

# Read Online Deep Learning 2 Manuscripts Deep Learning With Keras And Convolutional Neural Networks In Python Pdf For Free

Deep Learning Deep Learning with R Advanced Deep Learning with R The Deep Learning with Keras Workshop Deep Learning with PyTorch Deep Learning with Keras Deep Learning Deep Learning with Python Deep Learning with Keras MATLAB Deep Learning Deep Learning Essentials The Deep Learning Revolution Neural Networks and Deep Learning Hands-On Transfer Learning with Python Deep Learning with Structured Data Deep Learning with JavaScript Deep Learning with PyTorch Grokking Artificial Intelligence Algorithms Deep Learning Deep Learning for Coders with fastai and PyTorch Deep Learning for Search Grokking Deep Learning Deep Learning with R Deep Learning with TensorFlow Introduction to Deep Learning and Neural Networks with Python™ Deep Learning and the Game of Go Deep Learning on Graphs Hands-On Deep Learning with Go Deep Learning and Practice with MindSpore Deep Learning Illustrated Deep Learning from the Basics Applied Deep Learning Pro Deep Learning with TensorFlow Codeless Deep Learning with KNIME Multi-faceted Deep Learning Deep Learning from Scratch Advanced Deep Learning with Python Learning Deep Learning Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow Introduction to Deep Learning

Delve into neural networks, implement deep learning algorithms, and explore layers of data abstraction with the help of this comprehensive TensorFlow guide About This Book Learn how to implement advanced techniques in deep learning with Google's brainchild, TensorFlow Explore deep neural networks and layers of data abstraction with the help of this comprehensive guide Real-world contextualization through some deep learning problems concerning research and application Who This Book Is For The book is intended for a general audience of people interested in machine learning and machine intelligence. A rudimentary level of programming in one language is assumed, as is a basic familiarity with computer science techniques and technologies, including a basic awareness of computer hardware and algorithms. Some competence in mathematics is needed to the level of elementary linear algebra and calculus. What You Will Learn Learn about machine learning landscapes along with the historical development and progress of deep learning Learn about deep machine intelligence and GPU computing with the latest TensorFlow 1.x Access public datasets and utilize them using TensorFlow to load, process, and transform data Use TensorFlow on real-world datasets, including images, text, and more Learn how to evaluate the performance of your deep learning models Using deep learning for scalable object detection and mobile computing Train machines quickly to learn from data by exploring reinforcement learning techniques Explore active areas of deep learning research and applications In Detail Deep learning is the step that comes after machine learning, and has more advanced implementations. Machine learning is not just for academics anymore, but is becoming a mainstream practice through wide adoption, and deep learning has taken the front seat. As a data scientist, if you want to explore data abstraction layers, this book will be your guide. This book shows how this can be exploited in the real world with complex raw data using TensorFlow 1.x. Throughout the book, you'll learn how to implement deep learning algorithms for machine learning systems and integrate them into your product offerings, including search, image recognition, and language processing. Additionally, you'll learn how to analyze and improve the performance of deep learning models. This can be done by comparing algorithms against benchmarks, along with machine intelligence, to learn from the information and determine ideal behaviors within a specific context. After finishing the book, you will be familiar with machine learning techniques, in particular the use of TensorFlow for deep learning, and will be ready to apply your knowledge to research or commercial projects. Style and approach This step-by-step guide will explore common, and not so common, deep neural networks and show how these can be exploited in the real world with complex raw data. With the help of practical examples, you will learn how to implement different types of neural nets to build smart applications related to text, speech, and image data processing. Summary Deep learning has transformed the fields of computer vision, image processing, and natural language applications. Thanks to TensorFlow.js, now JavaScript developers can build deep learning apps without relying on Python or R. Deep Learning with JavaScript shows developers how they can bring DL technology to the web. Written by the main authors of the TensorFlow library, this new book provides fascinating use cases and in-depth instruction for deep learning apps in JavaScript in your browser or on Node. Foreword by Nikhil Thorat and Daniel Smilkov. About the technology Running deep learning applications in the browser or on Node-based backends opens up exciting possibilities for smart web applications. With the TensorFlow.js library, you build and train deep learning models with JavaScript. Offering uncompromising production-quality scalability, modularity, and responsiveness, TensorFlow.js really shines for its portability. Its models run anywhere JavaScript runs, pushing ML farther up the application stack. About the book In Deep Learning with JavaScript, you'll learn to use TensorFlow.js to build deep learning models that run directly in the browser. This fast-paced book, written by Google engineers, is practical, engaging, and easy to follow. Through diverse examples featuring text analysis, speech processing, image recognition, and self-learning game AI, you'll master all the basics of deep learning and explore advanced concepts, like retraining existing models for transfer learning and image generation. What's inside - Image and language processing in the browser - Tuning ML models with client-side data - Text and image creation with generative deep learning - Source code samples to test and modify About the reader For JavaScript programmers interested in deep learning. About the author Shangting Cai, Stanley Bileschi and Eric D. Nielsen are software engineers with experience on the Google Brain team, and were crucial to the development of the high-level API of TensorFlow.js. This book is based in part on the classic, Deep Learning with Python by François Chollet. TOC: PART 1 - MOTIVATION AND BASIC CONCEPTS 1 • Deep learning and JavaScript PART 2 - A GENTLE INTRODUCTION TO TENSORFLOW.JS 2 • Getting started: Simple linear regression in TensorFlow.js 3 • Adding nonlinearity: Beyond weighted sums 4 • Recognizing images and sounds using convnets 5 • Transfer learning: Reusing pretrained neural networks PART 3 - ADVANCED DEEP LEARNING WITH TENSORFLOW.JS 6 • Working with data 7 • Visualizing data and models 8 • Underfitting, overfitting, and the universal workflow of machine learning 9 • Deep learning for sequences and text 10 • Generative deep learning 11 • Basics of deep reinforcement learning PART 4 - SUMMARY AND CLOSING WORDS 12 • Testing, optimizing, and deploying models 13 • Summary, conclusions, and beyond Get started with MATLAB for deep learning and AI with this in-depth primer. In this book, you start with machine learning fundamentals, then move on to neural networks, deep learning, and then convolutional neural networks. In a blend of fundamentals and applications, MATLAB Deep Learning employs MATLAB as the underlying programming language and tool for the

examples and case studies in this book. With this book, you'll be able to tackle some of today's real world big data, smart bots, and other complex data problems. You'll see how deep learning is a complex and more intelligent aspect of machine learning for modern smart data analysis and usage.

