Cs224d Tensorflow Tutorial

"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. Table of Contents PART 1 - CORE PYTORCH 1 Introducing deep learning and the PyTorch Library 2 Pretrained networks 3 It starts with a tensor 4 Real-world data representation using tensors 5 The mechanics of learning 6 Using a neural network to fit the data 7 Telling birds from airplanes: Learning from images 8 Using convolutions to generalize PART 2 - LEARNING FROM IMAGES IN THE REAL WORLD: EARLY DETECTION OF LUNG CANCER 9 Using PyTorch to fight cancer 10 Combining data sources into a

unified dataset 11 Training a classification model to detect suspected tumors 12 Improving training with metrics and augmentation 13 Using segmentation to find suspected nodules 14 End-to-end nodule analysis, and where to go next PART 3 - DEPLOYMENT 15 Deploying to production

Natural Language Processing (NLP) provides boundless opportunities for solving problems in artificial intelligence, making products such as Amazon Alexa and Google Translate possible. If you're a developer or data scientist new to NLP and deep learning, this practical guide shows you how to apply these methods using PyTorch, a Python-based deep learning library. Authors Delip Rao and Brian McMahon provide you with a solid grounding in NLP and deep learning algorithms and demonstrate how to use PyTorch to build applications involving rich representations of text specific to the problems you face. Each chapter includes several code examples and illustrations. Explore computational graphs and the supervised learning paradigm Master the basics of the PyTorch optimized tensor manipulation library Get an overview of traditional NLP concepts and methods Learn the basic ideas involved in building neural networks Use embeddings to represent words, sentences, documents, and other features Explore sequence prediction and generate sequence-to-sequence models Learn design patterns for building production NLP systems

This book covers deep-learning-based approaches for sentiment analysis, a relatively new, but fast-growing research area, which has significantly changed in the past few

years. The book presents a collection of state-of-the-art approaches, focusing on the best-performing, cutting-edge solutions for the most common and difficult challenges faced in sentiment analysis research. Providing detailed explanations of the methodologies, the book is a valuable resource for researchers as well as newcomers to the field.

In recent years, deep learning has fundamentally changed the landscapes of a number of areas in artificial intelligence, including speech, vision, natural language, robotics, and game playing. In particular, the striking success of deep learning in a wide variety of natural language processing (NLP) applications has served as a benchmark for the advances in one of the most important tasks in artificial intelligence. This book reviews the state of the art of deep learning research and its successful applications to major NLP tasks, including speech recognition and understanding, dialogue systems, lexical analysis, parsing, knowledge graphs, machine translation, question answering, sentiment analysis, social computing, and natural language generation from images. Outlining and analyzing various research frontiers of NLP in the deep learning era, it features self-contained, comprehensive chapters written by leading researchers in the field. A glossary of technical terms and commonly used acronyms in the intersection of deep learning and NLP is also provided. The book appeals to advanced undergraduate and graduate students, post-doctoral researchers, lecturers and industrial researchers, as well as anyone interested in deep learning and natural language processing.

Summary Online recommender systems help users find movies, jobs, restaurants-even romance! There's an art in combining statistics, demographics, and query terms to achieve results that will delight them. Learn to build a recommender system the right way: it can make or break your application! Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Recommender systems are everywhere, helping you find everything from movies to jobs, restaurants to hospitals, even romance. Using behavioral and demographic data, these systems make predictions about what users will be most interested in at a particular time, resulting in high-quality, ordered, personalized suggestions. Recommender systems are practically a necessity for keeping your site content current, useful, and interesting to your visitors. About the Book Practical Recommender Systems explains how recommender systems work and shows how to create and apply them for your site. After covering the basics, you'll see how to collect user data and produce personalized recommendations. You'll learn how to use the most popular recommendation algorithms and see examples of them in action on sites like Amazon and Netflix. Finally, the book covers scaling problems and other issues you'll encounter as your site grows. What's inside How to collect and understand user behavior Collaborative and content-based filtering Machine learning algorithms Real-world examples in Python About the Reader Readers need intermediate programming and database skills. About the Author Kim Falk is an experienced data scientist who

