this is a go-to guide for you. No prior experience with data science is required, although basic knowledge of R is highly desirable. Prior knowledge in machine learning would be helpful but is not necessary.What You Will Learn- Utilize the power of R to handle data extraction, manipulation, and exploration techniques- Use R to visualize data spread across multiple dimensions and extract useful features- Explore the underlying mathematical and logical concepts that drive machine learning algorithms- Dive deep into the world of analytics to predict situations correctly- Implement R machine learning algorithms from scratch and be amazed to see the algorithms in action- Write reusable code and build complete machine learning systems from the ground up- Solve interesting real-world problems using machine learning and R as the journey unfolds- Harness the power of robust and optimized R packages to work on projects that solve real-world problems in machine learning and data scienceIn DetailData science and machine learning are some of the top buzzwords in the technical world today. From retail stores to Fortune 500 companies, everyone is working hard to making machine learning give them data-driven insights to grow their business. With powerful data manipulation features, machine learning packages, and an active developer community, R empowers users to build sophisticated machine learning systems to solve real-world data problems.This book takes you on a data-driven journey that starts with the very basics of R and machine learning and gradually builds upon the concepts to work on projects that tackle real-world problems.You'll begin by getting an understanding of the core concepts and definitions required to appreciate machine learning algorithms and concepts. Building upon the basics, you will then work on three different projects to apply the concepts of machine learning, following current trends and cover major algorithms as well as popular R packages in detail. These projects have been neatly divided into six different chapters covering the worlds of e-commerce, finance, and social-media, which are at the very core of this data-driven revolution. Each of the projects will help you to understand, explore, visualize, and derive insights depending upon the domain and algorithms.Through this book, you will learn to apply the concepts of machine learning to deal with data-related problems and solve them using the powerful yet simple language, R.Style and approachThe book is an enticing journey that starts from the very basics to gradually pick up pace as the story unfolds. Each concept is first defined in the larger context of things succinctly, followed by a detailed explanation of their application. Each topic is explained with the help of a project that solves a real real-world problem involving hands-on work thus giving you a deep insight into the world of machine learning.

The Principles of Deep Learning Theory

An Effective Theory Approach to Understanding Neural Networks *Cambridge University Press*

This textbook establishes a theoretical framework for understanding deep learning models of practical relevance. With an approach that borrows from theoretical physics, Roberts and Yaida provide clear and pedagogical explanations of how realistic deep neural networks actually work. To make results from the theoretical forefront accessible, the authors eschew the subject's traditional emphasis on intimidating formality without sacrificing accuracy. Straightforward and approachable, this volume balances detailed first-principle derivations of novel results with insight and intuition for theorists and practitioners alike. This self-contained textbook is ideal for students and researchers interested in artificial intelligence with minimal prerequisites of linear algebra, calculus, and informal probability theory, and it can easily fill a semester-long course on deep learning theory. For the first time, the exciting practical advances in modern artificial intelligence capabilities can be matched with a set of effective principles, providing a timeless blueprint for theoretical research in deep learning.

The Fundamentals of Data Science: Big Data, Deep Learning, and Machine Learning: What You Need to Know about Data Science and why it Matters *Vinco Publishing*

Data science is no easy term to define. While there are many definitions available that point out its statistical or logical aspects, others focus on its machine learning impacts. Today only, get this Amazon book for just \$19.99 for a limited time. Regularly priced at \$35.99. The truth is, data science is a process that requires an understanding of multiple fields, methods, techniques, and more. Data science cannot be easily labeled because, when applied, it looks different to each person, business, or organization utilizing it. While the term may not be easy to define, what it is used for, can be used for, and approaches to it can be more easily understood. And that is precisely what this book aims to do. Scroll Up & Click to Buy Now! Here Is A Preview Of What You'll Discover...In this step-by-step book: This book will not only thoroughly go over all the skills, people, and steps involved in data science, it will also look closely at: ● What big data is and how data science came from it. ● How data has evolved, resulting in new methods for understanding it. ● How data science influenced artificial intelligence. ● How data science is used in machine learning and deep learning. ● How data science revolutionizes the way we train machines and set up neural networks. Data science, big data, machine learning, and deep learning tend to intimidate people. Many believe it is too complicated or technology-centered for them to break into these fields. This book is designed to simplify these complex areas in a way that anyone can understand the fundamentals. Whether you are just hearing about data science, are a student studying it in college, or looking to expand your career, this book has something to offer every type of data enthusiast. Order your copy today! Take action right away by purchase this book "The Fundamentals of Data Science: Big Data, Deep Learning, and Machine Learning: What you need to know

