

Read Free Advanced Deep Learning With Keras Apply Deep Lear

Umberto Michelucci

[Hands-On Deep Learning Architectures with Python](#) Yuxi (Hayden) Liu, Saransh Mehta. 2019-04-30 Concepts, tools, and techniques to explore deep learning architectures and methodologies Key Features Explore advanced deep learning architectures using various datasets and frameworks Implement deep architectures for neural network models such as CNN, RNN, GAN, and many more Discover design patterns and different challenges for various deep learning architectures Book Description Deep learning architectures are composed of multilevel nonlinear operations that represent high-level abstractions; this allows you to learn useful feature representations from the data. This book will help you learn and implement deep learning architectures to resolve various deep learning research problems. Hands-On Deep Learning Architectures with Python explains the essential learning algorithms used for deep and shallow architectures. Packed with practical implementations and ideas to help you build efficient artificial intelligence systems (AI), this book will help you learn how neural networks play a major role in building deep architectures. You will understand various deep learning architectures (such as AlexNet, VGG Net, GoogleNet) with easy-to-follow code and diagrams. In addition to this, the book will also guide you in building and training various deep architectures such as the Boltzmann mechanism, autoencoders, convolutional neural networks (CNNs), recurrent neural networks (RNNs), natural language processing (NLP), GAN, and more—all with practical implementations. By the end of this book, you will be able to construct deep models using popular frameworks and datasets with the required design patterns for each architecture. You will be ready to explore the potential of deep architectures in today's world. What you will learn Implement CNNs, RNNs, and other commonly used architectures with Python Explore architectures such as VGGNet, AlexNet, and GoogLeNet Build deep learning architectures for AI applications such as face and image recognition, fraud detection, and many more Understand the architectures and applications of Boltzmann machines and autoencoders with concrete examples Master artificial intelligence and neural network concepts and apply them to your architecture Understand deep learning architectures for mobile and embedded systems Who this book is for If you're a data scientist, machine learning developer/engineer, or deep learning practitioner, or are curious about AI and want to upgrade your knowledge of various deep learning architectures, this book will appeal to

you. You are expected to have some knowledge of statistics and machine learning algorithms to get the best out of this book
Advanced Deep Learning with TensorFlow 2 and Keras Rowel Atienza.2020

Keras 2.x Projects Giuseppe Ciaburro.2018-12-31 Demonstrate fundamentals of Deep Learning and neural network methodologies using Keras 2.x Key Features Experimental projects showcasing the implementation of high-performance deep learning models with Keras. Use-cases across reinforcement learning, natural language processing, GANs and computer vision. Build strong fundamentals of Keras in the area of deep learning and artificial intelligence. Book Description Keras 2.x Projects explains how to leverage the power of Keras to build and train state-of-the-art deep learning models through a series of practical projects that look at a range of real-world application areas. To begin with, you will quickly set up a deep learning environment by installing the Keras library. Through each of the projects, you will explore and learn the advanced concepts of deep learning and will learn how to compute and run your deep learning models using the advanced offerings of Keras. You will train fully-connected multilayer networks, convolutional neural networks, recurrent neural networks, autoencoders and generative adversarial networks using real-world training datasets. The projects you will undertake are all based on real-world scenarios of all complexity levels, covering topics such as language recognition, stock volatility, energy consumption prediction, faster object classification for self-driving vehicles, and more. By the end of this book, you will be well versed with deep learning and its implementation with Keras. You will have all the knowledge you need to train your own deep learning models to solve different kinds of problems. What you will learn Apply regression methods to your data and understand how the regression algorithm works Understand the basic concepts of classification methods and how to implement them in the Keras environment Import and organize data for neural network classification analysis Learn about the role of rectified linear units in the Keras network architecture Implement a recurrent neural network to classify the sentiment of sentences from movie reviews Set the embedding layer and the tensor sizes of a network Who this book is for If you are a data scientist, machine learning engineer, deep learning practitioner or an AI engineer who wants to build speedy intelligent applications with minimal lines of codes, then this book is the best fit for you. Sound knowledge of machine learning and basic familiarity with Keras library would be useful.

Deep Learning with Keras Frank Millstein.2018-02-22 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!

Advanced Applied Deep Learning Umberto Michelucci.2019-09-28 Develop and optimize deep learning models with advanced architectures. This book teaches you the intricate details and subtleties of the algorithms that are at the core of convolutional neural networks. In *Advanced Applied Deep Learning*, you will study advanced topics on CNN and object detection using Keras and TensorFlow. Along the way, you will look at the fundamental operations in CNN, such as convolution and pooling, and then look at more advanced architectures such as inception networks, resnets, and many more. While the book discusses theoretical topics, you will discover how to work efficiently with Keras with many tricks and tips, including how to customize logging in Keras with custom callback classes, what is eager execution, and how to use it in your models. Finally, you will study how object detection works, and build a complete implementation of the YOLO (you only look once) algorithm in Keras and TensorFlow. By the end of the book you will have implemented various models in Keras and learned many advanced tricks that will bring your skills to the next level. What You Will Learn See how convolutional neural networks and object detection work Save weights and models on disk Pause training and restart it at a later stage Use hardware acceleration (GPUs) in your code Work with the Dataset TensorFlow abstraction and use pre-trained models and transfer learning Remove and add layers to pre-trained networks to adapt them to your specific project Apply pre-trained models such as Alexnet and VGG16 to new datasets Who This Book Is For Scientists and researchers with intermediate-to-advanced Python and machine learning know-how. Additionally, intermediate knowledge of Keras and TensorFlow is expected.

