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Hands On Machine Learning With Scikit Learn And Tensorflow Concepts Tools And Techniques To Build Intelligent Systems

For many researchers, Python is a first-class tool mainly because of its libraries for storing, manipulating, and gaining insight from data. Several resources exist for individual pieces of this data science stack, but only with the Python Data Science Handbook do you get them all—IPython, NumPy, Pandas, Matplotlib, Scikit-Learn, and other related tools. Working scientists and data crunchers familiar with reading and writing Python code will find this comprehensive desk reference ideal for tackling day-to-day issues: manipulating, transforming, and cleaning data; visualizing different types of data; and using data to build statistical or machine learning models. Quite simply, this is the must-have reference for scientific computing in Python. With this handbook, you'll learn how to use: IPython and Jupyter: provide computational environments for data scientists using Python NumPy: includes the ndarray for efficient storage and manipulation of dense data arrays in Python Pandas: features the DataFrame for efficient storage and manipulation of labeled/columnar data in Python Matplotlib: includes capabilities for a flexible range of data visualizations in Python Scikit-Learn: for efficient and clean Python implementations of the most important and established machine learning algorithms The purpose of this book is two-fold, we focus on detailed coverage of deep learning and transfer learning, comparing and contrasting the two with easy-to-follow concepts and examples. The second area of focus is on real-world

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examples and research problems using TensorFlow, Keras and Python ecosystem with hands-on examples.

This book is your guide to exploring the possibilities in the field of deep learning, making use of Google's TensorFlow. You will learn about convolutional neural networks, and logistic regression while training models for deep learning to gain key insights into your data. About This Book Explore various possibilities with deep learning and gain amazing insights from data using Google's brainchild-- TensorFlow Want to learn what more can be done with deep learning? Explore various neural networks with the help of this comprehensive guide Rich in concepts, advanced guide on deep learning that will give you background to innovate in your environment Who This Book Is For If you are a data scientist who performs machine learning on a regular basis, are familiar with deep neural networks, and now want to gain expertise in working with convoluted neural networks, then this book is for you. Some familiarity with C++ or Python is assumed. What You Will Learn Set up your computing environment and install TensorFlow Build simple TensorFlow graphs for everyday computations Apply logistic regression for classification with TensorFlow Design and train a multilayer neural network with TensorFlow Intuitively understand convolutional neural networks for image recognition Bootstrap a neural network from simple to more accurate models See how to use TensorFlow with other types of networks Program networks with SciKit-Flow, a high-level interface to TensorFlow In Detail Dan Van Boxel's Deep Learning with TensorFlow is based on Dan's best-selling TensorFlow video course. With deep learning going mainstream, making sense of data and getting accurate results using deep networks is possible. Dan Van Boxel will be your guide to exploring the possibilities with deep learning; he will enable you to understand data like never before. With

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the efficiency and simplicity of TensorFlow, you will be able to process your data and gain insights that will change how you look at data. With Dan's guidance, you will dig deeper into the hidden layers of abstraction using raw data. Dan then shows you various complex algorithms for deep learning and various examples that use these deep neural networks. You will also learn how to train your machine to craft new features to make sense of deeper layers of data. In this book, Dan shares his knowledge across topics such as logistic regression, convolutional neural networks, recurrent neural networks, training deep networks, and high level interfaces. With the help of novel practical examples, you will become an ace at advanced multilayer networks, image recognition, and beyond. **Style and Approach** This book is your go-to guide to becoming a deep learning expert in your organization. Dan helps you evaluate common and not-so-common deep neural networks with the help of insightful examples that you can relate to, and show how they can be exploited in the real world with complex raw data.

Machine learning has become an integral part of many commercial applications and research projects, but this field is not exclusive to large companies with extensive research teams. If you use Python, even as a beginner, this book will teach you practical ways to build your own machine learning solutions. With all the data available today, machine learning applications are limited only by your imagination. You'll learn the steps necessary to create a successful machine-learning application with Python and the scikit-learn library. Authors Andreas Müller and Sarah Guido focus on the practical aspects of using machine learning algorithms, rather than the math behind them. Familiarity with the NumPy and matplotlib libraries will help you get even more from this book. With this book, you'll learn: Fundamental concepts and applications of machine learning Advantages and shortcomings of widely

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used machine learning algorithms How to represent data processed by machine learning, including which data aspects to focus on Advanced methods for model evaluation and parameter tuning The concept of pipelines for chaining models and encapsulating your workflow Methods for working with text data, including text-specific processing techniques Suggestions for improving your machine learning and data science skills

Implement key reinforcement learning algorithms and techniques using different R packages such as the Markov chain, MDP toolbox, contextual, and OpenAI Gym Key Features Explore the design principles of reinforcement learning and deep reinforcement learning models Use dynamic programming to solve design issues related to building a self-learning system Learn how to systematically implement reinforcement learning algorithms Book Description Reinforcement learning (RL) is an integral part of machine learning (ML), and is used to train algorithms. With this book, you'll learn how to implement reinforcement learning with R, exploring practical examples such as using tabular Q-learning to control robots. You'll begin by learning the basic RL concepts, covering the agent-environment interface, Markov Decision Processes (MDPs), and policy gradient methods. You'll then use R's libraries to develop a model based on Markov chains. You will also learn how to solve a multi-armed bandit problem using various R packages. By applying dynamic programming and Monte Carlo methods, you will also find the best policy to make predictions. As you progress, you'll use Temporal Difference (TD) learning for vehicle routing problem applications. Gradually, you'll apply the concepts you've learned to real-world problems, including fraud detection in finance, and TD learning for planning activities in the healthcare sector. You'll explore deep reinforcement learning using Keras, which uses

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the power of neural networks to increase RL's potential. Finally, you'll discover the scope of RL and explore the challenges in building and deploying machine learning models. By the end of this book, you'll be well-versed with RL and have the skills you need to efficiently implement it with R. What you will learn Understand how to use MDP to manage complex scenarios Solve classic reinforcement learning problems such as the multi-armed bandit model Use dynamic programming for optimal policy searching Adopt Monte Carlo methods for prediction Apply TD learning to search for the best path Use tabular Q-learning to control robots Handle environments using the OpenAI library to simulate real-world applications Develop deep Q-learning algorithms to improve model performance Who this book is for This book is for anyone who wants to learn about reinforcement learning with R from scratch. A solid understanding of R and basic knowledge of machine learning are necessary to grasp the topics covered in the book.