about data science and why it matters.", for a limited time discount of only \$19.99! Hurry Up!! Tags: ● data science quick ● data science strategy ● data science trading ● data science journal ● insight data science ● data science salary ● data science jobs ● data science espanol ● data science case study ● data science beginner guide

Prognostics and Health Management of Electronics

Fundamentals, Machine Learning, and the Internet of Things *John Wiley & Sons*
An indispensable guide for engineers and data scientists in design, testing, operation, manufacturing, and maintenance A road map to the current challenges and available opportunities for the research and development of Prognostics and Health Management (PHM), this important work covers all areas of electronics and explains how to: assess methods for damage estimation of components and systems due to field loading conditions assess the cost and benefits of prognostic implementations develop novel methods for in situ monitoring of products and systems in actual life-cycle conditions enable condition-based (predictive) maintenance increase system availability through an extension of maintenance cycles and/or timely repair actions; obtain knowledge of load history for future design, qualification, and root cause analysis reduce the occurrence of no fault found (NFF) subtract life-cycle costs of equipment from reduction in inspection costs, downtime, and inventory Prognostics and Health Management of Electronics also explains how to understand statistical techniques and machine learning methods used for diagnostics and prognostics. Using this valuable resource, electrical engineers, data scientists, and design engineers will be able to fully grasp the synergy between IoT, machine learning, and risk assessment.

Deep Learning

A Practitioner's Approach *"O'Reilly Media, Inc."*
Although interest in machine learning has reached a high point, lofty expectations often scuttle projects before they get very far. How can machine learning—especially deep neural networks—make a real difference in your organization? This hands-on guide not only provides the most practical information available on the subject, but also helps you get started building efficient deep learning networks. Authors Adam Gibson and Josh Patterson provide theory on deep learning before introducing their open-source Deeplearning4j (DL4J) library for developing production-class workflows. Through real-world examples, you'll learn methods and strategies for training deep network architectures and running deep learning workflows on Spark and Hadoop with DL4J. Dive into machine learning concepts in general, as well as deep learning in particular Understand how deep networks evolved from neural network fundamentals Explore the major deep network architectures, including Convolutional and Recurrent Learn how to map specific deep networks to the right problem Walk through the fundamentals of tuning general neural networks and specific deep network architectures Use vectorization techniques for different data types with DataVec, DL4J's workflow tool Learn how to use DL4J natively on Spark and Hadoop

Hands-On Machine Learning with R *CRC Press*
Hands-on Machine Learning with R provides a practical and applied approach to learning and developing intuition into today's most popular machine learning methods. This book serves as a practitioner's guide to the machine learning process and is meant to help the reader learn to apply the machine learning stack within R, which includes using various R packages such as glmnet, h2o, ranger, xgboost, keras, and others to effectively model and gain insight from their data. The book favors a hands-on approach, providing an intuitive understanding of machine learning concepts through concrete examples and just a little bit of theory. Throughout this book, the reader will be exposed to the entire machine learning process including feature engineering, resampling, hyperparameter tuning, model evaluation, and interpretation. The reader will be exposed to powerful algorithms such as regularized regression, random forests, gradient boosting machines, deep learning, generalized low rank models, and more! By favoring a hands-on approach and using real word data, the reader will gain an intuitive understanding of the architectures and engines that drive these algorithms and packages, understand when and how to tune the various hyperparameters, and be able to interpret model results. By the end of this book, the reader should have a firm grasp of R's machine learning stack and be able to implement a systematic approach for producing high quality modeling results. Features: · Offers a practical and applied introduction to the most popular machine learning methods. · Topics covered include feature engineering, resampling, deep learning and more. · Uses a hands-on approach and real world data.