**What You'll Learn** Use MATLAB for deep learning Discover neural networks and multi-layer neural networks Work with convolution and pooling layers Build a MNIST example with these layers Who This Book Is For Those who want to learn deep learning using MATLAB. Some MATLAB experience may be useful. Build neural network models in text, vision and advanced analytics using PyTorch

**Key Features** Learn PyTorch for implementing cutting-edge deep learning algorithms. Train your neural networks for higher speed and flexibility and learn how to implement them in various scenarios; Cover various advanced neural network architecture such as ResNet, Inception, DenseNet and more with practical examples; Book Description Deep learning powers the most intelligent systems in the world, such as Google Voice, Siri, and Alexa. Advancements in powerful hardware, such as GPUs, software frameworks such as PyTorch, Keras, Tensorflow, and CNTK along with the availability of big data have made it easier to implement solutions to problems in the areas of text, vision, and advanced analytics. This book will get you up and running with one of the most cutting-edge deep learning libraries—PyTorch. PyTorch is grabbing the attention of deep learning researchers and data science professionals due to its accessibility, efficiency and being more native to Python way of development. You'll start off by installing PyTorch, then quickly move on to learn various fundamental blocks that power modern deep learning. You will also learn how to use CNN, RNN, LSTM and other networks to solve real-world problems. This book explains the concepts of various state-of-the-art deep learning architectures, such as ResNet, DenseNet, Inception, and Seq2Seq, without diving deep into the math behind them. You will also learn about GPU computing during the course of the book. You will see how to train a model with PyTorch and dive into complex neural networks such as generative networks for producing text and images. By the end of the book, you'll be able to implement deep learning applications in PyTorch with ease. What you will learn Use PyTorch for GPU-accelerated tensor computations Build custom datasets and data loaders for images and test the models using torchvision and torchtext Build an image classifier by implementing CNN architectures using PyTorch Build systems that do text classification and language modeling using RNN, LSTM, and GRU Learn advanced CNN architectures such as ResNet, Inception, Densenet, and learn how to use them for transfer learning Learn how to mix multiple models for a powerful ensemble model Generate new images using GAN's and generate artistic images using style transfer Who this book is for This book is for machine learning engineers, data analysts, data scientists interested in deep learning and are looking to explore implementing advanced algorithms in PyTorch. Some knowledge of machine learning is helpful but not a mandatory need. Working knowledge of Python programming is expected.

**Summary** Grokking Deep Learning teaches you to build deep learning neural networks from scratch! In his engaging style, seasoned deep learning expert Andrew Trask shows you the science under the hood, so you grok for yourself every detail of training neural networks. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications.

**About the Technology** Deep learning, a branch of artificial intelligence, teaches computers to learn by using neural networks, technology inspired by the human brain. Online text translation, self-driving cars, personalized product recommendations, and virtual voice assistants are just a few of the exciting modern advancements possible thanks to deep learning.

**About the Book** Grokking Deep Learning teaches you to build deep learning neural networks from scratch! In his engaging style, seasoned deep learning expert Andrew Trask shows you the science under the hood, so you grok for yourself every detail of training neural networks. Using only Python and its math-supporting library, NumPy, you'll train your own neural networks to see and understand images, translate text into different languages, and even write like Shakespeare! When you're done, you'll be fully prepared to move on to mastering deep learning frameworks. What's inside The science behind deep learning Building and training your own neural networks Privacy concepts, including federated learning Tips for continuing your pursuit of deep learning About the Reader For readers with high school-level math and intermediate programming skills.

**About the Author** Andrew Trask is a PhD student at Oxford University and a research scientist at DeepMind. Previously, Andrew was a researcher and analytics product manager at Digital Reasoning, where he trained the world's largest artificial neural network and helped guide the analytics roadmap for the Synthesys cognitive computing platform.

**Table of Contents** Introducing deep learning: why you should learn it Fundamental concepts: how do machines learn? Introduction to neural prediction: forward propagation Introduction to neural learning: gradient descent Learning multiple weights at a time: generalizing gradient descent Building your first deep neural network: introduction to backpropagation How to picture neural networks: in your head and on paper Learning signal and ignoring noise: introduction to regularization and batching Modeling probabilities and nonlinearities: activation functions Neural learning about edges and corners: intro to convolutional neural networks Neural networks that understand language: king - man + woman == ? Neural networks that write like Shakespeare: recurrent layers for variable-length data Introducing automatic optimization: let's build a deep learning framework Learning to write like Shakespeare: long short-term memory Deep learning on unseen data: introducing federated learning Where to go from here: a brief guide This book covers both classical and modern models in deep learning. The primary focus is on the theory and algorithms of deep learning. The theory and algorithms of neural networks are particularly important for understanding important concepts, so that one can understand the important design concepts of neural architectures in different applications. Why do neural networks work? When do they work better than off-the-shelf machine-learning models? When is depth useful? Why is training neural networks so hard? What are the pitfalls? The book is also rich in discussing different applications in order to give the practitioner a flavor of how neural architectures are designed for different types of problems. Applications associated with many different areas like recommender systems, machine translation, image captioning, image classification, reinforcement-learning based gaming, and text analytics are covered. The chapters of this book span three categories: The basics of neural networks: Many traditional machine learning models can be understood as special cases of neural networks. An emphasis is placed in the first two chapters on understanding the relationship between traditional machine learning and neural networks. Support vector machines, linear/logistic regression, singular value decomposition, matrix factorization, and recommender systems are shown to be special cases of neural networks. These methods are studied together with recent feature engineering methods like word2vec. Fundamentals of neural networks: A detailed discussion of training and regularization is provided in Chapters 3 and 4. Chapters 5 and 6 present radial-basis function (RBF) networks and restricted Boltzmann machines. Advanced topics in neural networks: Chapters 7 and 8 discuss recurrent neural networks and convolutional neural networks. Several advanced topics like deep reinforcement learning, neural Turing machines, Kohonen self-organizing maps, and generative adversarial networks are introduced in Chapters 9 and 10. The book is written for graduate students, researchers, and practitioners. Numerous exercises are available along with a solution manual to aid in classroom teaching. Where possible, an application-centric view is highlighted in order to provide an understanding of the practical uses of each class of techniques.

**Deep Learning with Keras** This book will introduce you to various supervised and unsupervised deep learning algorithms like the multilayer perceptron, linear regression and other more advanced deep convolutional and recurrent neural networks. You will also learn about image processing, handwritten recognition, object recognition and much more. Furthermore, you will get familiar with recurrent neural networks like LSTM and GAN as you explore processing sequence data like time series, text, and audio. The book will definitely be your best companion on this great deep learning journey with Keras introducing you to the basics you need to know in order to take next steps and learn more advanced deep