Introduction to Deep Learning Eugene Charniak.2019-01-29 A project-based guide to the basics of deep learning. This concise, project-driven guide to deep learning takes readers through a series of program-writing tasks that introduce them to the use of deep learning in such areas of artificial intelligence as computer vision, natural-language processing, and reinforcement learning. The author, a longtime artificial intelligence researcher specializing in natural-language processing, covers feed-forward neural nets, convolutional neural nets, word embeddings, recurrent neural nets, sequence-to-sequence learning, deep reinforcement learning, unsupervised models, and other fundamental concepts and techniques. Students and practitioners learn the basics of deep learning by working through programs in Tensorflow, an open-source machine learning framework. "I find I learn computer science material best by sitting down and writing programs," the author writes, and the book reflects this approach. Each chapter includes a programming project, exercises, and references for further reading. An early chapter is devoted to Tensorflow and its interface with Python, the widely used programming language. Familiarity with

linear algebra, multivariate calculus, and probability and statistics is required, as is a rudimentary knowledge of programming in Python. The book can be used in both undergraduate and graduate courses; practitioners will find it an essential reference.

Advanced Deep Learning with Keras Rowel Atienza.2018-10-31 A comprehensive guide to advanced deep learning techniques, including Autoencoders, GANs, VAEs, and Deep Reinforcement Learning, that drive today's most impressive AI results Key FeaturesExplore the most advanced deep learning techniques that drive modern AI resultsImplement Deep Neural Networks, Autoencoders, GANs, VAEs, and Deep Reinforcement LearningA wide study of GANs, including Improved GANs, Cross-Domain GANs and Disentangled Representation GANsBook Description Recent developments in deep learning, including GANs, Variational Autoencoders, and Deep Reinforcement Learning, are creating impressive AI results in our news headlines - such as AlphaGo Zero beating world chess champions, and generative AI that can create art paintings that sell for over \$400k because they are so human-like. Advanced Deep Learning with Keras is a comprehensive guide to the advanced deep learning techniques available today, so you can create your own cutting-edge AI. Using Keras as an open-source deep learning library, you'll find hands-on projects throughout that show you how to create more effective AI with the latest techniques. The journey begins with an overview of MLPs, CNNs, and RNNs, which are the building blocks for the more advanced techniques in the book. You'll learn how to implement deep learning models with Keras and Tensorflow, and move forwards to advanced techniques, as you explore deep neural network architectures, including ResNet and DenseNet, and how to create Autoencoders. You then learn all about Generative Adversarial Networks (GANs), and how they can open new levels of AI performance. Variational AutoEncoders (VAEs) are implemented, and you'll see how GANs and VAEs have the generative power to synthesize data that can be extremely convincing to humans - a major stride forward for modern AI. To complete this set of advanced techniques, you'll learn how to implement Deep Reinforcement Learning (DRL) such as Deep Q-Learning and Policy Gradient Methods, which are critical to many modern results in AI. What you will learnCutting-edge techniques in human-like AI performanceImplement advanced deep learning models using KerasThe building blocks for advanced techniques - MLPs, CNNs, and RNNsDeep neural networks - ResNet and DenseNetAutoencoders and Variational AutoEncoders (VAEs)Generative Adversarial Networks (GANs) and creative AI techniquesDisentangled Representation GANs, and Cross-Domain GANsDeep Reinforcement Learning (DRL) methods and implementationProduce industry-standard applications using OpenAI gymDeep Q-Learning and Policy Gradient MethodsWho this book is for Some fluency with Python is assumed. As an advanced book, you'll be familiar with some machine learning approaches, and some practical experience with DL will be helpful. Knowledge of Keras or TensorFlow is not required but would be helpful.

The Deep Learning with Keras Workshop Matthew Moocarme,Mahla Abdollahnejad,Ritesh Bhagwat.2020-07-29 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.

Deep Learning Illustrated Jon Krohn, Grant Beyleveld, Aglaé Bassens. 2019-08-05 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.

Deep Learning with R, Second Edition Francois Chollet, Tomasz Kalinowski, J. J. Allaire. 2022-09-13 Deep learning from the ground up using R and the powerful Keras library! In *Deep Learning with R, Second Edition* you will learn: Deep learning from first principles Image classification and image segmentation Time series forecasting Text classification and machine translation Text generation, neural style transfer, and image generation *Deep Learning with R, Second Edition* shows you how to put deep learning into action. It's based on the revised new edition of François Chollet's bestselling *Deep Learning with Python*. All code and examples have been expertly translated to the R language by Tomasz Kalinowski, who maintains the Keras and Tensorflow R packages at RStudio. Novices and experienced ML practitioners will love the expert insights, practical techniques, and important theory for building neural networks. About the technology Deep learning has become essential knowledge for data scientists, researchers, and software developers. The R language APIs for Keras and TensorFlow put deep learning within reach for all R users, even if they have no experience with advanced machine learning or neural networks. This book shows you how to get started on core DL tasks like computer vision, natural language processing, and more using R. About the book *Deep Learning with R, Second Edition* is a hands-on guide to deep learning using the R language. As you move through this book, you'll quickly lock in the foundational ideas of deep learning. The intuitive explanations, crisp illustrations, and clear examples guide you through core DL skills like image processing and text manipulation, and even advanced features like transformers. This revised and expanded new edition is adapted from *Deep Learning with Python, Second Edition* by François Chollet, the creator of the Keras library. What's inside Image classification and image segmentation Time series forecasting Text classification and machine translation Text generation, neural style transfer, and image generation About the reader For readers with intermediate R skills. No previous experience with Keras, TensorFlow, or deep learning is required. About the author François Chollet is a software engineer at Google and creator of