Implement supervised and unsupervised machine learning algorithms using C++ libraries such as PyTorch C++ API, Caffe2, Shogun, Shark-ML, mlpack, and dlib with the help of real-world examples and datasets Key Features Become familiar with data processing, performance measuring, and model selection using various C++ libraries Implement practical machine learning and deep learning techniques to build smart models Deploy machine learning models to work on mobile and embedded devices Book Description C++ can make your machine learning models run faster and more efficiently. This handy guide will help you learn the fundamentals of machine learning (ML), showing you how to use C++ libraries to get the most out of your data. This book makes machine learning with C++ for beginners easy with its example-based approach, demonstrating how to implement supervised and unsupervised ML algorithms through real-

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world examples. This book will get you hands-on with tuning and optimizing a model for different use cases, assisting you with model selection and the measurement of performance. You'll cover techniques such as product recommendations, ensemble learning, and anomaly detection using modern C++ libraries such as PyTorch C++ API, Caffe2, Shogun, Shark-ML, mlpack, and dlib. Next, you'll explore neural networks and deep learning using examples such as image classification and sentiment analysis, which will help you solve various problems. Later, you'll learn how to handle production and deployment challenges on mobile and cloud platforms, before discovering how to export and import models using the ONNX format. By the end of this C++ book, you will have real-world machine learning and C++ knowledge, as well as the skills to use C++ to build powerful ML systems. What you will learn

- Explore how to load and preprocess various data types to suitable C++ data structures
- Employ key machine learning algorithms with various C++ libraries
- Understand the grid-search approach to find the best parameters for a machine learning model
- Implement an algorithm for filtering anomalies in user data using Gaussian distribution
- Improve collaborative filtering to deal with dynamic user preferences
- Use C++ libraries and APIs to manage model structures and parameters
- Implement a C++ program to solve image classification tasks with LeNet architecture

Who this book is for You will find this C++ machine learning book useful if you want to get started with machine learning algorithms and techniques using the popular C++ language. As well as being a useful first course in machine learning with C++, this book will also appeal to data analysts, data scientists, and machine learning developers who are looking to implement different machine learning models in production using varied datasets and examples. Working knowledge of the C++ programming

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language is mandatory to get started with this book.

ORPHAN, CLOCK KEEPER, AND THIEF, twelve-year-old Hugo lives in the walls of a busy Paris train station, where his survival depends on secrets and anonymity. But when his world suddenly interlocks with an eccentric girl and her grandfather, Hugo's undercover life, and his most precious secret, are put in jeopardy. A cryptic drawing, a treasured notebook, a stolen key, a mechanical man, and a hidden message from Hugo's dead father form the backbone of this intricate, tender, and spellbinding mystery.

This friendly and accessible guide to AI theory and programming in Python requires no maths or data science background. Key Features Roll up your sleeves and start programming AI models No math, data science, or machine learning background required Packed with hands-on examples, illustrations, and clear step-by-step instructions 5 hands-on working projects put ideas into action and show step-by-step how to build intelligent software Book Description AI is changing the world – and with this book, anyone can start building intelligent software! Through his best-selling video courses, Hadelin de Ponteves has taught hundreds of thousands of people to write AI software. Now, for the first time, his hands-on, energetic approach is available as a book. Taking a graduated approach that starts with the basics before easing readers into more complicated formulas and notation, Hadelin helps you understand what you really need to build AI systems with reinforcement learning and deep learning. Five full working projects put the ideas into action, showing step-by-step how to build intelligent software using the best and easiest tools for AI programming: Google Colab Python TensorFlow Keras PyTorch AI Crash Course teaches everyone to build an AI to work in their applications. Once you've read this book, you're only limited by your imagination. What you will learn Master the key skills

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of deep learning, reinforcement learning, and deep reinforcement learning Understand Q-learning and deep Q-learning Learn from friendly, plain English explanations and practical activities Build fun projects, including a virtual-self-driving car Use AI to solve real-world business problems and win classic video games Build an intelligent, virtual robot warehouse worker Who this book is for If you want to add AI to your skillset, this book is for you. It doesn't require data science or machine learning knowledge. Just maths basics (high school level).

Reinforcement learning is a self-evolving type of machine learning that takes us closer to achieving true artificial intelligence. This easy-to-follow guide explains everything from scratch using rich examples written in Python.