neural networks. Here Is a Preview of What You'll Learn Here... The difference between deep learning and machine learning Deep neural networks Convolutional neural networks Building deep learning models with Keras Multi-layer perceptron network models Activation functions Handwritten recognition using MNIST Solving multi-class classification problems Recurrent neural networks and sequence classification And much more... Get this book NOW and learn more about Deep Learning with Keras! Deep Learning with Structured Data teaches you powerful data analysis techniques for tabular data and relational databases. Summary Deep learning offers the potential to identify complex patterns and relationships hidden in data of all sorts. Deep Learning with Structured Data shows you how to apply powerful deep learning analysis techniques to the kind of structured, tabular data you'll find in the relational databases that real-world businesses depend on. Filled with practical, relevant applications, this book teaches you how deep learning can augment your existing machine learning and business intelligence systems. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology Here's a dirty secret: Half of the time in most data science projects is spent cleaning and preparing data. But there's a better way: Deep learning techniques optimized for tabular data and relational databases deliver insights and analysis without requiring intense feature engineering. Learn the skills to unlock deep learning performance with much less data filtering, validating, and scrubbing. About the book Deep Learning with Structured Data teaches you powerful data analysis techniques for tabular data and relational databases. Get started using a dataset based on the Toronto transit system. As you work through the book, you'll learn how easy it is to set up tabular data for deep learning, while solving crucial production concerns like deployment and performance monitoring. What's inside When and where to use deep learning The architecture of a Keras deep learning model Training, deploying, and maintaining models Measuring performance About the reader For readers with intermediate Python and machine learning skills. About the author Mark Ryan is a Data Science Manager at Intact Insurance. He holds a Master's degree in Computer Science from the University of Toronto. Table of Contents 1 Why deep learning with structured data? 2 Introduction to the example problem and Pandas dataframes 3 Preparing the data, part 1: Exploring and cleansing the data 4 Preparing the data, part 2: Transforming the data 5 Preparing and building the model 6 Training the model and running experiments 7 More experiments with the trained model 8 Deploying the model 9 Recommended next steps Get to grips with the basics of Keras to implement fast and efficient deep-learning models About This Book Implement various deep-learning algorithms in Keras and see how deep-learning can be used in games See how various deep-learning models and practical use-cases can be implemented using Keras A practical, hands-on guide with real-world examples to give you a strong foundation in Keras Who This Book Is For If you are a data scientist with experience in machine learning or an AI programmer with some exposure to neural networks, you will find this book a useful entry point to deep-learning with Keras. A knowledge of Python is required for this book. What You Will Learn Optimize step-by-step functions on a large neural network using the Backpropagation Algorithm Fine-tune a neural network to improve the quality of results Use deep learning for image and audio processing Use Recursive Neural Tensor Networks (RNTNs) to outperform standard word embedding in special cases Identify problems for which Recurrent Neural Network (RNN) solutions are suitable Explore the process required to implement Autoencoders Evolve a deep neural network using reinforcement learning In Detail This book starts by introducing you to supervised learning algorithms such as simple linear regression, the classical multilayer perceptron and more sophisticated deep convolutional networks. You will also explore image processing with recognition of hand written digit images, classification of images into different categories, and advanced objects recognition with related image annotations. An example of identification of salient points for face detection is also provided. Next you will be introduced to Recurrent Networks, which are optimized for processing sequence data such as text, audio or time series. Following that, you will learn about unsupervised learning algorithms such as Autoencoders and the very popular Generative Adversarial Networks (GAN). You will also explore non-traditional uses of neural networks as Style Transfer. Finally, you will look at Reinforcement Learning and its application to AI game playing, another popular direction of research and application of neural networks. Style and approach This book is an easy-to-follow guide full of examples and real-world applications to help you gain an in-depth understanding of Keras. This book will showcase more than twenty working Deep Neural Networks coded in Python using Keras. Grokking Artificial Intelligence Algorithms is a fully-illustrated and interactive tutorial guide to the different approaches and algorithms that underpin AI. Written in simple language and with lots of visual references and hands-on examples, you'll learn the concepts, terminology, and theory you need to effectively incorporate AI algorithms into your applications. Summary Grokking Artificial Intelligence Algorithms is a fully-illustrated and interactive tutorial guide to the different approaches and algorithms that underpin AI. Written in simple language and with lots of visual references and hands-on examples, you'll learn the concepts, terminology, and theory you need to effectively incorporate AI algorithms into your applications. And to make sure you truly grok as you go, you'll use each algorithm in practice with creative coding exercises—including building a maze puzzle game, performing diamond data analysis, and even exploring drone material optimization. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology Artificial intelligence touches every part of our lives. It powers our shopping and TV recommendations; it informs our medical diagnoses. Embracing this new world means mastering the core algorithms at the heart of AI. About the book Grokking Artificial Intelligence Algorithms uses illustrations, exercises, and jargon-free explanations to teach fundamental AI concepts. All you need is the algebra you remember from high school math class. Explore coding challenges like detecting bank fraud, creating artistic masterpieces, and setting a self-driving car in motion. What's inside Use cases for different AI algorithms Intelligent search for decision making Biologically inspired algorithms Machine learning and neural networks Reinforcement learning to build a better robot About the reader For software developers with high school-level algebra and calculus skills. About the author Rishal Hurbans is a technologist, startup and AI group founder, and international speaker. Table of Contents 1 Intuition of artificial intelligence 2 Search fundamentals 3 Intelligent search 4 Evolutionary algorithms 5 Advanced evolutionary approaches 6 Swarm intelligence: Ants 7 Swarm intelligence: Particles 8 Machine learning 9 Artificial neural networks 10 Reinforcement learning with Q-learning About the book: In Computer Sciences there is currently a gold rush mood due to a new field called "Deep Learning". But what is Deep Learning? This book is an introduction to Neural Networks and the most important Deep Learning model - the Convolutional Neural Network model including a description of tricks that can be used to train such models more quickly. We start with the biological role model: the Neuron. About 86.000.000.000 of these simple processing elements are in your brain! And they all work in parallel! We discuss how to model the operation of a biological neuron with technical neuron models and then consider the first simple single-layer network of technical neurons. We then introduce the Multi-Layer Perceptron (MLP) and the Convolutional Neural Network (CNN) model which uses the MLP at its end. At the end of the book we discuss promising new directions for the field of Deep Learning. A famous physicist once said: "What I cannot create, I do not understand". For this, the book is full of examples of how to program all models discussed in Python and TensorFlow - Today, the most important Deep Learning library. About the author: Prof. Dr.-Ing. Juergen Brauer is a professor for Sensor Data Processing and Programming at the University of Applied Sciences Kempten in Germany where he holds a "Deep Learning" and other machine learning related lectures for Computer Science and Advanced Driver Assistance Systems students. His personal experience tells him: "What I cannot program, I do not understand". Discover ways to implement various deep learning algorithms by leveraging Python and other technologies Key Features Learn deep learning models

through several activities. Begin with simple machine learning problems, and finish by building a complex system of your own. Teach your machines to see by mastering the technologies required for image recognition.