Keras. Tomasz Kalinowski is a software engineer at RStudio and maintainer of the Keras and Tensorflow R packages. J.J. Allaire is the founder of RStudio, and the author of the first edition of this book. Table of Contents 1 What is deep learning? 2 The mathematical building blocks of neural networks 3 Introduction to Keras and TensorFlow 4 Getting started with neural networks: Classification and regression 5 Fundamentals of machine learning 6 The universal workflow of machine learning 7 Working with Keras: A deep dive 8 Introduction to deep learning for computer vision 9 Advanced deep learning for computer vision 10 Deep learning for time series 11 Deep learning for text 12 Generative deep learning 13 Best practices for the real world 14 Conclusions

Applied Deep Learning with Keras Ritesh Bhagwat, Mahla Abdolahnejad, Matthew Moocarme. 2019-04-24 Take your neural networks to a whole new level with the simplicity and modularity of Keras, the most commonly used high-level neural networks API. Key Features Solve complex machine learning problems with precision Evaluate, tweak, and improve your deep learning models and solutions Use different types of neural networks to solve real-world problems Book Description Though designing neural networks is a sought-after skill, it is not easy to master. With Keras, you can apply complex machine learning algorithms with minimum code. Applied Deep Learning with Keras starts by taking you through the basics of machine learning and Python all the way to gaining an in-depth understanding of applying Keras to develop efficient deep learning solutions. To help you grasp the difference between machine and deep learning, the book guides you on how to build a logistic regression model, first with scikit-learn and then with Keras. You will delve into Keras and its many models by creating prediction models for various real-world scenarios, such as disease prediction and customer churning. You'll gain knowledge on how to evaluate, optimize, and improve your models to achieve maximum information. Next, you'll learn to evaluate your model by cross-validating it using Keras Wrapper and scikit-learn. Following this, you'll proceed to understand how to apply L1, L2, and dropout regularization techniques to improve the accuracy of your model. To help maintain accuracy, you'll get to grips with applying techniques including null accuracy, precision, and AUC-ROC score techniques for fine tuning your model. By the end of this book, you will have the skills you need to use Keras when building high-level deep neural networks. What you will learn Understand the difference between single-layer and multi-layer neural network models Use Keras to build simple logistic regression models, deep neural networks, recurrent neural networks, and convolutional neural networks Apply L1, L2, and dropout regularization to improve the accuracy of your model Implement cross-validate using Keras wrappers with scikit-learn Understand the limitations of model accuracy Who this book is for If you have basic knowledge of data science and machine learning and want to develop your skills and learn about artificial neural networks and deep learning, you will find this book useful. Prior experience of Python programming and experience with statistics and logistic regression will help you get the most out of this book. Although not necessary, some familiarity with the scikit-learn library will be an added bonus.

Deep Learning with R François Chollet.2018-01-22 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). 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. 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

Advanced Deep Learning with Python Ivan Vasilev.2019-12-12 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 FeaturesGet to grips with building faster and more robust deep learning architecturesInvestigate and train convolutional neural network (CNN) models with GPU-accelerated libraries such as TensorFlow and PyTorchApply deep neural networks (DNNs) to computer vision problems, NLP, and GANsBook 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.

Deep Learning with Keras Antonio Gulli, Sujit Pal. 2017-04-26 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.

Deep Learning for Computer Vision Rajalingappaa Shanmugamani. 2018-01-23 Learn how to model and train advanced neural networks to implement a variety of Computer Vision tasks Key Features Train different kinds of deep learning model from scratch to solve specific problems in Computer Vision Combine the power of Python, Keras, and TensorFlow to build deep learning models for object detection, image classification, similarity learning, image captioning, and more Includes tips on optimizing and improving the performance of your models under various constraints Book Description Deep learning has shown its power in several application areas of Artificial Intelligence, especially in Computer Vision. Computer Vision is the science of understanding and manipulating images, and finds enormous applications in the areas of robotics, automation, and so on. This book will also show you, with practical examples, how to develop Computer Vision applications by leveraging the power of deep learning. In this book, you will learn different techniques related to object classification, object detection, image segmentation, captioning, image generation, face analysis, and more. You will also explore their applications using popular Python libraries such as TensorFlow and Keras. This book will help you master state-of-the-art, deep learning algorithms and their implementation. What you will learn Set up an environment for deep learning with Python, TensorFlow, and Keras Define and train a model for image and video classification Use features from a pre-trained Convolutional Neural Network model for image retrieval Understand and implement object detection using the real-world Pedestrian Detection scenario Learn about various problems in image captioning and how to overcome them by training images and text together Implement similarity matching and train a model for face recognition Understand the concept of generative models and use them for image generation Deploy your deep learning models and optimize them for high performance Who this book is for This book is targeted at data scientists and Computer Vision practitioners who wish to apply the concepts of Deep Learning to overcome any problem related to Computer Vision. A basic knowledge of programming in Python—and some understanding of machine learning concepts—is required to get the best out of this book.

Reinforcement Learning Abhishek Nandy, Manisha Biswas. 2017-12-07 Master reinforcement learning, a popular area of machine learning, starting with the basics: discover how agents and the environment evolve and then gain a clear picture

of how they are inter-related. You'll then work with theories related to reinforcement learning and see the concepts that build up the reinforcement learning process. Reinforcement Learning discusses algorithm implementations important for reinforcement learning, including Markov's Decision process and Semi Markov Decision process. The next section shows you how to get started with Open AI before looking at Open AI Gym. You'll then learn about Swarm Intelligence with Python in terms of reinforcement learning. The last part of the book starts with the TensorFlow environment and gives an outline of how reinforcement learning can be applied to TensorFlow. There's also coverage of Keras, a framework that can be used with reinforcement learning. Finally, you'll delve into Google's Deep Mind and see scenarios where reinforcement learning can be used. What You'll Learn Absorb the core concepts of the reinforcement learning process Use advanced topics of deep learning and AI Work with Open AI Gym, Open AI, and Python Harness reinforcement learning with TensorFlow and Keras using Python Who This Book Is For Data scientists, machine learning and deep learning professionals, developers who want to adapt and learn reinforcement learning.