Every other day we hear about new ways to put deep learning to good use: improved medical imaging, accurate credit card fraud detection, long range weather forecasting, and more. PyTorch puts these superpowers in your hands, providing a comfortable Python experience that gets you started quickly and then grows with you as you—and your deep learning skills—become more sophisticated. Deep Learning with PyTorch will make that journey engaging and fun. Summary Every other day we hear about new ways to put deep learning to good use: improved medical imaging, accurate credit card fraud detection, long range weather forecasting, and more. PyTorch puts these superpowers in your hands, providing a comfortable Python experience

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that gets you started quickly and then grows with you as you—and your deep learning skills—become more sophisticated. Deep Learning with PyTorch will make that journey engaging and fun. Foreword by Soumith Chintala, Cocreator of PyTorch. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology Although many deep learning tools use Python, the PyTorch library is truly Pythonic. Instantly familiar to anyone who knows PyData tools like NumPy and scikit-learn, PyTorch simplifies deep learning without sacrificing advanced features. It's excellent for building quick models, and it scales smoothly from laptop to enterprise. Because companies like Apple, Facebook, and JPMorgan Chase rely on PyTorch, it's a great skill to have as you expand your career options. It's easy to get started with PyTorch. It minimizes cognitive overhead without sacrificing the access to advanced features, meaning you can focus on what matters the most - building and training the latest and greatest deep learning models and contribute to making a dent in the world. PyTorch is also a snap to scale and extend, and it partners well with other Python tooling. PyTorch has been adopted by hundreds of deep learning practitioners and several first-class players like FAIR, OpenAI, FastAI and Purdue. About the book Deep Learning with PyTorch teaches you to create neural networks and deep

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learning systems with PyTorch. This practical book quickly gets you to work building a real-world example from scratch: a tumor image classifier. Along the way, it covers best practices for the entire DL pipeline, including the PyTorch Tensor API, loading data in Python, monitoring training, and visualizing results. After covering the basics, the book will take you on a journey through larger projects. The centerpiece of the book is a neural network designed for cancer detection. You'll discover ways for training networks with limited inputs and start processing data to get some results. You'll sift through the unreliable initial results and focus on how to diagnose and fix the problems in your neural network. Finally, you'll look at ways to improve your results by training with augmented data, make improvements to the model architecture, and perform other fine tuning. What's inside Training deep neural networks Implementing modules and loss functions Utilizing pretrained models from PyTorch Hub Exploring code samples in Jupyter Notebooks About the reader For Python programmers with an interest in machine learning. About the author Eli Stevens had roles from software engineer to CTO, and is currently working on machine learning in the self-driving-car industry. Luca Antiga is cofounder of an AI engineering company and an AI tech startup, as well as a former PyTorch contributor. Thomas Viehmann is a

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PyTorch core developer and machine learning trainer and consultant. consultant based in Munich, Germany and a PyTorch core developer. Table of Contents PART 1 - CORE PYTORCH 1 Introducing deep learning and the PyTorch Library 2 Pretrained networks 3 It starts with a tensor 4 Real-world data representation using tensors 5 The mechanics of learning 6 Using a neural network to fit the data 7 Telling birds from airplanes: Learning from images 8 Using convolutions to generalize PART 2 - LEARNING FROM IMAGES IN THE REAL WORLD: EARLY DETECTION OF LUNG CANCER 9 Using PyTorch to fight cancer 10 Combining data sources into a unified dataset 11 Training a classification model to detect suspected tumors 12 Improving training with metrics and augmentation 13 Using segmentation to find suspected nodules 14 End-to-end nodule analysis, and where to go next PART 3 - DEPLOYMENT 15 Deploying to production Many industry experts consider unsupervised learning the next frontier in artificial intelligence, one that may hold the key to general artificial intelligence. Since the majority of the world's data is unlabeled, conventional supervised learning cannot be applied. Unsupervised learning, on the other hand, can be applied to unlabeled datasets to discover meaningful patterns buried deep in the data, patterns that may be near impossible for humans to uncover. Author Ankur Patel shows you how to apply unsupervised

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learning using two simple, production-ready Python frameworks: Scikit-learn and TensorFlow using Keras. With code and hands-on examples, data scientists will identify difficult-to-find patterns in data and gain deeper business insight, detect anomalies, perform automatic feature engineering and selection, and generate synthetic datasets. All you need is programming and some machine learning experience to get started. Compare the strengths and weaknesses of the different machine learning approaches: supervised, unsupervised, and reinforcement learning Set up and manage machine learning projects end-to-end Build an anomaly detection system to catch credit card fraud Clusters users into distinct and homogeneous groups Perform semisupervised learning Develop movie recommender systems using restricted Boltzmann machines Generate synthetic images using generative adversarial networks Automate data and model pipelines for faster machine learning applications Key Features Build automated modules for different machine learning components Understand each component of a machine learning pipeline in depth Learn to use different open source AutoML and feature engineering platforms Book Description AutoML is designed to automate parts of Machine Learning. Readily available AutoML tools are making data science practitioners' work easy and are received

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well in the advanced analytics community.

Automated Machine Learning covers the necessary foundation needed to create automated machine learning modules and helps you get up to speed with them in the most practical way possible. In this book, you'll learn how to automate different tasks in the machine learning pipeline such as data preprocessing, feature selection, model training, model optimization, and much more. In addition to this, it demonstrates how you can use the available automation libraries, such as auto-sklearn and MLBox, and create and extend your own custom AutoML components for Machine Learning. By the end of this book, you will have a clearer understanding of the different aspects of automated Machine Learning, and you'll be able to incorporate automation tasks using practical datasets. You can leverage your learning from this book to implement Machine Learning in your projects and get a step closer to winning various machine learning competitions. What you will learn

- Understand the fundamentals of Automated Machine Learning systems
- Explore auto-sklearn and MLBox for AutoML tasks
- Automate your preprocessing methods along with feature transformation
- Enhance feature selection and generation using the Python stack
- Assemble individual components of ML into a complete AutoML framework
- Demystify hyperparameter tuning to optimize your ML models

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Dive into Machine Learning concepts such as neural networks and autoencoders Understand the information costs and trade-offs associated with AutoML Who this book is for If you're a budding data scientist, data analyst, or Machine Learning enthusiast and are new to the concept of automated machine learning, this book is ideal for you. You'll also find this book useful if you're an ML engineer or data professional interested in developing quick machine learning pipelines for your projects. Prior exposure to Python programming will help you get the best out of this book.