Hands-on Scikit-Learn for Machine Learning Applications

Data Science Fundamentals with Python *Apress*
Aspiring data science professionals can learn the Scikit-Learn library along with the fundamentals of machine learning with this book. The book combines the Anaconda Python distribution with the popular Scikit-Learn library to demonstrate a wide range of supervised and unsupervised machine learning algorithms. Care is taken to walk you through the principles of machine learning through clear examples written in Python that you can try out and experiment with at home on your own machine. All applied math and programming skills required to master the content are covered in this book. In-depth knowledge of object-oriented programming is not required as working and complete examples are provided and explained. Coding examples are in-depth and complex when necessary. They are also concise, accurate, and complete, and complement the machine learning concepts introduced. Working the examples helps to build the skills necessary to understand and apply complex machine learning algorithms. Hands-on Scikit-Learn for Machine Learning Applications is an excellent starting point for those pursuing a career in machine learning. Students of this book will learn the fundamentals that are a prerequisite to competency. Readers will be exposed to the Anaconda distribution of Python that is designed

specifically for data science professionals, and will build skills in the popular Scikit-Learn library that underlies many machine learning applications in the world of Python. What You'll Learn Work with simple and complex datasets common to Scikit-Learn Manipulate data into vectors and matrices for algorithmic processing Become familiar with the Anaconda distribution used in data science Apply machine learning with Classifiers, Regressors, and Dimensionality Reduction Tune algorithms and find the best algorithms for each dataset Load data from and save to CSV, JSON, Numpy, and Pandas formats Who This Book Is For The aspiring data scientist yearning to break into machine learning through mastering the underlying fundamentals that are sometimes skipped over in the rush to be productive. Some knowledge of object-oriented programming and very basic applied linear algebra will make learning easier, although anyone can benefit from this book.

Deep Reinforcement Learning

Fundamentals, Research and Applications *Springer Nature*
Deep reinforcement learning (DRL) is the combination of reinforcement learning (RL) and deep learning. It has been able to solve a wide range of complex decision-making tasks that were previously out of reach for a machine, and famously contributed to the success of AlphaGo. Furthermore, it opens up numerous new applications in domains such as healthcare, robotics, smart grids and finance. Divided into three main parts, this book provides a comprehensive and self-contained introduction to DRL. The first part introduces the foundations of deep learning, reinforcement learning (RL) and widely used deep RL methods and discusses their implementation. The second part covers selected DRL research topics, which are useful for those wanting to specialize in DRL research. To help readers gain a deep understanding of DRL and quickly apply the techniques in practice, the third part presents mass applications, such as the intelligent transportation system and learning to run, with detailed explanations. The book is intended for computer science students, both undergraduate and postgraduate, who would like to learn DRL from scratch, practice its implementation, and explore the research topics. It also appeals to engineers and practitioners who do not have strong machine learning background, but want to quickly understand how DRL works and use the techniques in their applications.