**Book Description** Deep learning is rapidly becoming the most preferred way of solving data problems. This is thanks, in part, to its huge variety of mathematical algorithms and their ability to find patterns that are otherwise invisible to us. *Deep Learning from the Basics* begins with a fast-paced introduction to deep learning with Python, its definition, characteristics, and applications. You'll learn how to use the Python interpreter and the script files in your applications, and utilize NumPy and Matplotlib in your deep learning models. As you progress through the book, you'll discover backpropagation—an efficient way to calculate the gradients of weight parameters—and study multilayer perceptrons and their limitations, before, finally, implementing a three-layer neural network and calculating multidimensional arrays. By the end of the book, you'll have the knowledge to apply the relevant technologies in deep learning. What you will learn

- Use Python with minimum external sources to implement deep learning programs
- Study the various deep learning and neural network theories
- Learn how to determine learning coefficients and the initial values of weights
- Implement trends such as Batch Normalization, Dropout, and Adam
- Explore applications like automatic driving, image generation, and reinforcement learning

**Who this book is for** *Deep Learning from the Basics* is designed for data scientists, data analysts, and developers who want to use deep learning techniques to develop efficient solutions. This book is ideal for those who want a deeper understanding as well as an overview of the technologies. Some working knowledge of Python is a must. Knowledge of NumPy and pandas will be beneficial, but not essential. 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

*Deep Learning with R* introduces deep learning and neural networks using the R programming language. The book builds on the understanding of the theoretical and mathematical constructs and enables the reader to create applications on computer vision, natural language processing and transfer learning. The book starts with an introduction to machine learning and moves on to describe the basic architecture, different activation functions, forward propagation, cross-entropy loss and backward propagation of a simple neural network. It goes on to create different code segments to construct deep neural networks. It discusses in detail the initialization of network parameters, optimization techniques, and some of the common issues surrounding neural networks such as dealing with NaNs and the vanishing/exploding gradient problem. Advanced variants of multilayered perceptrons namely, convolutional neural networks and sequence models are explained, followed by application to different use cases. The book makes extensive use of the Keras and TensorFlow frameworks. An accessible introduction to the artificial intelligence technology that enables computer vision, speech recognition, machine translation, and driverless cars. Deep learning is an artificial intelligence technology that enables computer vision, speech recognition in mobile phones, machine translation, AI games, driverless cars, and other applications. When we use consumer products from Google, Microsoft, Facebook, Apple, or Baidu, we are often interacting with a deep learning system. In this volume in the MIT Press Essential Knowledge series, computer scientist John Kelleher offers an accessible and concise but comprehensive introduction to the fundamental technology at the heart of the artificial intelligence revolution. Kelleher explains that deep learning enables data-driven decisions by identifying and extracting patterns from large datasets; its ability to learn from complex data makes deep learning ideally suited to take advantage of the rapid growth in big data and computational power. Kelleher also explains some of the basic concepts in deep learning, presents a history of advances in the field, and discusses the current state of the art. He describes the most important deep learning architectures, including autoencoders, recurrent neural networks, and long short-term networks, as well as such recent developments as Generative Adversarial Networks and capsule networks. He also provides a comprehensive (and comprehensible) introduction to the two fundamental algorithms in deep learning: gradient descent and backpropagation. Finally, Kelleher considers the future of deep learning—major trends, possible developments, and significant challenges. This book covers a large set of methods in the field of Artificial Intelligence - Deep Learning applied to real-world problems. The fundamentals of the Deep Learning approach and different types of Deep Neural Networks (DNNs) are first summarized in this book, which offers a comprehensive preamble for further problem-oriented chapters. The most interesting and open problems of machine learning in the framework of Deep Learning are discussed in this book and solutions are proposed. This book illustrates how to implement the zero-shot learning with Deep Neural Network Classifiers, which require a large amount of training data. The lack of annotated training data naturally pushes the researchers to implement low supervision algorithms. Metric learning is a long-term research but in the framework of Deep Learning approaches, it gets freshness and originality. Fine-grained classification with a low inter-class variability is a difficult problem for any classification tasks. This book presents how it is solved, by using different modalities and attention mechanisms in 3D convolutional networks. Researchers focused on Machine Learning, Deep learning, Multimedia and Computer Vision will want to buy this book. Advanced level students studying computer science within these topic areas will also find this book useful. This book systematically introduces readers to the theory of deep learning and explores its practical applications based on the MindSpore AI computing framework. Divided into 14 chapters, the book covers deep learning, deep neural networks (DNNs), convolutional neural networks (CNNs), recurrent neural networks (RNNs), unsupervised learning, deep reinforcement learning, automated machine learning, device-cloud collaboration, deep learning visualization, and data preparation for deep learning. To help clarify the complex topics discussed, this book includes numerous examples and links to online resources.

**Summary** *Deep Learning and the Game of Go* teaches you how to apply the power of deep learning to complex reasoning tasks by building a Go-playing AI. After exposing you to the foundations of machine and deep learning, you'll use Python to build a bot and then teach it the rules of the game. Foreword by Thore Graepel, DeepMind

**Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications.** About the Technology The ancient strategy game of Go is an incredible case study for AI. In 2016, a deep learning-based system shocked the Go world by defeating a world champion. Shortly after that, the upgraded AlphaGo Zero crushed the original bot by using deep reinforcement learning to master the game. Now, you can learn those same deep learning techniques by building your own Go bot! About the Book *Deep Learning and the Game of Go* introduces deep learning by teaching you to build a Go-winning bot. As you progress, you'll apply increasingly complex training techniques and strategies using the Python deep learning library Keras. You'll enjoy watching your bot master the game of Go, and along the way, you'll discover how to apply your new deep learning skills to a wide range of other scenarios! What's inside Build and teach a self-improving game AI Enhance classical game AI systems with deep learning Implement neural networks for deep learning About the Reader All you need are

basic Python skills and high school-level math. No deep learning experience required. About the Author Max Pumperla and Kevin Ferguson are experienced deep learning specialists skilled in distributed systems and data science. Together, Max and Kevin built the open source bot BetaGo.