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

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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.

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Data science libraries, frameworks, modules, and toolkits are great for doing data science, but they're also a good way to dive into the discipline without actually understanding data science. In this book, you'll learn how many of the most fundamental data science tools and algorithms work by implementing them from scratch. If you have an aptitude for mathematics and some programming skills, author Joel Grus will help you get comfortable with the math and statistics at the core of data science, and with hacking skills you need to get started as a data scientist. Today's messy glut of data holds answers to questions no one's even thought to ask. This book provides you with the know-how to dig those answers out. Get a crash course in Python Learn the basics of linear algebra, statistics, and probability—and understand how and when they're used in data science Collect, explore, clean, munge, and manipulate data Dive into the fundamentals of machine learning Implement models such as k-nearest Neighbors, Naive Bayes, linear and logistic regression, decision trees, neural networks, and clustering Explore recommender systems, natural language processing, network analysis, MapReduce, and databases

This practical guide will teach you how deep learning (DL) can be used to solve complex real-world problems. Key Features Explore deep reinforcement learning (RL), from the first principles to the latest

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algorithms Evaluate high-profile RL methods, including value iteration, deep Q-networks, policy gradients, TRPO, PPO, DDPG, D4PG, evolution strategies and genetic algorithms Keep up with the very latest industry developments, including AI-driven chatbots Book Description Recent developments in reinforcement learning (RL), combined with deep learning (DL), have seen unprecedented progress made towards training agents to solve complex problems in a human-like way. Google's use of algorithms to play and defeat the well-known Atari arcade games has propelled the field to prominence, and researchers are generating new ideas at a rapid pace. Deep Reinforcement Learning Hands-On is a comprehensive guide to the very latest DL tools and their limitations. You will evaluate methods including Cross-entropy and policy gradients, before applying them to real-world environments. Take on both the Atari set of virtual games and family favorites such as Connect4. The book provides an introduction to the basics of RL, giving you the know-how to code intelligent learning agents to take on a formidable array of practical tasks. Discover how to implement Q-learning on 'grid world' environments, teach your agent to buy and trade stocks, and find out how natural language models are driving the boom in chatbots. What you will learn Understand the DL context of RL and implement complex DL models

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Learn the foundation of RL: Markov decision processes Evaluate RL methods including Cross-entropy, DQN, Actor-Critic, TRPO, PPO, DDPG, D4PG and others Discover how to deal with discrete and continuous action spaces in various environments Defeat Atari arcade games using the value iteration method Create your own OpenAI Gym environment to train a stock trading agent Teach your agent to play Connect4 using AlphaGo Zero Explore the very latest deep RL research on topics including AI-driven chatbots Who this book is for Some fluency in Python is assumed. Basic deep learning (DL) approaches should be familiar to readers and some practical experience in DL will be helpful. This book is an introduction to deep reinforcement learning (RL) and requires no background in RL.

Explore and implement deep learning to solve various real-world problems using modern R libraries such as TensorFlow, MXNet, H2O, and Deepnet Key Features Understand deep learning algorithms and architectures using R and determine which algorithm is best suited for a specific problem Improve models using parameter tuning, feature engineering, and ensembling Apply advanced neural network models such as deep autoencoders and generative adversarial networks (GANs) across different domains Book Description Deep learning enables efficient and accurate learning from a massive

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amount of data. This book will help you overcome a number of challenges using various deep learning algorithms and architectures with R programming. This book starts with a brief overview of machine learning and deep learning and how to build your first neural network. You'll understand the architecture of various deep learning algorithms and their applicable fields, learn how to build deep learning models, optimize hyperparameters, and evaluate model performance. Various deep learning applications in image processing, natural language processing (NLP), recommendation systems, and predictive analytics will also be covered. Later chapters will show you how to tackle recognition problems such as image recognition and signal detection, programmatically summarize documents, conduct topic modeling, and forecast stock market prices. Toward the end of the book, you will learn the common applications of GANs and how to build a face generation model using them. Finally, you'll get to grips with using reinforcement learning and deep reinforcement learning to solve various real-world problems. By the end of this deep learning book, you will be able to build and deploy your own deep learning applications using appropriate frameworks and algorithms. What you will learn

- Design a feedforward neural network to see how the activation function computes an output
- Create an image recognition model using convolutional neural

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networks (CNNs) Prepare data, decide hidden layers and neurons and train your model with the backpropagation algorithm Apply text cleaning techniques to remove uninformative text using NLP Build, train, and evaluate a GAN model for face generation Understand the concept and implementation of reinforcement learning in R Who this book is for This book is for data scientists, machine learning engineers, and deep learning developers who are familiar with machine learning and are looking to enhance their knowledge of deep learning using practical examples. Anyone interested in increasing the efficiency of their machine learning applications and exploring various options in R will also find this book useful. Basic knowledge of machine learning techniques and working knowledge of the R programming language is expected.

Apply modern deep learning techniques to build and train deep neural networks using Gorgonia Key Features Gain a practical understanding of deep learning using Golang Build complex neural network models using Go libraries and Gorgonia Take your deep learning model from design to deployment with this handy guide Book Description Go is an open source programming language designed by Google for handling large-scale projects efficiently. The Go ecosystem comprises some really powerful deep learning tools such as DQN and CUDA. With this book, you'll be able to use these tools to train and deploy scalable deep learning models from scratch. This deep learning book begins by introducing you to a variety of tools and libraries available in Go. It then takes you through building neural networks, including activation

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functions and the learning algorithms that make neural networks tick. In addition to this, you'll learn how to build advanced architectures such as autoencoders, restricted Boltzmann machines (RBMs), convolutional neural networks (CNNs), recurrent neural networks (RNNs), and more. You'll also understand how you can scale model deployments on the AWS cloud infrastructure for training and inference. By the end of this book, you'll have mastered the art of building, training, and deploying deep learning models in Go to solve real-world problems. What you will learn Explore the Go ecosystem of libraries and communities for deep learning Get to grips with Neural Networks, their history, and how they work Design and implement Deep Neural Networks in Go Get a strong foundation of concepts such as Backpropagation and Momentum Build Variational Autoencoders and Restricted Boltzmann Machines using Go Build models with CUDA and benchmark CPU and GPU models Who this book is for This book is for data scientists, machine learning engineers, and AI developers who want to build state-of-the-art deep learning models using Go. Familiarity with basic machine learning concepts and Go programming is required to get the best out of this book.