Fundamentals and Methods of Machine and Deep Learning

Algorithms, Tools, and Applications *Wiley-Scrivener*
FUNDAMENTALS AND METHODS OF MACHINE AND DEEP LEARNING The book provides a practical approach by explaining the concepts of machine learning and deep learning algorithms, evaluation of methodology advances, and algorithm demonstrations with applications. Over the past two decades, the field of machine learning and its subfield deep learning have played a main role in software applications development. Also, in recent research studies, they are regarded as one of the disruptive technologies that will transform our future life, business, and the global economy. The recent explosion of digital data in a wide variety of domains, including science, engineering, Internet of Things, biomedical, healthcare, and many business sectors, has declared the era of big data, which cannot be analysed by classical statistics but by the more modern, robust machine learning and deep learning techniques. Since machine learning learns from data rather than by programming hard-coded decision rules, an attempt is being made to use machine learning to make computers that are able to solve problems like human experts in the field. The goal of this book is to present a??practical approach by explaining the concepts of machine learning and deep learning algorithms with applications. Supervised machine learning algorithms, ensemble machine learning algorithms, feature selection, deep learning techniques, and their applications are discussed. Also included in the eighteen chapters is unique information which provides a clear understanding of concepts by using algorithms and case studies illustrated with applications of machine learning and deep learning in different domains, including disease prediction, software defect prediction, online television analysis, medical image processing, etc. Each of the chapters briefly described below provides both a chosen approach and its implementation. Audience Researchers and engineers in artificial intelligence, computer scientists as well as software developers.

TinyML

Machine Learning with TensorFlow Lite on Arduino and Ultra-Low-Power Microcontrollers *O'Reilly Media*
Deep learning networks are getting smaller. Much smaller. The Google Assistant team can detect words with a model just 14 kilobytes in size—small enough to run on a microcontroller. With this practical book you'll enter the field of TinyML, where deep learning and embedded systems combine to make astounding things possible with tiny devices. Pete Warden and Daniel Situnayake explain how you can train models small enough to fit into any environment. Ideal for software and hardware developers who want to build embedded systems using machine learning, this guide walks you through creating a series of TinyML projects, step-by-step. No machine learning or microcontroller experience is necessary. Build a speech recognizer, a camera that detects people, and a magic wand that responds to gestures Work with Arduino and ultra-low-power microcontrollers Learn the essentials of ML and how to train your own models Train models to understand audio, image, and accelerometer data Explore TensorFlow Lite for Microcontrollers, Google's toolkit for TinyML Debug applications and provide safeguards for privacy and security Optimize latency, energy usage, and model and binary size

Fundamentals of Machine Learning with Scikit-learn

"In this course you will learn all the important Machine Learning algorithms that are commonly used in the field of data science. These algorithms can be used for supervised as well as unsupervised learning, reinforcement learning, and semi-supervised learning. A few famous algorithms that are covered in this book are: Linear regression, Logistic Regression, SVM, Naive Bayes, K-Means, Random Forest, and Feature engineering. In this course, you will also learn how these algorithms work and their practical implementation to resolve your problems."--Resource description page.

Machine Learning for Beginners

Learn the Basics of Artificial Intelligence. A Step-by-Step Overview to the Fundamentals of Machine Learning and Data Science (2022 Guide)

Do you need a better knowledge of the possibilities existing in the artificial intelligence available today? Do you want to know how big data will shape the future? Do you want to achieve a professional understanding of the most commonly used machine learning models? Machine learning is a branch of artificial intelligence and computer science becoming increasingly relevant in our modern world. It's a relatively new and progressive way of allowing a computer model to improve over time as it is introduced to more data. With the widespread availability of computers today, most machine

learning techniques can be done at home. From the GPS on our phones to the future of self-driving cars, machine learning is becoming more relevant to our lives every day. Every time our email inbox sorts spam emails, there is a machine learning model. When we use voice recognition on our phones, neural networks sort and analyze our words. This book will give you the key terms and basic understanding of the fastest-growing field in computer science as well as: A breakdown of machine learning techniques and algorithms; why and how they are used The tools you will need. Where to find data, what languages work best for machine learning, and what technology is available to help you. Practical examples of Machine Learning being used in the modern world The basic statistics and mathematics necessary to understand and interpret data A jumping-off point to begin diving into this fascinating technology And Much More!.... Even if you aren't an expert in mathematics or computer programming, you will learn the basics of machine learning from this book. If you are ready to know how machine learning models work, check out this guidebook now to help you get started!...