works daily with machine learning and recommender systems. Table of Contents PART 1 - GETTING READY FOR RECOMMENDER SYSTEMS What is a recommender? User behavior and how to collect it Monitoring the system Ratings and how to calculate them Non-personalized recommendations The user (and content) who came in from the cold PART 2 - RECOMMENDER ALGORITHMS Finding similarities among users and among content Collaborative filtering in the neighborhood Evaluating and testing your recommender Content-based filtering Finding hidden genres with matrix factorization Taking the best of all algorithms: implementing hybrid recommenders Ranking and learning to rank Future of recommender systems

Neural networks are a family of powerful machine learning models. This book focuses on the application of neural network models to natural language data. The first half of the book (Parts I and II) covers the basics of supervised machine learning and feed-forward neural networks, the basics of working with machine learning over language data, and the use of vector-based rather than symbolic representations for words. It also covers the computation-graph abstraction, which allows to easily define and train arbitrary neural networks, and is the basis behind the design of contemporary neural network software libraries. The second part of the book (Parts III and IV) introduces more specialized neural network architectures, including 1D convolutional neural networks, recurrent neural networks, conditioned-generation models, and attention-based models. These architectures and techniques are the driving force behind state-of-

the-art algorithms for machine translation, syntactic parsing, and many other applications. Finally, we also discuss tree-shaped networks, structured prediction, and the prospects of multi-task learning.
This book is designed to guide you through TensorFlow and how to use it effectively. Throughout the book, you will work through recipes and get hands-on experience to perform complex data computations, gain insights into your data, and more.
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.

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 This book is for beginners who are looking for a strong foundation to build deep learning models from scratch. You will test your understanding of the concepts and measure your progress at the end of each chapter. You will have a firm understanding of deep learning and will be able to identify which algorithms are appropriate for different tasks. The book includes research papers on current developments in the field of soft computing and signal processing, selected from papers presented at the International Conference on Soft Computing and Signal Processing (ICSCSP 2018). It features papers on current topics, such as soft sets, rough sets, fuzzy logic, neural networks, genetic algorithms and machine learning. It also discusses various aspects of these topics, like technologies, product implementation, and application issues. This book includes high-quality, peer-reviewed research papers from the 6thInternational Conference on Innovations in Computer Science & Engineering (ICICSE 2018), held at Guru Nanak Institutions, Hyderabad, India from August 17 to 18, 2018. The book discusses a wide variety of industrial, engineering and scientific applications of the emerging techniques and offers a platform for researchers from academia and industry to present their original work and exchange ideas, information, techniques and applications in the field of computer science.

Learn how to apply TensorFlow to a wide range of deep learning and Machine Learning problems with this practical guide on training CNNs for image classification, image recognition, object detection and many computer vision challenges. Key Features Learn the fundamentals of Convolutional Neural Networks Harness Python and Tensorflow to train CNNs Build scalable deep learning models that can process millions of items Book Description Convolutional Neural Networks (CNN) are one of the most popular architectures used in computer vision apps. This book is an introduction to CNNs through solving real-world problems in deep learning while teaching you their implementation in popular Python library - TensorFlow. By the end of the book, you will be training CNNs in no time! We start with an overview of popular machine learning and deep learning models, and then get you set up with a TensorFlow development environment. This environment is the basis for implementing and training deep learning models in later chapters. Then, you will use Convolutional Neural Networks to work on problems such as image classification, object detection, and semantic segmentation. After that, you will use transfer learning to see how these models can solve other deep learning problems. You will also get a taste of implementing generative models such as autoencoders and generative adversarial networks. Later on, you will see useful tips on machine learning best practices and troubleshooting. Finally, you will learn how to apply your models on large datasets of millions of images. What you will learn Train machine learning models with TensorFlow Create systems that can evolve and scale during their life cycle Use CNNs in image recognition and classification Use TensorFlow for building deep learning models Train popular deep learning models Fine-tune a neural network to improve the quality of results with transfer learning Build TensorFlow models that can scale to large

datasets and systems Who this book is for This book is for Software Engineers, Data Scientists, or Machine Learning practitioners who want to use CNNs for solving real-world problems. Knowledge of basic machine learning concepts, linear algebra and Python will help. 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.