Table of Contents PART 1 - FOUNDATIONS Toward deep learning: a machine-learning introduction Go as a machine-learning problem Implementing your first Go bot PART 2 - MACHINE LEARNING AND GAME AI Playing games with tree search Getting started with neural networks Designing a neural network for Go data Learning from data: a deep-learning bot Deploying bots in the wild Learning by practice: reinforcement learning Reinforcement learning with policy gradients Reinforcement learning with value methods Reinforcement learning with actor-critic methods PART 3 - GREATER THAN THE SUM OF ITS PARTS AlphaGo: Bringing it all together AlphaGo Zero: Integrating tree search with reinforcement learning "The authors' clear visual style provides a comprehensive look at what's currently possible with artificial neural networks as well as a glimpse of the magic that's to come." –Tim Urban, author of Wait But Why Fully Practical, Insightful Guide to Modern Deep Learning Deep learning is transforming software, facilitating powerful new artificial intelligence capabilities, and driving unprecedented algorithm performance. Deep Learning Illustrated is uniquely intuitive and offers a complete introduction to the discipline's techniques. Packed with full-color figures and easy-to-follow code, it sweeps away the complexity of building deep learning models, making the subject approachable and fun to learn. World-class instructor and practitioner Jon Krohn—with visionary content from Grant Beyleveld and beautiful illustrations by Aglaé Bassens—presents straightforward analogies to explain what deep learning is, why it has become so popular, and how it relates to other machine learning approaches. Krohn has created a practical reference and tutorial for developers, data scientists, researchers, analysts, and students who want to start applying it. He illuminates theory with hands-on Python code in accompanying Jupyter notebooks. To help you progress quickly, he focuses on the versatile deep learning library Keras to nimbly construct efficient TensorFlow models; PyTorch, the leading alternative library, is also covered. You'll gain a pragmatic understanding of all major deep learning approaches and their uses in applications ranging from machine vision and natural language processing to image generation and game-playing algorithms. Discover what makes deep learning systems unique, and the implications for practitioners Explore new tools that make deep learning models easier to build, use, and improve Master essential theory: artificial neurons, training, optimization, convolutional nets, recurrent nets, generative adversarial networks (GANs), deep reinforcement learning, and more Walk through building interactive deep learning applications, and move forward with your own artificial intelligence projects Register your book for convenient access to downloads, updates, and/or corrections as they become available. See inside book for details. A comprehensive text on foundations and techniques of graph neural networks with applications in NLP, data mining, vision and healthcare. Gain expertise in advanced deep learning domains such as neural networks, meta-learning, graph neural networks, and memory augmented neural networks using the Python ecosystem Key Features Get to grips with building faster and more robust deep learning architectures Investigate and train convolutional neural network (CNN) models with GPU-accelerated libraries such as TensorFlow and PyTorch Apply deep neural networks (DNNs) to computer vision problems, NLP, and GANs Book Description In order to build robust deep learning systems, you'll need to understand everything from how neural networks work to training CNN models. In this book, you'll discover newly developed deep learning models, methodologies used in the domain, and their implementation based on areas of application. You'll start by understanding the building blocks and the math behind neural networks, and then move on to CNNs and their advanced applications in computer vision. You'll also learn to apply the most popular CNN architectures in object detection and image segmentation. Further on, you'll focus on variational autoencoders and GANs. You'll then use neural networks to extract sophisticated vector representations of words, before going on to cover various types of recurrent networks, such as LSTM and GRU. You'll even explore the attention mechanism to process sequential data without the help of recurrent neural networks (RNNs). Later, you'll use graph neural networks for processing structured data, along with covering meta-learning, which allows you to train neural networks with fewer training samples. Finally, you'll understand how to apply deep learning to autonomous vehicles. By the end of this book, you'll have mastered key deep learning concepts and the different applications of deep learning models in the real world. What you will learn Cover advanced and state-of-the-art neural network architectures Understand the theory and math behind neural networks Train DNNs and apply them to modern deep learning problems Use CNNs for object detection and image segmentation Implement generative adversarial networks (GANs) and variational autoencoders to generate new images Solve natural language processing (NLP) tasks, such as machine translation, using sequence-to-sequence models Understand DL techniques, such as meta-learning and graph neural networks Who this book is for This book is for data scientists, deep learning engineers and researchers, and AI developers who want to further their knowledge of deep learning and build innovative and unique deep learning projects. Anyone looking to get to grips with advanced use cases and methodologies adopted in the deep learning domain using real-world examples will also find this book useful. Basic understanding of deep learning concepts and working knowledge of the Python programming language is assumed. Summary Deep Learning with Python introduces the field of deep learning using the Python language and the powerful Keras library. Written by Keras creator and Google AI researcher François Chollet, this book builds your understanding through intuitive explanations and practical examples. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Machine learning has made remarkable progress in recent years. We went from near-unusable speech and image recognition, to near-human accuracy. We went from machines that couldn't beat a serious Go player, to defeating a world champion. Behind this progress is deep learning—a combination of engineering advances, best practices, and theory that enables a wealth of previously impossible smart applications. About the Book Deep Learning with Python introduces the field of deep learning using the Python language and the powerful Keras library. Written by Keras creator and Google AI researcher François Chollet, this book builds your understanding through intuitive explanations and practical examples. You'll explore challenging concepts and practice with applications in computer vision, natural-language processing, and generative models. By the time you finish, you'll have the knowledge and hands-on skills to apply deep learning in your own projects. What's Inside Deep learning from first principles Setting up your own deep-learning environment Image-classification models Deep learning for text and sequences Neural style transfer, text generation, and image generation About the Reader Readers need intermediate Python skills. No previous experience with Keras, TensorFlow, or machine learning is required. About the Author François Chollet works on deep learning at Google in Mountain View, CA. He is the creator of the Keras deep-learning library, as well as a contributor to the TensorFlow machine-learning framework. He also does deep-learning research, with a focus on computer vision and the application of machine learning to formal reasoning. His papers have been published at major conferences in the field, including the Conference on Computer Vision and Pattern Recognition (CVPR), the Conference and Workshop on Neural Information Processing Systems (NIPS), the International Conference on Learning Representations (ICLR), and others. Table of Contents PART 1 - FUNDAMENTALS OF DEEP LEARNING What is deep learning? Before we begin: the mathematical building blocks of neural networks Getting started with neural networks Fundamentals of machine learning PART 2 - DEEP LEARNING IN PRACTICE Deep learning for computer vision Deep learning for text and sequences Advanced deep-learning best practices Generative deep learning Conclusions appendix A - Installing Keras and its dependencies on Ubuntu appendix B - Running Jupyter notebooks on an EC2 GPU instance With the resurgence of neural networks in the 2010s, deep learning has become essential for machine learning practitioners and even many software engineers. This