Create, train, and evaluate various machine learning models such as regression, classification, and clustering using ML.NET, Entity Framework, and ASP.NET Core Key Features Get well-versed with the ML.NET framework and its components and APIs using practical examples Learn how to build, train, and evaluate popular machine learning algorithms with ML.NET offerings Extend your existing machine learning models by integrating with TensorFlow and other libraries Book Description Machine learning (ML) is widely used in many industries such as science, healthcare, and research and its popularity is only growing. In March 2018, Microsoft introduced ML.NET to help .NET enthusiasts in working with

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ML. With this book, you'll explore how to build ML.NET applications with the various ML models available using C# code. The book starts by giving you an overview of ML and the types of ML algorithms used, along with covering what ML.NET is and why you need it to build ML apps. You'll then explore the ML.NET framework, its components, and APIs. The book will serve as a practical guide to helping you build smart apps using the ML.NET library. You'll gradually become well versed in how to implement ML algorithms such as regression, classification, and clustering with real-world examples and datasets. Each chapter will cover the practical implementation, showing you how to implement ML within .NET applications. You'll also learn to integrate TensorFlow in ML.NET applications. Later you'll discover how to store the regression model housing price prediction result to the database and display the real-time predicted results from the database on your web application using ASP.NET Core Blazor and SignalR. By the end of this book, you'll have learned how to confidently perform basic to advanced-level machine learning tasks in ML.NET. What you will learn

- Understand the framework, components, and APIs of ML.NET using C#
- Develop regression models using ML.NET for employee attrition and file classification
- Evaluate classification models for sentiment prediction of restaurant reviews
- Work with clustering models for file type classifications
- Use anomaly detection to find anomalies in both network traffic and login history
- Work with ASP.NET Core Blazor to create an ML.NET enabled web application
- Integrate pre-trained TensorFlow and ONNX models in a WPF ML.NET application for image classification and object detection

Who this book is for If you are a .NET developer who wants to implement machine learning models using ML.NET, then this book is for you. This book will also be beneficial for data scientists and machine learning developers

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who are looking for effective tools to implement various machine learning algorithms. A basic understanding of C# or .NET is mandatory to grasp the concepts covered in this book effectively.

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

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 Aurlien Gron helps you gain an intuitive

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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 Apply practical code examples without acquiring excessive machine learning theory or algorithm details

A definitive guide to creating an intelligent web application with the best of machine learning and JavaScript Key Features Solve complex computational problems in browser with JavaScript Teach your browser how to learn from rules using the power of machine learning Understand discoveries on web interface and API in machine learning Book Description In over 20 years of existence, JavaScript has been pushing beyond the boundaries of web evolution with proven existence on servers, embedded devices, Smart TVs, IoT, Smart Cars, and more. Today, with the added advantage of machine learning research and support for JS libraries, JavaScript makes your browsers smarter than ever with the ability to learn patterns and reproduce them to become a part of innovative products and applications. Hands-on Machine Learning with JavaScript presents various avenues of machine learning in a practical and objective way, and helps implement them using the JavaScript language. Predicting behaviors, analyzing feelings, grouping data, and building

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neural models are some of the skills you will build from this book. You will learn how to train your machine learning models and work with different kinds of data. During this journey, you will come across use cases such as face detection, spam filtering, recommendation systems, character recognition, and more. Moreover, you will learn how to work with deep neural networks and guide your applications to gain insights from data. By the end of this book, you'll have gained hands-on knowledge on evaluating and implementing the right model, along with choosing from different JS libraries, such as NaturalNode, brain, harthur, classifier, and many more to design smarter applications. What you will learn

- Get an overview of state-of-the-art machine learning
- Understand the pre-processing of data handling, cleaning, and preparation
- Learn Mining and Pattern Extraction with JavaScript
- Build your own model for classification, clustering, and prediction
- Identify the most appropriate model for each type of problem
- Apply machine learning techniques to real-world applications
- Learn how JavaScript can be a powerful language for machine learning

Who this book is for This book is for you if you are a JavaScript developer who wants to implement machine learning to make applications smarter, gain insightful information from the data, and enter the field of machine learning without switching to another language. Working knowledge of JavaScript language is expected to get the most out of the book.

A comprehensive guide to getting well-versed with the mathematical techniques for building modern deep learning architectures

- Key Features
- Understand linear algebra, calculus, gradient algorithms, and other concepts essential for training deep neural networks
- Learn the mathematical concepts needed to understand how deep learning models function
- Use deep learning for solving problems related to vision, image, text, and sequence applications