Deep Learning is the heart of Artificial Intelligence and will become a most important field in Data Science in the near future. Deep Learning has attracted much attention recently. It is usually carried out by the gradient descent method, which is not always easy to understand for beginners. When one starts studying Deep Learning first hurdles are (1) how to choose the learning rate (2) how to avoid being trapped by local minima (3) what is a deep meaning of the minibatch. In this book I plan to offer intuitive answers to these questions within my

understandings. As a matter of course, when beginners study Deep Learning some mathematical knowledge from Calculus, Linear Algebra, Statistics and Information are required. In the book I gave minimum knowledge required for understanding Deep learning. After reading the book, readers are encouraged to challenge advanced books of Deep Learning (or Artificial Intelligence).

Deep learning is the most interesting and powerful machine learning technique right now. Top deep learning libraries are available on the Python ecosystem like Theano and TensorFlow. Tap into their power in a few lines of code using Keras, the best-of-breed applied deep learning library. In this Ebook, learn exactly how to get started and apply deep learning to your own machine learning projects.

This book describes how neural networks operate from the mathematical point of view. As a result, neural networks can be interpreted both as function universal approximators and information processors. The book bridges the gap between ideas and concepts of neural networks, which are used nowadays at an intuitive level, and the precise modern mathematical language, presenting the best practices of the former and enjoying the robustness and elegance of the latter. This book can be used in a graduate course in deep learning, with the first few parts being accessible to senior undergraduates. In addition, the book will be of wide interest to machine learning researchers who are interested in a theoretical understanding of the subject.

Learn how to solve challenging machine learning problems with TensorFlow, Google's revolutionary new software library for deep learning. If you have some background in basic linear algebra and calculus, this practical book introduces machine-learning fundamentals by

showing you how to design systems capable of detecting objects in images, understanding text, analyzing video, and predicting the properties of potential medicines. TensorFlow for Deep Learning teaches concepts through practical examples and helps you build knowledge of deep learning foundations from the ground up. It's ideal for practicing developers with experience designing software systems, and useful for scientists and other professionals familiar with scripting but not necessarily with designing learning algorithms. Learn TensorFlow fundamentals, including how to perform basic computation Build simple learning systems to understand their mathematical foundations Dive into fully connected deep networks used in thousands of applications Turn prototypes into high-quality models with hyperparameter optimization Process images with convolutional neural networks Handle natural language datasets with recurrent neural networks Use reinforcement learning to solve games such as tic-tac-toe Train deep networks with hardware including GPUs and tensor processing units With existent uses ranging from motion detection to music synthesis to financial forecasting, recurrent neural networks have generated widespread attention. The tremendous interest in these networks drives Recurrent Neural Networks: Design and Applications, a summary of the design, applications, current research, and challenges of this subfield of artificial neural networks. This overview incorporates every aspect of recurrent neural networks. It outlines the wide variety of complex learning techniques and associated research projects. Each chapter addresses architectures, from fully connected to partially connected, including recurrent multilayer feedforward. It presents problems involving trajectories, control systems, and robotics, as well as RNN use in chaotic systems. The authors also share their expert knowledge of ideas for alternate designs and advances in theoretical aspects. The dynamical

behavior of recurrent neural networks is useful for solving problems in science, engineering, and business. This approach will yield huge advances in the coming years. Recurrent Neural Networks illuminates the opportunities and provides you with a broad view of the current events in this rich field.