Hands-On Transfer Learning with Python Dipanjan Sarkar, Raghav Bali, Tamoghna Ghosh. 2018-08-31 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.

Deep Learning with Keras Antonio Gulli,Sujit Pal.2017-04-26 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.

Deep Learning with TensorFlow 2 and Keras Antonio Gulli,Amita Kapoor,Sujit Pal.2019-12-27 Build machine and deep learning systems with the newly released TensorFlow 2 and Keras for the lab, production, and mobile devices Key FeaturesIntroduces and then uses TensorFlow 2 and Keras right from the startTeaches key machine and deep learning techniquesUnderstand the fundamentals of deep learning and machine learning through clear explanations and extensive code samplesBook Description Deep Learning with TensorFlow 2 and Keras, Second Edition teaches neural networks and

deep learning techniques alongside TensorFlow (TF) and Keras. You'll learn how to write deep learning applications in the most powerful, popular, and scalable machine learning stack available. TensorFlow is the machine learning library of choice for professional applications, while Keras offers a simple and powerful Python API for accessing TensorFlow. TensorFlow 2 provides full Keras integration, making advanced machine learning easier and more convenient than ever before. This book also introduces neural networks with TensorFlow, runs through the main applications (regression, ConvNets (CNNs), GANs, RNNs, NLP), covers two working example apps, and then dives into TF in production, TF mobile, and using TensorFlow with AutoML. What you will learn

Build machine learning and deep learning systems with TensorFlow 2 and the Keras API
Use Regression analysis, the most popular approach to machine learning
Understand ConvNets (convolutional neural networks) and how they are essential for deep learning systems such as image classifiers
Use GANs (generative adversarial networks) to create new data that fits with existing patterns
Discover RNNs (recurrent neural networks) that can process sequences of input intelligently, using one part of a sequence to correctly interpret another
Apply deep learning to natural human language and interpret natural language texts to produce an appropriate response
Train your models on the cloud and put TF to work in real environments
Explore how Google tools can automate simple ML workflows without the need for complex modeling

Who this book is for This book is for Python developers and data scientists who want to build machine learning and deep learning systems with TensorFlow. This book gives you the theory and practice required to use Keras, TensorFlow 2, and AutoML to build machine learning systems. Some knowledge of machine learning is expected.

Advanced Deep Learning for Engineers and Scientists Kolla Bhanu Prakash, Ramani Kannan, S. Albert Alexander, G. R. Kanagachidambaresan. 2021-07-24 This book provides a complete illustration of deep learning concepts with case-studies and practical examples useful for real time applications. This book introduces a broad range of topics in deep learning. The authors start with the fundamentals, architectures, tools needed for effective implementation for scientists. They then present technical exposure towards deep learning using Keras, Tensorflow, Pytorch and Python. They proceed with advanced concepts with hands-on sessions for deep learning. Engineers, scientists, researches looking for a practical approach to deep learning will enjoy this book. Presents practical basics to advanced concepts in deep learning and how to apply them through various projects; Discusses topics such as deep learning in smart grids and renewable energy & sustainable development; Explains how to implement advanced techniques in deep learning using Pytorch, Keras, Python programming.

Deep Learning with Keras Frank Millstein. 2020-07-07 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 Frank Millstein.2020-08-14 Deep Learning - 2 BOOK BUNDLE!! 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... Convolutional Neural Networks in Python This book covers the basics behind Convolutional Neural Networks by introducing you to this complex world of deep learning and artificial neural networks in a simple and easy to understand way. It is perfect for any beginner out there looking forward to learning more about this machine learning field. This book is all about how to use convolutional neural networks for various image, object and other common classification problems in Python. Here, we also take a deeper look into various Keras layer used for building CNNs we take a look at different activation functions and much more, which will eventually lead you to creating highly accurate models able of performing great task results on various image classification, object classification and other problems. Therefore, at the end of the book, you will have a better insight into this world, thus you will be more than prepared to deal with more complex and challenging tasks on your own. Here Is a Preview of What You'll Learn In This Book... Convolutional neural networks structure How convolutional neural networks actually work Convolutional neural networks applications The importance of convolution operator Different convolutional neural networks layers and their importance Arrangement of spatial parameters How and when to use stride and zero-padding Method of parameter sharing Matrix multiplication and its importance Pooling and dense layers Introducing non-linearity relu activation function How to train your convolutional neural network models using backpropagation How and why to apply dropout CNN model training process How to build a convolutional neural

network Generating predictions and calculating loss functions How to train and evaluate your MNIST classifier How to build a simple image classification CNN And much, much more! Get this book bundle NOW and SAVE money!

Deep Learning with TensorFlow Giancarlo Zaccone, Md. Rezaul Karim. 2018-03-30 Delve into neural networks, implement deep learning algorithms, and explore layers of data abstraction with the help of TensorFlow. Key Features 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 Gain real-world contextualization through some deep learning problems concerning research and application Book Description Deep learning is a branch of machine learning algorithms based on learning multiple levels of abstraction. Neural networks, which are at the core of deep learning, are being used in predictive analytics, computer vision, natural language processing, time series forecasting, and to perform a myriad of other complex tasks. This book is conceived for developers, data analysts, machine learning practitioners and deep learning enthusiasts who want to build powerful, robust, and accurate predictive models with the power of TensorFlow, combined with other open source Python libraries. Throughout the book, you'll learn how to develop deep learning applications for machine learning systems using Feedforward Neural Networks, Convolutional Neural Networks, Recurrent Neural Networks, Autoencoders, and Factorization Machines. Discover how to attain deep learning programming on GPU in a distributed way. You'll come away with an in-depth knowledge of machine learning techniques and the skills to apply them to real-world projects. What you will learn Apply deep machine intelligence and GPU computing with TensorFlow Access public datasets and use TensorFlow to load, process, and transform the data Discover how to use the high-level TensorFlow API to build more powerful applications Use 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 Who this book is for The book is for 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.