Book

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Description Most programmers and data scientists struggle with mathematics, having either overlooked or forgotten core mathematical concepts. This book uses Python libraries to help you understand the math required to build deep learning (DL) models. You'll begin by learning about core mathematical and modern computational techniques used to design and implement DL algorithms. This book will cover essential topics, such as linear algebra, eigenvalues and eigenvectors, the singular value decomposition concept, and gradient algorithms, to help you understand how to train deep neural networks. Later chapters focus on important neural networks, such as the linear neural network and multilayer perceptrons, with a primary focus on helping you learn how each model works. As you advance, you will delve into the math used for regularization, multi-layered DL, forward propagation, optimization, and backpropagation techniques to understand what it takes to build full-fledged DL models. Finally, you'll explore CNN, recurrent neural network (RNN), and GAN models and their application. By the end of this book, you'll have built a strong foundation in neural networks and DL mathematical concepts, which will help you to confidently research and build custom models in DL. What you will learn Understand the key mathematical concepts for building neural network models Discover core multivariable calculus concepts Improve the performance of deep learning models using optimization techniques Cover optimization algorithms, from basic stochastic gradient descent (SGD) to the advanced Adam optimizer Understand computational graphs and their importance in DL Explore the backpropagation algorithm to reduce output error Cover DL algorithms such as convolutional neural networks (CNNs), sequence models, and generative adversarial networks (GANs) Who this book is for This book is for data scientists, machine learning developers, aspiring deep learning

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developers, or anyone who wants to understand the foundation of deep learning by learning the math behind it. Working knowledge of the Python programming language and machine learning basics is required.

Endorsed by top AI authors, academics and industry leaders, The Hundred-Page Machine Learning Book is the number one bestseller on Amazon and the most recommended book for starters and experienced professionals alike.

An introductory textbook offering a low barrier entry to data science; the hands-on approach will appeal to students from a range of disciplines.

Get hands-on with the browser-based JavaScript library for training and deploying machine learning models effectively Key Features Build, train and run machine learning models in the browser using TensorFlow.js Create smart web applications from scratch with the help of useful examples Use flexible and intuitive APIs from TensorFlow.js to understand how machine learning algorithms function Book Description TensorFlow.js is a framework that enables you to create performant machine learning (ML) applications that run smoothly in a web browser. With this book, you will learn how to use TensorFlow.js to implement various ML models through an example-based approach. Starting with the basics, you'll understand how ML models can be built on the web. Moving on, you will get to grips with the TensorFlow.js ecosystem to develop applications more efficiently. The book will then guide you through implementing ML techniques and algorithms

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such as regression, clustering, fast Fourier transform (FFT), and dimensionality reduction. You will later cover the Bellman equation to solve Markov decision process (MDP) problems and understand how it is related to reinforcement learning. Finally, you will explore techniques for deploying ML-based web applications and training models with TensorFlow Core. Throughout this ML book, you'll discover useful tips and tricks that will build on your knowledge. By the end of this book, you will be equipped with the skills you need to create your own web-based ML applications and fine-tune models to achieve high performance. What you will learn

- Use the t-SNE algorithm in TensorFlow.js to reduce dimensions in an input dataset
- Deploy tfjs-converter to convert Keras models and load them into TensorFlow.js
- Apply the Bellman equation to solve MDP problems
- Use the k-means algorithm in TensorFlow.js to visualize prediction results
- Create tf.js packages with Parcel, Webpack, and Rollup to deploy web apps
- Implement tf.js backend frameworks to tune and accelerate app performance

Who this book is for This book is for web developers who want to learn how to integrate machine learning techniques with web-based applications from scratch. This book will also appeal to data scientists, machine learning practitioners, and deep learning enthusiasts who are looking to perform accelerated, browser-based machine learning on Web using

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TensorFlow.js. Working knowledge of JavaScript programming language is all you need to get started. Get into the world of smart data security using machine learning algorithms and Python libraries

Key Features

Learn machine learning algorithms and cybersecurity fundamentals Automate your daily workflow by applying use cases to many facets of security Implement smart machine learning solutions to detect various cybersecurity problems

Book Description

Cyber threats today are one of the costliest losses that an organization can face. In this book, we use the most efficient tool to solve the big problems that exist in the cybersecurity domain. The book begins by giving you the basics of ML in cybersecurity using Python and its libraries. You will explore various ML domains (such as time series analysis and ensemble modeling) to get your foundations right. You will implement various examples such as building system to identify malicious URLs, and building a program to detect fraudulent emails and spam. Later, you will learn how to make effective use of K-means algorithm to develop a solution to detect and alert you to any malicious activity in the network. Also learn how to implement biometrics and fingerprint to validate whether the user is a legitimate user or not. Finally, you will see how we change the game with TensorFlow and learn how deep learning is effective for creating models and training systems

What you

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will learn Use machine learning algorithms with complex datasets to implement cybersecurity concepts Implement machine learning algorithms such as clustering, k-means, and Naive Bayes to solve real-world problems Learn to speed up a system using Python libraries with NumPy, Scikit-learn, and CUDA Understand how to combat malware, detect spam, and fight financial fraud to mitigate cyber crimes Use TensorFlow in the cybersecurity domain and implement real-world examples Learn how machine learning and Python can be used in complex cyber issues Who this book is for This book is for the data scientists, machine learning developers, security researchers, and anyone keen to apply machine learning to up-skill computer security. Having some working knowledge of Python and being familiar with the basics of machine learning and cybersecurity fundamentals will help to get the most out of the book

Discover the skill-sets required to implement various approaches to Machine Learning with Python Key Features Explore unsupervised learning with clustering, autoencoders, restricted Boltzmann machines, and more Build your own neural network models using modern Python libraries Practical examples show you how to implement different machine learning and deep learning techniques Book Description Unsupervised learning is about making use of raw, untagged data and applying

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learning algorithms to it to help a machine predict its outcome. With this book, you will explore the concept of unsupervised learning to cluster large sets of data and analyze them repeatedly until the desired outcome is found using Python. This book starts with the key differences between supervised, unsupervised, and semi-supervised learning. You will be introduced to the best-used libraries and frameworks from the Python ecosystem and address unsupervised learning in both the machine learning and deep learning domains. You will explore various algorithms, techniques that are used to implement unsupervised learning in real-world use cases. You will learn a variety of unsupervised learning approaches, including randomized optimization, clustering, feature selection and transformation, and information theory. You will get hands-on experience with how neural networks can be employed in unsupervised scenarios. You will also explore the steps involved in building and training a GAN in order to process images. By the end of this book, you will have learned the art of unsupervised learning for different real-world challenges. What you will learn