Discover powerful ways to effectively solve real-world machine learning problems using key libraries including scikit-learn, TensorFlow, and PyTorch Key Features Learn and implement machine learning algorithms in a variety of real-life scenarios Cover a range of tasks catering to supervised, unsupervised and reinforcement learning techniques Find easy-to-follow code solutions for tackling common and not-so-common challenges Book Description This eagerly anticipated second edition of the popular Python Machine Learning Cookbook will enable you to adopt a fresh approach to dealing with real-world machine learning and deep learning tasks. With the help of over 100 recipes, you will learn to build powerful machine learning applications using modern libraries from the Python ecosystem. The book will also guide you on how to implement various machine learning algorithms for classification, clustering, and recommendation engines, using a recipe-based approach. With emphasis on practical solutions, dedicated sections in the book will help you to apply supervised and unsupervised learning techniques to real-world problems. Toward the concluding chapters, you will get to grips with recipes that teach you advanced techniques including reinforcement learning, deep neural networks, and automated machine learning. By the end of this book, you will be equipped with the skills you need to apply machine learning techniques and leverage the full capabilities of the Python ecosystem through real-world examples. What you will learn Use predictive modeling and apply it to real-world problems Explore data visualization techniques to

interact with your data Learn how to build a recommendation engine Understand how to interact with text data and build models to analyze it Work with speech data and recognize spoken words using Hidden Markov Models Get well versed with reinforcement learning, automated ML, and transfer learning Work with image data and build systems for image recognition and biometric face recognition Use deep neural networks to build an optical character recognition system Who this book is for This book is for data scientists, machine learning developers, deep learning enthusiasts and Python programmers who want to solve real-world challenges using machine-learning techniques and algorithms. If you are facing challenges at work and want ready-to-use code solutions to cover key tasks in machine learning and the deep learning domain, then this book is what you need. Familiarity with Python programming and machine learning concepts will be useful.

Summary Natural Language Processing in Action is your guide to creating machines that understand human language using the power of Python with its ecosystem of packages dedicated to NLP and AI. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Recent advances in deep learning empower applications to understand text and speech with extreme accuracy. The result? Chatbots that can imitate real people, meaningful resume-to-job matches, superb predictive search, and automatically generated document summaries—all at a low cost. New techniques, along with accessible tools like Keras and TensorFlow, make professional-quality NLP easier than ever before. About the Book Natural Language Processing in Action is your guide to building machines that can read and interpret human language. In it, you'll use readily available Python packages to capture the meaning in text and react accordingly. The book

expands traditional NLP approaches to include neural networks, modern deep learning algorithms, and generative techniques as you tackle real-world problems like extracting dates and names, composing text, and answering free-form questions. What's inside Some sentences in this book were written by NLP! Can you guess which ones? Working with Keras, TensorFlow, gensim, and scikit-learn Rule-based and data-based NLP Scalable pipelines About the Reader This book requires a basic understanding of deep learning and intermediate Python skills. About the Author Hobson Lane, Cole Howard, and Hannes Max Hapke are experienced NLP engineers who use these techniques in production. Table of Contents PART 1 - WORDY MACHINES Packets of thought (NLP overview) Build your vocabulary (word tokenization) Math with words (TF-IDF vectors) Finding meaning in word counts (semantic analysis) PART 2 - DEEPER LEARNING (NEURAL NETWORKS) Baby steps with neural networks (perceptrons and backpropagation) Reasoning with word vectors (Word2vec) Getting words in order with convolutional neural networks (CNNs) Loopy (recurrent) neural networks (RNNs) Improving retention with long short-term memory networks Sequence-to-sequence models and attention PART 3 - GETTING REAL (REAL-WORLD NLP CHALLENGES) Information extraction (named entity extraction and question answering) Getting chatty (dialog engines) Scaling up (optimization, parallelization, and batch processing)