Neural Networks with Keras Cookbook V Kishore Ayyadevara. 2019-02-28 Implement neural network architectures by building them from scratch for multiple real-world applications. Key Features From scratch, build multiple neural network architectures such as CNN, RNN, LSTM in Keras Discover tips and tricks for designing a robust neural network to solve real-world problems Graduate from understanding the working details of neural networks and master the art of fine-tuning them Book Description This book will take you from the basics of neural networks to advanced implementations of architectures using a recipe-based approach. We will learn about how neural networks work and the impact of various hyper parameters on a network's accuracy along with leveraging neural networks for structured and unstructured data. Later, we

will learn how to classify and detect objects in images. We will also learn to use transfer learning for multiple applications, including a self-driving car using Convolutional Neural Networks. We will generate images while leveraging GANs and also by performing image encoding. Additionally, we will perform text analysis using word vector based techniques. Later, we will use Recurrent Neural Networks and LSTM to implement chatbot and Machine Translation systems. Finally, you will learn about transcribing images, audio, and generating captions and also use Deep Q-learning to build an agent that plays Space Invaders game. By the end of this book, you will have developed the skills to choose and customize multiple neural network architectures for various deep learning problems you might encounter. What you will learn

- Build multiple advanced neural network architectures from scratch
- Explore transfer learning to perform object detection and classification
- Build self-driving car applications using instance and semantic segmentation
- Understand data encoding for image, text and recommender systems
- Implement text analysis using sequence-to-sequence learning
- Leverage a combination of CNN and RNN to perform end-to-end learning
- Build agents to play games using deep Q-learning

Who this book is for This intermediate-level book targets beginners and intermediate-level machine learning practitioners and data scientists who have just started their journey with neural networks. This book is for those who are looking for resources to help them navigate through the various neural network architectures; you'll build multiple architectures, with concomitant case studies ordered by the complexity of the problem. A basic understanding of Python programming and a familiarity with basic machine learning are all you need to get started with this book.

Mastering TensorFlow 1.x Armando Fandango. 2018-01-22 Build, scale, and deploy deep neural network models using the star libraries in Python

Key Features Delve into advanced machine learning and deep learning use cases using Tensorflow and Keras Build, deploy, and scale end-to-end deep neural network models in a production environment Learn to deploy TensorFlow on mobile, and distributed TensorFlow on GPU, Clusters, and Kubernetes

Book Description TensorFlow is the most popular numerical computation library built from the ground up for distributed, cloud, and mobile environments. TensorFlow represents the data as tensors and the computation as graphs. This book is a comprehensive guide that lets you explore the advanced features of TensorFlow 1.x. Gain insight into TensorFlow Core, Keras, TF Estimators, TFLearn, TF Slim, Pretty Tensor, and Sonnet. Leverage the power of TensorFlow and Keras to build deep learning models, using concepts such as transfer learning, generative adversarial networks, and deep reinforcement learning. Throughout the book, you will obtain hands-on experience with varied datasets, such as MNIST, CIFAR-10, PTB, text8, and COCO-Images. You will learn the advanced features of TensorFlow 1.x, such as distributed TensorFlow with TF Clusters, deploy production models with TensorFlow Serving, and build and deploy TensorFlow models for mobile and embedded devices on Android and iOS platforms. You will see how to call TensorFlow and Keras API within the R statistical software, and learn the required techniques for debugging when the TensorFlow API-based code does not work as expected. The book helps you obtain in-

depth knowledge of TensorFlow, making you the go-to person for solving artificial intelligence problems. By the end of this guide, you will have mastered the offerings of TensorFlow and Keras, and gained the skills you need to build smarter, faster, and efficient machine learning and deep learning systems. What you will learn Master advanced concepts of deep learning such as transfer learning, reinforcement learning, generative models and more, using TensorFlow and Keras Perform supervised (classification and regression) and unsupervised (clustering) learning to solve machine learning tasks Build end-to-end deep learning (CNN, RNN, and Autoencoders) models with TensorFlow Scale and deploy production models with distributed and high-performance computing on GPU and clusters Build TensorFlow models to work with multilayer perceptrons using Keras, TFLearn, and R Learn the functionalities of smart apps by building and deploying TensorFlow models on iOS and Android devices Supercharge TensorFlow with distributed training and deployment on Kubernetes and TensorFlow Clusters Who this book is for This book is for data scientists, machine learning engineers, artificial intelligence engineers, and for all TensorFlow users who wish to upgrade their TensorFlow knowledge and work on various machine learning and deep learning problems. If you are looking for an easy-to-follow guide that underlines the intricacies and complex use cases of machine learning, you will find this book extremely useful. Some basic understanding of TensorFlow is required to get the most out of the book.

Deep Learning Essentials Anurag Bhardwaj, Wei Di, Jianing Wei. 2018-01-30 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.