- Use cluster algorithms to identify and optimize natural groups of data
- Explore advanced non-linear and hierarchical clustering in action
- Soft label assignments for fuzzy c-means and Gaussian mixture models
- Detect anomalies through density estimation
- Perform principal component analysis

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using neural network models Create unsupervised models using GANs Who this book is for This book is intended for statisticians, data scientists, machine learning developers, and deep learning practitioners who want to build smart applications by implementing key building block unsupervised learning, and master all the new techniques and algorithms offered in machine learning and deep learning using real-world examples. Some prior knowledge of machine learning concepts and statistics is desirable.

A practical guide to getting the most out of Excel, using it for data preparation, applying machine learning models (including cloud services) and understanding the outcome of the data analysis. Key Features Use Microsoft's product Excel to build advanced forecasting models using varied examples Cover range of machine learning tasks such as data mining, data analytics, smart visualization, and more Derive data-driven techniques using Excel plugins and APIs without much code required Book Description We have made huge progress in teaching computers to perform difficult tasks, especially those that are repetitive and time-consuming for humans. Excel users, of all levels, can feel left behind by this innovation wave. The truth is that a large amount of the work needed to develop and use a machine learning model can be done in Excel. The book starts by giving a general

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introduction to machine learning, making every concept clear and understandable. Then, it shows every step of a machine learning project, from data collection, reading from different data sources, developing models, and visualizing the results using Excel features and offerings. In every chapter, there are several examples and hands-on exercises that will show the reader how to combine Excel functions, add-ins, and connections to databases and to cloud services to reach the desired goal: building a full data analysis flow. Different machine learning models are shown, tailored to the type of data to be analyzed. At the end of the book, the reader is presented with some advanced use cases using Automated Machine Learning, and artificial neural network, which simplifies the analysis task and represents the future of machine learning. What you will learn

- Use Excel to preview and cleanse datasets
- Understand correlations between variables and optimize the input to machine learning models
- Use and evaluate different machine learning models from Excel
- Understand the use of different visualizations
- Learn the basic concepts and calculations to understand how artificial neural networks work
- Learn how to connect Excel to the Microsoft Azure cloud
- Get beyond proof of concepts and build fully functional data analysis flows

Who this book is for
This book is for data analysis, machine learning enthusiasts, project managers, and someone who

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doesn't want to code much for performing core tasks of machine learning. Each example will help you perform end-to-end smart analytics. Working knowledge of Excel is required.

Implement machine learning, cognitive services, and artificial intelligence solutions by leveraging Azure cloud technologies Key Features Learn advanced concepts in Azure ML and the Cortana Intelligence Suite architecture Explore ML Server using SQL Server and HDInsight capabilities Implement various tools in Azure to build and deploy machine learning models Book Description Implementing Machine learning (ML) and Artificial Intelligence (AI) in the cloud had not been possible earlier due to the lack of processing power and storage. However, Azure has created ML and AI services that are easy to implement in the cloud. Hands-On Machine Learning with Azure teaches you how to perform advanced ML projects in the cloud in a cost-effective way. The book begins by covering the benefits of ML and AI in the cloud. You will then explore Microsoft's Team Data Science Process to establish a repeatable process for successful AI development and implementation. You will also gain an understanding of AI technologies available in Azure and the Cognitive Services APIs to integrate them into bot applications. This book lets you explore prebuilt templates with Azure Machine Learning Studio and build a model using canned algorithms that can be

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deployed as web services. The book then takes you through a preconfigured series of virtual machines in Azure targeted at AI development scenarios. You will get to grips with the ML Server and its capabilities in SQL and HDInsight. In the concluding chapters, you'll integrate patterns with other non-AI services in Azure. By the end of this book, you will be fully equipped to implement smart cognitive actions in your models. What you will learn Discover the benefits of leveraging the cloud for ML and AI Use Cognitive Services APIs to build intelligent bots Build a model using canned algorithms from Microsoft and deploy it as a web service Deploy virtual machines in AI development scenarios Apply R, Python, SQL Server, and Spark in Azure Build and deploy deep learning solutions with CNTK, MMLSpark, and TensorFlow Implement model retraining in IoT, Streaming, and Blockchain solutions Explore best practices for integrating ML and AI functions with ADLA and logic apps Who this book is for If you are a data scientist or developer familiar with Azure ML and cognitive services and want to create smart models and make sense of data in the cloud, this book is for you. You'll also find this book useful if you want to bring powerful machine learning services into your cloud applications. Some experience with data manipulation and processing, using languages like SQL, Python, and R, will aid in understanding the concepts covered in this book

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Dig deep into the data with a hands-on guide to machine learning with updated examples and more! Machine Learning: Hands-On for Developers and Technical Professionals provides hands-on instruction and fully-coded working examples for the most common machine learning techniques used by developers and technical professionals. The book contains a breakdown of each ML variant, explaining how it works and how it is used within certain industries, allowing readers to incorporate the presented techniques into their own work as they follow along. A core tenant of machine learning is a strong focus on data preparation, and a full exploration of the various types of learning algorithms illustrates how the proper tools can help any developer extract information and insights from existing data. The book includes a full complement of Instructor's Materials to facilitate use in the classroom, making this resource useful for students and as a professional reference. At its core, machine learning is a mathematical, algorithm-based technology that forms the basis of historical data mining and modern big data science. Scientific analysis of big data requires a working knowledge of machine learning, which forms predictions based on known properties learned from training data. Machine Learning is an accessible, comprehensive guide for the non-mathematician, providing clear guidance that allows readers to: Learn the