book provides a comprehensive introduction for data scientists and software engineers with machine learning experience. You'll start with deep learning basics and move quickly to the details of important advanced architectures, implementing everything from scratch along the way. Author Seth Weidman shows you how neural networks work using a first principles approach. You'll learn how to apply multilayer neural networks, convolutional neural networks, and recurrent neural networks from the ground up. With a thorough understanding of how neural networks work mathematically, computationally, and conceptually, you'll be set up for success on all future deep learning projects. This book provides: Extremely clear and thorough mental models—accompanied by working code examples and mathematical explanations—for understanding neural networks Methods for implementing multilayer neural networks from scratch, using an easy-to-understand object-oriented framework Working implementations and clear-cut explanations of convolutional and recurrent neural networks Implementation of these neural network concepts using the popular PyTorch framework Summary Deep Learning for Search teaches you how to improve the effectiveness of your search by implementing neural network-based techniques. By the time you're finished with the book, you'll be ready to build amazing search engines that deliver the results your users need and that get better as time goes on! Foreword by Chris Mattmann. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Deep learning handles the toughest search challenges, including imprecise search terms, badly indexed data, and retrieving images with minimal metadata. And with modern tools like DL4J and TensorFlow, you can apply powerful DL techniques without a deep background in data science or natural language processing (NLP). This book will show you how. About the Book Deep Learning for Search teaches you to improve your search results with neural networks. You'll review how DL relates to search basics like indexing and ranking. Then, you'll walk through in-depth examples to upgrade your search with DL techniques using Apache Lucene and Deeplearning4j. As the book progresses, you'll explore advanced topics like searching through images, translating user queries, and designing search engines that improve as they learn! What's inside Accurate and relevant rankings Searching across languages Content-based image search Search with recommendations About the Reader For developers comfortable with Java or a similar language and search basics. No experience with deep learning or NLP needed. About the Author Tommaso Teofili is a software engineer with a passion for open source and machine learning. As a member of the Apache Software Foundation, he contributes to a number of open source projects, ranging from topics like information retrieval (such as Lucene and Solr) to natural language processing and machine translation (including OpenNLP, Joshua, and UIMA). He currently works at Adobe, developing search and indexing infrastructure components, and researching the areas of natural language processing, information retrieval, and deep learning. He has presented search and machine learning talks at conferences including BerlinBuzzwords, International Conference on Computational Science, ApacheCon, EclipseCon, and others. You can find him on Twitter at @tteofili. Table of Contents PART 1 - SEARCH MEETS DEEP LEARNING Neural search Generating synonyms PART 2 - THROWING NEURAL NETS AT A SEARCH ENGINE From plain retrieval to text generation More-sensitive query suggestions Ranking search results with word embeddings Document embeddings for rankings and recommendations PART 3 - ONE STEP BEYOND Searching across languages Content-based image search A peek at performance 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 An introduction to a broad range of topics in deep learning, covering mathematical and conceptual background, deep learning techniques used in industry, and research perspectives. “Written by three experts in the field, Deep Learning is the only comprehensive book on the subject.” —Elon Musk, cochair of OpenAI; cofounder and CEO of Tesla and SpaceX Deep learning is a form of machine learning that enables computers to learn from experience and understand the world in terms of a hierarchy of concepts. Because the computer gathers knowledge from experience, there is no need for a human computer operator to formally specify all the knowledge that the computer needs. The hierarchy of concepts allows the computer to learn complicated concepts by building them out of simpler ones; a graph of these hierarchies would be many layers deep. This book introduces a broad range of topics in deep learning. The text offers mathematical and conceptual background, covering relevant concepts in linear algebra, probability theory and information theory, numerical computation, and machine learning. It describes deep learning techniques used by practitioners in industry, including deep feedforward networks, regularization, optimization algorithms, convolutional networks, sequence modeling, and practical methodology; and it surveys such applications as natural language processing, speech recognition, computer vision, online recommendation systems, bioinformatics, and videogames. Finally, the book offers research perspectives, covering such theoretical topics as linear factor models, autoencoders, representation learning, structured probabilistic models, Monte Carlo methods, the partition function, approximate inference, and deep generative models. Deep Learning can be used by undergraduate or graduate students planning careers in either industry or research, and by software engineers who want to begin using deep learning in their products or platforms. A website offers supplementary material for both readers and instructors. 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 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. Deep learning simplified by taking supervised, unsupervised, and reinforcement learning to the next level using the Python ecosystem

**Key Features** Build deep learning models with transfer learning principles in Python implement transfer learning to solve real-world research problems Perform complex operations such as image captioning neural style transfer

**Book Description** Transfer learning is a machine learning (ML) technique where knowledge gained during training a set of problems can be used to solve other similar problems. The purpose of this book is two-fold; firstly, we focus on detailed coverage of deep learning (DL) and transfer learning, comparing and contrasting the two with easy-to-follow concepts and examples. The second area of focus is real-world examples and research problems using TensorFlow, Keras, and the Python ecosystem with hands-on examples. The book starts with the key essential concepts of ML and DL, followed by depiction and coverage of important DL architectures such as convolutional neural networks (CNNs), deep neural networks (DNNs), recurrent neural networks (RNNs), long short-term memory (LSTM), and capsule networks. Our focus then shifts to transfer learning concepts, such as model freezing, fine-tuning, pre-trained models including VGG, inception, ResNet, and how these systems perform better than DL models with practical examples. In the concluding chapters, we will focus on a multitude of real-world case studies and problems associated with areas such as computer vision, audio analysis and natural language processing (NLP). By the end of this book, you will be able to implement both DL and transfer learning principles in your own systems. What you will learn

**Set up your own DL environment** with graphics processing unit (GPU) and Cloud support Delve into transfer learning principles with ML and DL models Explore various DL architectures, including CNN, LSTM, and capsule networks Learn about data and network representation and loss functions Get to grips with models and strategies in transfer learning Walk through potential challenges in building complex transfer learning models from scratch Explore real-world research problems related to computer vision and audio analysis Understand how transfer learning can be leveraged in NLP

**Who this book is for** Hands-On Transfer Learning with Python is for data scientists, machine learning engineers, analysts and developers with an interest in data and applying state-of-the-art transfer learning methodologies to solve tough real-world problems. Basic proficiency in machine learning and Python is required. “We finally have the definitive treatise on PyTorch! It covers the basics and abstractions in great detail. I hope this book becomes your extended reference document.” —Soumith Chintala, co-creator of PyTorch

**Key Features** Written by PyTorch’s creator and key contributors Develop deep learning models in a familiar Pythonic way Use PyTorch to build an image classifier for cancer detection Diagnose problems with your neural network and improve training with data augmentation

**Purchase of the print book** includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About The Book 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. Instantly familiar to anyone who knows Python data tools like NumPy and Scikit-learn, PyTorch simplifies deep learning without sacrificing advanced features. It’s great for building quick models, and it scales smoothly from laptop to enterprise. Deep Learning with PyTorch teaches you to create deep learning and neural network systems with PyTorch. This practical book gets you to work right away building a tumor image classifier from scratch. After covering the basics, you’ll learn best practices for the entire deep learning pipeline, tackling advanced projects as your PyTorch skills become more sophisticated. All code samples are easy to explore in downloadable Jupyter notebooks. What You Will Learn

**Understanding deep learning** data structures such as tensors and neural networks Best practices for the PyTorch Tensor API, loading data in Python, and visualizing results Implementing modules and loss functions Utilizing pretrained models from PyTorch Hub Methods for training networks with limited inputs Sifting through unreliable results to diagnose and fix problems in your neural network Improve your results with augmented data, better model architecture, and fine tuning

**This Book Is Written For** For Python programmers with an interest in machine learning. No experience with PyTorch or other deep learning frameworks is required. About The Authors Eli Stevens has worked in Silicon Valley for the past 15 years as a software engineer, and the past 7 years as Chief Technical Officer of a startup making medical device software. Luca Antiga is co-founder and CEO of an AI engineering company located in Bergamo, Italy, and a regular contributor to PyTorch. Thomas Viehmann is a Machine Learning and PyTorch speciality trainer and consultant based in Munich, Germany and a PyTorch core developer.