Deep Learning with TensorFlow and Keras Amita Kapoor, Antonio Gulli, Sujit Pal, Francois Chollet. 2022-10-06 Build cutting edge machine and deep learning systems for the lab, production, and mobile devices Key Features Understand the fundamentals of deep learning and machine learning through clear explanations and extensive code samples Implement graph neural networks, transformers using Hugging Face and TensorFlow Hub, and joint and contrastive learning Learn cutting-edge machine and deep learning techniques Book Description Deep Learning with TensorFlow and Keras teaches you neural networks and deep learning techniques using TensorFlow (TF) and Keras. You'll learn how to write deep learning applications in the most powerful, popular, and scalable machine learning stack available. TensorFlow 2.x focuses on simplicity and ease of use, with updates like eager execution, intuitive higher-level APIs based on Keras, and flexible model building on any platform. This book uses the latest TF 2.0 features and libraries to present an overview of supervised and unsupervised machine learning models and provides a comprehensive analysis of deep learning and reinforcement learning models using practical examples for the cloud, mobile, and large production environments. This book also shows you how to create neural networks with TensorFlow, runs through popular algorithms (regression, convolutional neural networks (CNNs), transformers, generative adversarial networks (GANs), recurrent neural networks (RNNs), natural language processing (NLP), and graph neural networks (GNNs)), covers working example apps, and then dives into TF in production, TF mobile, and TensorFlow with AutoML. What you will learn Learn how to use the popular GNNs with TensorFlow to carry out graph mining tasks Discover the world of transformers, from pretraining to fine-tuning to evaluating them Apply self-supervised learning to natural language processing, computer vision, and audio signal processing Combine probabilistic and deep learning models using TensorFlow Probability Train your models on the cloud and put TF to work in real environments Build machine learning and deep learning systems with TensorFlow 2.x and the Keras API Who this book is for This hands-on machine learning book is for Python developers and data scientists who want to build machine learning and deep learning systems with TensorFlow. This book gives you the theory and practice required to use Keras, TensorFlow, and AutoML to build machine learning systems. Some machine learning knowledge would be useful. We don't assume TF

knowledge.

Advanced Deep Learning with R Bharatendra Rai.2019-12-16 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.

[Deep Learning Quick Reference](#) Michael Bernico.2018-03-09 Dive deeper into neural networks and get your models trained, optimized with this quick reference guide Key Features A quick reference to all important deep learning concepts and their implementations Essential tips, tricks, and hacks to train a variety of deep learning models such as CNNs, RNNs, LSTMs, and more Supplemented with essential mathematics and theory, every chapter provides best practices and safe choices for training and fine-tuning your models in Keras and Tensorflow. Book Description Deep learning has become an essential necessity to enter the world of artificial intelligence. With this book deep learning techniques will become more

accessible, practical, and relevant to practicing data scientists. It moves deep learning from academia to the real world through practical examples. You will learn how Tensor Board is used to monitor the training of deep neural networks and solve binary classification problems using deep learning. Readers will then learn to optimize hyperparameters in their deep learning models. The book then takes the readers through the practical implementation of training CNN's, RNN's, and LSTM's with word embeddings and seq2seq models from scratch. Later the book explores advanced topics such as Deep Q Network to solve an autonomous agent problem and how to use two adversarial networks to generate artificial images that appear real. For implementation purposes, we look at popular Python-based deep learning frameworks such as Keras and Tensorflow, Each chapter provides best practices and safe choices to help readers make the right decision while training deep neural networks. By the end of this book, you will be able to solve real-world problems quickly with deep neural networks. What you will learn Solve regression and classification challenges with TensorFlow and Keras Learn to use Tensor Board for monitoring neural networks and its training Optimize hyperparameters and safe choices/best practices Build CNN's, RNN's, and LSTM's and using word embedding from scratch Build and train seq2seq models for machine translation and chat applications. Understanding Deep Q networks and how to use one to solve an autonomous agent problem. Explore Deep Q Network and address autonomous agent challenges. Who this book is for If you are a Data Scientist or a Machine Learning expert, then this book is a very useful read in training your advanced machine learning and deep learning models. You can also refer this book if you are stuck in-between the neural network modeling and need immediate assistance in getting accomplishing the task smoothly. Some prior knowledge of Python and tight hold on the basics of machine learning is required.

TensorFlow Machine Learning Projects Ankit Jain,Armando Fandango,Amita Kapoor.2018-11-30 Implement TensorFlow's offerings such as TensorBoard, TensorFlow.js, TensorFlow Probability, and TensorFlow Lite to build smart automation projects Key FeaturesUse machine learning and deep learning principles to build real-world projectsGet to grips with TensorFlow's impressive range of module offeringsImplement projects on GANs, reinforcement learning, and capsule networkBook Description TensorFlow has transformed the way machine learning is perceived. TensorFlow Machine Learning Projects teaches you how to exploit the benefits—simplicity, efficiency, and flexibility—of using TensorFlow in various real-world projects. With the help of this book, you'll not only learn how to build advanced projects using different datasets but also be able to tackle common challenges using a range of libraries from the TensorFlow ecosystem. To start with, you'll get to grips with using TensorFlow for machine learning projects; you'll explore a wide range of projects using TensorForest and TensorBoard for detecting exoplanets, TensorFlow.js for sentiment analysis, and TensorFlow Lite for digit classification. As you make your way through the book, you'll build projects in various real-world domains, incorporating natural language processing (NLP), the Gaussian process, autoencoders, recommender systems, and Bayesian neural networks, along with

trending areas such as Generative Adversarial Networks (GANs), capsule networks, and reinforcement learning. You'll learn how to use the TensorFlow on Spark API and GPU-accelerated computing with TensorFlow to detect objects, followed by how to train and develop a recurrent neural network (RNN) model to generate book scripts. By the end of this book, you'll have gained the required expertise to build full-fledged machine learning projects at work. What you will learn

- Understand the TensorFlow ecosystem using various datasets and techniques
- Create recommendation systems for quality product recommendations
- Build projects using CNNs, NLP, and Bayesian neural networks
- Play Pac-Man using deep reinforcement learning
- Deploy scalable TensorFlow-based machine learning systems
- Generate your own book script using RNNs

Who this book is for TensorFlow Machine Learning Projects is for you if you are a data analyst, data scientist, machine learning professional, or deep learning enthusiast with basic knowledge of TensorFlow. This book is also for you if you want to build end-to-end projects in the machine learning domain using supervised, unsupervised, and reinforcement learning techniques

Advanced Deep Learning with R Bharatendra Rai. 2019-12-17 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.