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languages of machine learning including Hadoop, Mahout, and Weka Understand decision trees, Bayesian networks, and artificial neural networks Implement Association Rule, Real Time, and Batch learning Develop a strategic plan for safe, effective, and efficient machine learning By learning to construct a system that can learn from data, readers can increase their utility across industries. Machine learning sits at the core of deep dive data analysis and visualization, which is increasingly in demand as companies discover the goldmine hiding in their existing data. For the tech professional involved in data science, *Machine Learning: Hands-On for Developers and Technical Professionals* provides the skills and techniques required to dig deeper. With the help of this book, you'll build smart algorithmic models using machine learning algorithms covering tasks such as time series forecasting, backtesting, trade predictions, and more using easy-to-follow examples. By the end, you'll be able to adopt algorithmic trading in your own business and implement intelligent investigative strategies.

This book introduces basic-to-advanced deep learning algorithms used in a production environment by AI researchers and principal data scientists; it explains algorithms intuitively, including the underlying math, and shows how to implement them using popular Python-based deep learning

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libraries such as TensorFlow.

Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow Concepts, Tools, and Techniques to Build Intelligent Systems O'Reilly Media

In this book, you will learn how to create powerful machine learning based applications for a wide variety of problems leveraging different data services from the Google Cloud Platform. Finally, you will know the main difficulties that you may encounter and get appropriate strategies to overcome these difficulties and build efficient systems.

Get complete instructions for manipulating, processing, cleaning, and crunching datasets in Python. Updated for Python 3.6, the second edition of this hands-on guide is packed with practical case studies that show you how to solve a broad set of data analysis problems effectively. You'll learn the latest versions of pandas, NumPy, IPython, and Jupyter in the process. Written by Wes McKinney, the creator of the Python pandas project, this book is a practical, modern introduction to data science tools in Python. It's ideal for analysts new to Python and for Python programmers new to data science and scientific computing. Data files and related material are available on GitHub. Use the IPython shell and Jupyter notebook for exploratory computing Learn basic and advanced features in NumPy (Numerical Python) Get started with data analysis tools in the

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pandas library Use flexible tools to load, clean, transform, merge, and reshape data Create informative visualizations with matplotlib Apply the pandas groupby facility to slice, dice, and summarize datasets Analyze and manipulate regular and irregular time series data Learn how to solve real-world data analysis problems with thorough, detailed examples

Integrate scikit-learn with various tools such as NumPy, pandas, imbalanced-learn, and scikit-surprise and use it to solve real-world machine learning problems Key Features Delve into machine learning with this comprehensive guide to scikit-learn and scientific Python Master the art of data-driven problem-solving with hands-on examples Foster your theoretical and practical knowledge of supervised and unsupervised machine learning algorithms Book Description Machine learning is applied everywhere, from business to research and academia, while scikit-learn is a versatile library that is popular among machine learning practitioners. This book serves as a practical guide for anyone looking to provide hands-on machine learning solutions with scikit-learn and Python toolkits. The book begins with an explanation of machine learning concepts and fundamentals, and strikes a balance between theoretical concepts and their applications. Each chapter covers a different set of algorithms, and shows you how to use them to solve real-life problems. You'll also learn about

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various key supervised and unsupervised machine learning algorithms using practical examples.

Whether it is an instance-based learning algorithm, Bayesian estimation, a deep neural network, a tree-based ensemble, or a recommendation system, you'll gain a thorough understanding of its theory and learn when to apply it. As you advance, you'll learn how to deal with unlabeled data and when to use different clustering and anomaly detection algorithms. By the end of this machine learning book, you'll have learned how to take a data-driven approach to provide end-to-end machine learning solutions. You'll also have discovered how to formulate the problem at hand, prepare required data, and evaluate and deploy models in production.

What you will learn

- Understand when to use supervised, unsupervised, or reinforcement learning algorithms
- Find out how to collect and prepare your data for machine learning tasks
- Tackle imbalanced data and optimize your algorithm for a bias or variance tradeoff
- Apply supervised and unsupervised algorithms to overcome various machine learning challenges
- Employ best practices for tuning your algorithm's hyper parameters
- Discover how to use neural networks for classification and regression
- Build, evaluate, and deploy your machine learning solutions to production

Who this book is for

This book is for data scientists, machine learning practitioners, and anyone who

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wants to learn how machine learning algorithms work and to build different machine learning models using the Python ecosystem. The book will help you take your knowledge of machine learning to the next level by grasping its ins and outs and tailoring it to your needs. Working knowledge of Python and a basic understanding of underlying mathematical and statistical concepts is required.

This book offers a highly accessible introduction to natural language processing, the field that supports a variety of language technologies, from predictive text and email filtering to automatic summarization and translation. With it, you'll learn how to write Python programs that work with large collections of unstructured text. You'll access richly annotated datasets using a comprehensive range of linguistic data structures, and you'll understand the main algorithms for analyzing the content and structure of written communication. Packed with examples and exercises, *Natural Language Processing with Python* will help you: Extract information from unstructured text, either to guess the topic or identify "named entities" Analyze linguistic structure in text, including parsing and semantic analysis Access popular linguistic databases, including WordNet and treebanks Integrate techniques drawn from fields as diverse as linguistics and artificial intelligence This book will help you gain practical skills in natural language processing using the Python programming

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language and the Natural Language Toolkit (NLTK) open source library. If you're interested in developing web applications, analyzing multilingual news sources, or documenting endangered languages -- or if you're simply curious to have a programmer's perspective on how human language works -- you'll find Natural Language Processing with Python both fascinating and immensely useful.

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

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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.

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