Explore machine learning concepts using the latest numerical computing library — TensorFlow — with the help of this comprehensive cookbook About This Book Your quick guide to implementing TensorFlow in your day-to-day machine learning activities Learn advanced techniques that bring more accuracy and speed to machine learning Upgrade your knowledge to the second generation of machine learning with this guide on TensorFlow Who This Book Is

For This book is ideal for data scientists who are familiar with C++ or Python and perform machine learning activities on a day-to-day basis. Intermediate and advanced machine learning implementers who need a quick guide they can easily navigate will find it useful. What You Will Learn Become familiar with the basics of the TensorFlow machine learning library Get to know Linear Regression techniques with TensorFlow Learn SVMs with hands-on recipes Implement neural networks and improve predictions Apply NLP and sentiment analysis to your data Master CNN and RNN through practical recipes Take TensorFlow into production In Detail TensorFlow is an open source software library for Machine Intelligence. The independent recipes in this book will teach you how to use TensorFlow for complex data computations and will let you dig deeper and gain more insights into your data than ever before. You'll work through recipes on training models, model evaluation, sentiment analysis, regression analysis, clustering analysis, artificial neural networks, and deep learning – each using Google's machine learning library TensorFlow. This guide starts with the fundamentals of the TensorFlow library which includes variables, matrices, and various data sources. Moving ahead, you will get hands-on experience with Linear Regression techniques with TensorFlow. The next chapters cover important high-level concepts such as neural networks, CNN, RNN, and NLP. Once you are familiar and comfortable with the TensorFlow ecosystem, the last chapter will show you how to take it to production. Style and approach This book takes a recipe-based approach where every topic is explicated with the help of a real-world example. Supervised sequence labelling is a vital area of machine learning, encompassing tasks such as speech, handwriting and gesture recognition, protein secondary structure prediction and part-of-speech tagging. Recurrent neural networks are powerful sequence learning

tools—robust to input noise and distortion, able to exploit long-range contextual information—that would seem ideally suited to such problems. However their role in large-scale sequence labelling systems has so far been auxiliary. The goal of this book is a complete framework for classifying and transcribing sequential data with recurrent neural networks only. Three main innovations are introduced in order to realise this goal. Firstly, the connectionist temporal classification output layer allows the framework to be trained with unsegmented target sequences, such as phoneme-level speech transcriptions; this is in contrast to previous connectionist approaches, which were dependent on error-prone prior segmentation. Secondly, multidimensional recurrent neural networks extend the framework in a natural way to data with more than one spatio-temporal dimension, such as images and videos. Thirdly, the use of hierarchical subsampling makes it feasible to apply the framework to very large or high resolution sequences, such as raw audio or video. Experimental validation is provided by state-of-the-art results in speech and handwriting recognition.
Deep Learning in Natural Language ProcessingSpringer
Summary Machine Learning in Action is unique book that blends the foundational theories of machine learning with the practical realities of building tools for everyday data analysis. You'll use the flexible Python programming language to build programs that implement algorithms for data classification, forecasting, recommendations, and higher-level features like summarization and simplification. About the Book A machine is said to learn when its performance improves with experience. Learning requires algorithms and programs that capture data and ferret out the interestingor useful patterns. Once the specialized domain of analysts and mathematicians, machine learning is becoming a skill needed by many. Machine Learning in Action is a clearly