Hands-On Neural Networks with Keras Niloy Purkait.2019-03-30 Your one-stop guide to learning and implementing artificial neural networks with Keras effectively Key Features Design and create neural network architectures on different domains using Keras Integrate neural network models in your applications using this highly practical guide Get ready for the future of neural networks through transfer learning and predicting multi network models Book Description Neural networks are used to solve a wide range of problems in different areas of AI and deep learning. Hands-On Neural Networks with Keras will start with teaching you about the core concepts of neural networks. You will delve into combining different neural network models and work with real-world use cases, including computer vision, natural language understanding, synthetic data generation, and many more. Moving on, you will become well versed with convolutional neural networks (CNNs), recurrent neural networks (RNNs), long short-term memory (LSTM) networks, autoencoders, and generative adversarial networks (GANs) using real-world training datasets. We will examine how to use CNNs for image recognition, how to use reinforcement learning agents, and many more. We will dive into the specific architectures of various networks and then implement each of them in a hands-on manner using industry-grade frameworks. By the end of this book, you will be highly familiar with all prominent deep learning models and frameworks, and the options you have when applying deep learning to real-world scenarios and embedding artificial intelligence as the core fabric of your organization. What you will learn Understand the fundamental nature and workflow of predictive data modeling Explore how different types of visual and linguistic signals are processed by neural networks Dive into the mathematical and statistical ideas behind how networks learn from data Design and implement various neural networks such as CNNs, LSTMs, and GANs Use different architectures to tackle cognitive tasks and embed intelligence in systems Learn how to generate synthetic data and use augmentation strategies to improve your models Stay on top of the latest academic and commercial developments in the field of AI Who this book is for This book is for machine learning practitioners, deep learning researchers and AI enthusiasts who are looking to get well versed with different neural network architecture using Keras. Working knowledge of Python programming language is mandatory.

Practical Convolutional Neural Networks Mohit Sewak, Md. Rezaul Karim, Pradeep Pujari.2018-02-27 One stop guide to implementing award-winning, and cutting-edge CNN architectures Key Features Fast-paced guide with use cases and real-world examples to get well versed with CNN techniques Implement CNN models on image classification, transfer learning, Object Detection, Instance Segmentation, GANs and more Implement powerful use-cases like image captioning, reinforcement learning for hard attention, and recurrent attention models Book Description Convolutional Neural Network

(CNN) is revolutionizing several application domains such as visual recognition systems, self-driving cars, medical discoveries, innovative eCommerce and more. You will learn to create innovative solutions around image and video analytics to solve complex machine learning and computer vision related problems and implement real-life CNN models. This book starts with an overview of deep neural networks with the example of image classification and walks you through building your first CNN for human face detector. We will learn to use concepts like transfer learning with CNN, and Auto-Encoders to build very powerful models, even when not much of supervised training data of labeled images is available. Later we build upon the learning achieved to build advanced vision related algorithms for object detection, instance segmentation, generative adversarial networks, image captioning, attention mechanisms for vision, and recurrent models for vision. By the end of this book, you should be ready to implement advanced, effective and efficient CNN models at your professional project or personal initiatives by working on complex image and video datasets. What you will learn From CNN basic building blocks to advanced concepts understand practical areas they can be applied to Build an image classifier CNN model to understand how different components interact with each other, and then learn how to optimize it Learn different algorithms that can be applied to Object Detection, and Instance Segmentation Learn advanced concepts like attention mechanisms for CNN to improve prediction accuracy Understand transfer learning and implement award-winning CNN architectures like AlexNet, VGG, GoogLeNet, ResNet and more Understand the working of generative adversarial networks and how it can create new, unseen images Who this book is for This book is for data scientists, machine learning and deep learning practitioners, Cognitive and Artificial Intelligence enthusiasts who want to move one step further in building Convolutional Neural Networks. Get hands-on experience with extreme datasets and different CNN architectures to build efficient and smart ConvNet models. Basic knowledge of deep learning concepts and Python programming language is expected.

Advanced Deep Learning with TensorFlow 2 and Keras Rowel Atienza. 2020-02-28 Updated and revised second edition of the bestselling guide to advanced deep learning with TensorFlow 2 and Keras Key Features Explore the most advanced deep learning techniques that drive modern AI results New coverage of unsupervised deep learning using mutual information, object detection, and semantic segmentation Completely updated for TensorFlow 2.x Book Description Advanced Deep Learning with TensorFlow 2 and Keras, Second Edition is a completely updated edition of the bestselling guide to the advanced deep learning techniques available today. Revised for TensorFlow 2.x, this edition introduces you to the practical side of deep learning with new chapters on unsupervised learning using mutual information, object detection (SSD), and semantic segmentation (FCN and PSPNet), further allowing you to create your own cutting-edge AI projects. Using Keras as an open-source deep learning library, the book features hands-on projects that show you how to create more effective AI with the most up-to-date techniques. Starting with an overview of multi-layer perceptrons (MLPs), convolutional neural networks (CNNs), and recurrent neural networks (RNNs), the book then introduces more cutting-edge techniques as you explore deep

neural network architectures, including ResNet and DenseNet, and how to create autoencoders. You will then learn about GANs, and how they can unlock new levels of AI performance. Next, you'll discover how a variational autoencoder (VAE) is implemented, and how GANs and VAEs have the generative power to synthesize data that can be extremely convincing to humans. You'll also learn to implement DRL such as Deep Q-Learning and Policy Gradient Methods, which are critical to many modern results in AI. What you will learn