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Work with advanced topics in deep learning, such as optimization algorithms, hyper-parameter tuning, dropout, and error analysis as well as strategies to address typical problems encountered when training deep neural networks. You’ll begin by studying the activation functions mostly with a single neuron (ReLU, sigmoid, and Swish), seeing how to perform linear and logistic regression using TensorFlow, and choosing the right cost function. The next section talks about more complicated neural network architectures with several layers and neurons and explores the problem of random initialization of weights. An entire chapter is dedicated to a complete overview of neural network error analysis, giving examples of solving problems originating from variance, bias, overfitting, and datasets coming from different distributions. Applied Deep Learning also discusses how to implement logistic regression completely from scratch without using any Python library except NumPy, to let you appreciate how libraries such as TensorFlow allow quick and efficient experiments. Case studies for each method are included to put into practice all theoretical information. You’ll discover tips and tricks for writing optimized Python code (for example vectorizing loops with NumPy). What You Will Learn

**Implement advanced techniques** in the right way in Python and TensorFlow Debug and optimize advanced methods (such as dropout and regularization) Carry out error analysis (to realize if one has a bias problem, a variance problem, a data offset problem, and so on) Set up a machine learning project focused on deep learning on a complex dataset

**Who This Book Is For** Readers with a medium understanding of machine learning, linear algebra, calculus, and basic Python programming. 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. Discover best practices for choosing, building, training, and improving deep learning models using Keras-R, and TensorFlow-R libraries

**Key Features**

- Implement deep learning algorithms to build AI models with the help of tips and tricks
- Understand how deep learning models operate using expert techniques
- Apply reinforcement learning, computer vision, GANs, and NLP using a range of datasets

**Book Description**

Deep learning is a branch of machine learning based on a set of algorithms that attempt to model high-level abstractions in data. *Advanced Deep Learning with R* will help you understand popular deep learning architectures and their variants in R, along with providing real-life examples for them. This deep learning book starts by covering the essential deep learning techniques and concepts for prediction and classification. You will learn about neural networks, deep learning architectures, and the fundamentals for implementing deep learning with R. The book will also take you through using important deep learning libraries such as Keras-R and TensorFlow-R to implement deep learning algorithms within applications. You will get up to speed with artificial neural networks, recurrent neural networks, convolutional neural networks, long short-term memory networks, and more using advanced examples. Later, you'll discover how to apply generative adversarial networks (GANs) to generate new images; autoencoder neural networks for image dimension reduction, image de-noising and image correction and transfer learning to prepare, define, train, and model a deep neural network. By the end of this book, you will be ready to implement your knowledge and newly acquired skills for applying deep learning algorithms in R through real-world examples. What you will learn

- Learn how to create binary and multi-class deep neural network models
- Implement GANs for generating new images
- Create autoencoder neural networks for image dimension reduction, image de-noising and image correction
- Implement deep neural networks for performing efficient text classification
- Learn to define a recurrent convolutional network model for classification in Keras

Explore best practices and tips for performance optimization of various deep learning models

Who this book is for: This book is for data scientists, machine learning practitioners, deep learning researchers and AI enthusiasts who want to develop their skills and knowledge to implement deep learning techniques and algorithms using the power of R. A solid understanding of machine learning and working knowledge of the R programming language are required. Deploy deep learning solutions in production with ease using TensorFlow. You'll also develop the mathematical understanding and intuition required to invent new deep learning architectures and solutions on your own. *Pro Deep Learning with TensorFlow* provides practical, hands-on expertise so you can learn deep learning from scratch and deploy meaningful deep learning solutions. This book will allow you to get up to speed quickly using TensorFlow and to optimize different deep learning architectures. All of the practical aspects of deep learning that are relevant in any industry are emphasized in this book. You will be able to use the prototypes demonstrated to build new deep learning applications. The code presented in the book is available in the form of iPython notebooks and scripts which allow you to try out examples and extend them in interesting ways. You will be equipped with the mathematical foundation and scientific knowledge to pursue research in this field and give back to the community. What You'll Learn

- Understand full stack deep learning using TensorFlow and gain a solid mathematical foundation for deep learning
- Deploy complex deep learning solutions in production using TensorFlow
- Carry out research on deep learning and perform experiments using TensorFlow

Who This Book Is For: Data scientists and machine learning professionals, software developers, graduate students, and open source enthusiasts

Discover how to leverage Keras, the powerful and easy-to-use open source Python library for developing and evaluating deep learning models

**Key Features\***

- Get to grips with various model evaluation metrics, including sensitivity, specificity, and AUC scores\*
- Explore advanced concepts such as sequential memory and sequential modeling\*
- Reinforce your skills with real-world development, screencasts, and knowledge checks

**Book Description**

New experiences can be intimidating, but not this one! This beginner's guide to deep learning is here to help you explore deep learning from scratch with Keras, and be on your way to training your first ever neural networks. What sets Keras apart from other deep learning frameworks is its simplicity. With over two hundred thousand users, Keras has a stronger adoption in industry and the research community than any other deep learning framework. The *Deep Learning with Keras Workshop* starts by introducing you to the fundamental concepts of machine learning using the scikit-learn package. After learning how to perform the linear transformations that are necessary for building neural networks, you'll build your first neural network with the Keras library. As you advance, you'll learn how to build multi-layer neural networks and recognize when your model is underfitting or overfitting to the training data. With the help of practical exercises, you'll learn to use cross-validation techniques to evaluate your models and then choose the optimal hyperparameters to fine-tune their performance. Finally, you'll explore recurrent neural networks and learn how to train them to predict values in sequential data. By the end of this book, you'll have developed the skills you need to confidently train your own neural network models. What you will learn\*

- Gain insights into the fundamentals of neural networks\*
- Understand the limitations of machine learning and how it differs from deep learning\*
- Build image classifiers with convolutional neural networks\*
- Evaluate, tweak, and improve your models with techniques such as cross-validation\*
- Create prediction models to detect data patterns and make predictions\*
- Improve model accuracy with L1, L2, and dropout regularization

Who this book is for: If you know the basics of data science and machine learning and want to get started with advanced machine learning technologies like artificial neural networks and deep learning, then this is the book for you. To grasp the concepts explained in this deep learning book more effectively, prior experience in Python programming and some familiarity with statistics and logistic regression are a must. How deep learning—from Google Translate to driverless cars to personal cognitive assistants—is changing our lives and transforming every sector of the economy. The deep learning revolution has brought us driverless cars, the greatly improved Google Translate, fluent conversations with Siri and Alexa, and enormous profits from automated trading on the New York Stock Exchange. Deep learning networks can play poker better than professional poker players and defeat a world champion at Go. In this book, Terry Sejnowski explains how deep learning went from being an arcane academic field to a disruptive technology in the information economy. Sejnowski played an important role in the founding of deep learning, as one of a small group of researchers in the 1980s who challenged the prevailing logic-and-symbol based version of AI. The new version of AI Sejnowski and others developed, which became deep learning, is fueled instead by data. Deep networks learn from data in the same way that babies experience the world, starting with fresh eyes and gradually acquiring the skills needed to navigate novel environments. Learning algorithms extract information from raw data; information can be used to create knowledge; knowledge underlies understanding; understanding leads to wisdom. Someday a driverless car will know the road better than you do and drive with more

skill; a deep learning network will diagnose your illness; a personal cognitive assistant will augment your puny human brain. It took nature many millions of years to evolve human intelligence; AI is on a trajectory measured in decades. Sejnowski prepares us for a deep learning future. Discover how to integrate KNIME Analytics Platform with deep learning libraries to implement artificial intelligence solutions