- Use mutual information maximization techniques to perform unsupervised learning
- Use segmentation to identify the pixel-wise class of each object in an image
- Identify both the bounding box and class of objects in an image using object detection
- Learn the building blocks for advanced techniques - MLPs, CNN, and RNNs
- Understand deep neural networks - including ResNet and DenseNet
- Understand and build autoregressive models - autoencoders, VAEs, and GANs
- Discover and implement deep reinforcement learning methods

Who this book is for This is not an introductory book, so fluency with Python is required. The reader should also be familiar with some machine learning approaches, and practical experience with DL will also be helpful. Knowledge of Keras or TensorFlow 2.0 is not required but is recommended.

TensorFlow Machine Learning Benjamin Smith. 2021-01-04 Have you ever wondered how machine learning works? These days, machine learning, deep learning and neural nets are common terms and they are here to stay as a part of our everyday language. Machine learning is not the easiest of topics to teach, purely because there is so much to it. Machine learning, deep learning and artificial intelligence are used in more applications than most humans even think about - email, Amazon, Netflix, Spotify, and other popular online marketplaces use machine learning to weed out spam emails and bring you recommendations based on your shopping or streaming preferences. Machine learning is used in healthcare, in finance, in just about every industry you can think of - it's here to stay, whether we like it or not. One of the most important parts of learning machine learning is knowing which algorithm to choose and which library. Python is the most popular machine learning programming language and it has a huge advantage over other languages - the large amount of built-in libraries; three of the most important are TensorFlow, Keras and Scikit-Learn. And that's what this book is about - machine learning with TensorFlow, Keras and Scikit-learn. Here's what you will learn:

- What machine learning is
- How it applies in the real world
- Different models and learning types
- Different machine learning algorithms
- Deep learning vs. machine learning
- What TensorFlow is and how to use it
- What TensorFlow comprises
- Operators, variables, placeholders, and more
- What Keras is and how to use it
- Keras vs. TensorFlow
- How to use Keras for linear regression
- How to use Keras to build a neural net
- What Scikit-Learn is and how to use it
- Using Scikit-Learn to build regression and classification trees
- How to build a random forest model
- How to install Keras, TensorFlow and Scikit-Learn

And much more! All the practical examples in the book use Python, so you are expected to need some knowledge of the language before you start. If you're looking to advanced your skills in machine learning, then this is the book for you! Grab your copy of this book today!

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Python Deep Learning Ivan Vasilev, Daniel Slater, Gianmario Spacagna, Peter Roelants, Valentino Zocca. 2019-01-16 Learn advanced state-of-the-art deep learning techniques and their applications using popular Python libraries

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Book Description With the surge in artificial intelligence in applications catering to both business and consumer needs, deep learning is more important than ever for meeting current and future market demands. With this book, you'll explore deep learning, and learn how to put machine learning to use in your projects. This second edition of Python Deep Learning will get you up to speed with deep learning, deep neural networks, and how to train them with high-performance algorithms and popular Python frameworks. You'll uncover different neural network architectures, such as convolutional networks, recurrent neural networks, long short-term memory (LSTM) networks, and capsule networks. You'll also learn how to solve problems in the fields of computer vision, natural language processing (NLP), and speech recognition. You'll study generative model approaches such as variational autoencoders and Generative Adversarial Networks (GANs) to generate images. As you delve into newly evolved areas of reinforcement learning, you'll gain an understanding of state-of-the-art algorithms that are the main components behind popular games Go, Atari, and Dota. By the end of the book, you will be well-versed with the theory of deep learning along with its real-world applications.

What you will learn Grasp the mathematical theory behind neural networks and deep learning processes Investigate and resolve computer vision challenges using convolutional networks and capsule networks Solve generative tasks using variational autoencoders and Generative Adversarial Networks Implement complex NLP tasks using recurrent networks (LSTM and GRU) and attention models Explore reinforcement learning and understand how agents behave in a complex environment Get up to date with applications of deep learning in autonomous vehicles

Who this book is for This book is for data science practitioners, machine

learning engineers, and those interested in deep learning who have a basic foundation in machine learning and some Python programming experience. A background in mathematics and conceptual understanding of calculus and statistics will help you gain maximum benefit from this book.

Deep Learning With Python Benjamin Smith.2021-01-04 Are you interested in taking your deep learning knowledge to the next level? Then this is the book for you! Machine and deep learning are the future, and there's no getting away from that. So learning it now, and learning how to do it the right way will put you ahead of the crowd. Deep learning is all about understanding and learning about neural networks, and Python is the best computer programming language to do that with. Learning to program is not easy, but consistent practice is the key. Learning to program efficiently in Python and building deep learning neural networks becomes simple to do with practice and guidance. In this book, you will learn: -The basics of the Python programming language-All about variables, strings, classes, statements, dictionaries, functions, and more-What Artificial Intelligence is-What Deep Learning is-How to build a deep neural network with Keras-How to build a deep learning convolutional neural network-The practical applications of deep learning-The benefits and the drawbacks of deep learning And so much more! Don't delay. Start your advanced deep learning journey today by clicking the Buy Now button!

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