### Key Features

Become well-versed with KNIME Analytics Platform to perform codeless deep learning

### Design and build deep learning workflows quickly and more easily using the KNIME GUI

Discover different deployment options without using a single line of code with KNIME Analytics Platform

### Book Description

KNIME Analytics Platform is an open source software used to create and design data science workflows. This book is a comprehensive guide to the KNIME GUI and KNIME deep learning integration, helping you build neural network models without writing any code. It'll guide you in building simple and complex neural networks through practical and creative solutions for solving real-world data problems. Starting with an introduction to KNIME Analytics Platform, you'll get an overview of simple feed-forward networks for solving simple classification problems on relatively small datasets. You'll then move on to build, train, test, and deploy more complex networks, such as autoencoders, recurrent neural networks (RNNs), long short-term memory (LSTM), and convolutional neural networks (CNNs). In each chapter, depending on the network and use case, you'll learn how to prepare data, encode incoming data, and apply best practices. By the end of this book, you'll have learned how to design a variety of different neural architectures and will be able to train, test, and deploy the final network. What you will learn

- Use various common nodes to transform your data into the right structure suitable for training a neural network
- Understand neural network techniques such as loss functions, backpropagation, and hyperparameters
- Prepare and encode data appropriately to feed it into the network
- Build and train a classic feedforward network
- Develop and optimize an autoencoder network for outlier detection
- Implement deep learning networks such as CNNs, RNNs, and LSTM with the help of practical examples
- Deploy a trained deep learning network on real-world data

Who this book is for This book is for data analysts, data scientists, and deep learning developers who are not well-versed in Python but want to learn how to use KNIME GUI to build, train, test, and deploy neural networks with different architectures. The practical implementations shown in the book do not require coding or any knowledge of dedicated scripts, so you can easily implement your knowledge into practical applications. No prior experience of using KNIME is required to get started with this book. Deep learning is often viewed as the exclusive domain of math PhDs and big tech companies. But as this hands-on guide demonstrates, programmers comfortable with Python can achieve impressive results in deep learning with little math background, small amounts of data, and minimal code. How? With fastai, the first library to provide a consistent interface to the most frequently used deep learning applications. Authors Jeremy Howard and Sylvain Gugger, the creators of fastai, show you how to train a model on a wide range of tasks using fastai and PyTorch. You'll also dive progressively further into deep learning theory to gain a complete understanding of the algorithms behind the scenes. Train models in computer vision, natural language processing, tabular data, and collaborative filtering

### Learn the latest deep learning techniques that matter most in practice

Improve accuracy, speed, and reliability by understanding how deep learning models work

### Discover how to turn your models into web applications

Implement deep learning algorithms from scratch

### Consider the ethical implications of your work

Gain insight from the foreword by PyTorch cofounder, Soumith Chintala

### NVIDIA's Full-Color Guide to Deep Learning: All Students Need to Get Started and Get Results

Learning Deep Learning is a complete guide to DL. Illuminating both the core concepts and the hands-on programming techniques needed to succeed, this book suits seasoned developers, data scientists, analysts, but also those with no prior machine learning or statistic experience. After introducing the essential building blocks of deep neural networks, such as artificial neurons and fully connected, convolutional, and recurrent layers, Magnus Ekman shows how to use them to build advanced architectures, including the Transformer. He describes how these concepts are used to build modern networks for computer vision and natural language processing (NLP), including Mask R-CNN, GPT, and BERT. And he explains how a natural language translator and a system generating natural language descriptions of images. Throughout, Ekman provides concise, well-annotated code examples using TensorFlow with Keras. Corresponding PyTorch examples are provided online, and the book thereby covers the two dominating Python libraries for DL used in industry and academia. He concludes with an introduction to neural architecture search (NAS), exploring important ethical issues and providing resources for further learning.

### Explore and master core concepts: perceptrons, gradient-based learning, sigmoid neurons, and back propagation

See how DL frameworks make it easier to develop more complicated and useful neural networks

### Discover how convolutional neural networks (CNNs) revolutionize image classification and analysis

Apply recurrent neural networks (RNNs) and long short-term memory (LSTM) to text and other variable-length sequences

### Master NLP with sequence-to-sequence networks and the Transformer architecture

Build applications for natural language translation and image captioning

### Introduction to Deep Learning and Neural Networks with Python™: A Practical Guide

is an intensive step-by-step guide for neuroscientists to fully understand, practice, and build neural networks. Providing math and Python™ code examples to clarify neural network calculations, by book's end readers will fully understand how neural networks work starting from the simplest model  $Y=X$  and building from scratch. Details and explanations are provided on how a generic gradient descent algorithm works based on mathematical and Python™ examples, teaching you how to use the gradient descent algorithm to manually perform all calculations in both the forward and backward passes of training a neural network. Examines the practical side of deep learning and neural networks

### Provides a problem-based approach to building artificial neural networks using real data

Describes Python™ functions and features for neuroscientists

### Uses a careful tutorial approach to describe implementation of neural networks in Python™

Features math and code examples (via companion website) with helpful instructions for easy implementation

### Summary

Deep Learning with R introduces the world of deep learning using the powerful Keras library and its R language interface. The book builds your understanding of deep learning through intuitive explanations and practical examples. Continue your journey into the world of deep learning with Deep Learning with R in Motion, a practical, hands-on video course available exclusively at Manning.com ([www.manning.com/livevideo/deep-learning-with-r-in-motion](http://www.manning.com/livevideo/deep-learning-with-r-in-motion)). Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Machine learning has made remarkable progress in recent years. Deep-learning systems now enable previously impossible smart applications, revolutionizing image recognition and natural-language processing, and identifying complex patterns in data. The Keras deep-learning library provides data scientists and developers working in R a state-of-the-art toolset for tackling deep-learning tasks. About the Book Deep Learning with R introduces the world of deep learning using the powerful Keras library and its R language interface. Initially written for Python as Deep Learning with Python by Keras creator and Google AI researcher François Chollet and adapted for R by RStudio founder J. J. Allaire, this book builds your understanding of deep learning through intuitive explanations and practical examples. You'll practice your new skills with R-based applications in computer vision, natural-language processing, and generative models. What's Inside Deep learning from first principles

### Setting up your own deep-learning environment

Image classification and generation

### Deep learning for text and sequences

About the Reader You'll need intermediate R programming skills. No previous experience with machine learning or deep learning is assumed. About the Authors François Chollet is a deep-learning researcher at Google and the author of the Keras library. J.J. Allaire is the founder of RStudio and the author of the R interfaces to TensorFlow and Keras.

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