written tutorial for developers. It avoids academic language and takes you straight to the techniques you'll use in your day-to-day work. Many (Python) examples present the core algorithms of statistical data processing, data analysis, and data visualization in code you can reuse. You'll understand the concepts and how they fit in with tactical tasks like classification, forecasting, recommendations, and higher-level features like summarization and simplification. Readers need no prior experience with machine learning or statistical processing. Familiarity with Python is helpful. Purchase of the print book comes with an offer of a free PDF, ePub, and Kindle eBook from Manning. Also available is all code from the book. What's Inside A no-nonsense introduction Examples showing common ML tasks Everyday data analysis Implementing classic algorithms like Apriori and Adaboos Table of Contents PART 1 CLASSIFICATION Machine learning basics Classifying with k-Nearest Neighbors Splitting datasets one feature at a time: decision trees Classifying with probability theory: naïve Bayes Logistic regression Support vector machines Improving classification with the AdaBoost meta algorithm PART 2 FORECASTING NUMERIC VALUES WITH REGRESSION Predicting numeric values: regression Tree-based regression PART 3 UNSUPERVISED LEARNING Grouping unlabeled items using k-means clustering Association analysis with the Apriori algorithm Efficiently finding frequent itemsets with FP-growth PART 4 ADDITIONAL TOOLS Using principal component analysis to simplify data Simplifying data with the singular value decomposition Big data and MapReduce

New edition of the bestselling guide to deep reinforcement learning and how it's used to solve complex real-world problems. Revised and expanded to include multi-agent methods, discrete optimization, RL in robotics, advanced exploration techniques, and more Key Features Second

edition of the bestselling introduction to deep reinforcement learning, expanded with six new chapters Learn advanced exploration techniques including noisy networks, pseudo-count, and network distillation methods Apply RL methods to cheap hardware robotics platforms Book Description Deep Reinforcement Learning Hands-On, Second Edition is an updated and expanded version of the bestselling guide to the very latest reinforcement learning (RL) tools and techniques. It provides you with an introduction to the fundamentals of RL, along with the hands-on ability to code intelligent learning agents to perform a range of practical tasks. With six new chapters devoted to a variety of up-to-the-minute developments in RL, including discrete optimization (solving the Rubik's Cube), multi-agent methods, Microsoft's TextWorld environment, advanced exploration techniques, and more, you will come away from this book with a deep understanding of the latest innovations in this emerging field. In addition, you will gain actionable insights into such topic areas as deep Q-networks, policy gradient methods, continuous control problems, and highly scalable, non-gradient methods. You will also discover how to build a real hardware robot trained with RL for less than $100 and solve the Pong environment in just 30 minutes of training using step-by-step code optimization. In short, Deep Reinforcement Learning Hands-On, Second Edition, is your companion to navigating the exciting complexities of RL as it helps you attain experience and knowledge through real-world examples. What you will learn Understand the deep learning context of RL and implement complex deep learning models Evaluate RL methods including cross-entropy, DQN, actor-critic, TRPO, PPO, DDPG, D4PG, and others Build a practical hardware robot trained with RL methods for less than $100 Discover Microsoft's TextWorld environment, which is an interactive fiction games platform Use discrete optimization in RL to solve a Rubik's Cube

Teach your agent to play Connect 4 using AlphaGo Zero Explore the very latest deep RL research on topics including AI chatbots Discover advanced exploration techniques, including noisy networks and network distillation techniques Who this book is for Some fluency in Python is assumed. Sound understanding of the fundamentals of deep learning will be helpful. This book is an introduction to deep RL and requires no background in RL

This book features selected high-quality research papers presented at the International Conference on Machine Intelligence and Signal Processing (MISP 2019), held at the Indian Institute of Technology, Allahabad, India, on September 7–10, 2019. The book covers the latest advances in the fields of machine learning, big data analytics, signal processing, computational learning theory, and their real-time applications. The topics covered include support vector machines (SVM) and variants like least-squares SVM (LS-SVM) and twin SVM (TWSVM), extreme learning machine (ELM), artificial neural network (ANN), and other areas in machine learning. Further, it discusses the real-time challenges involved in processing big data and adapting the algorithms dynamically to improve the computational efficiency. Lastly, it describes recent developments in processing signals, for instance, signals generated from IoT devices, smart systems, speech, and videos and addresses biomedical signal processing: electrocardiogram (ECG) and electroencephalogram (EEG).

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.

Deep learning methods are achieving state-of-the-art results on challenging machine learning problems such as describing photos and translating text from one language to another. In this new laser-focused Ebook, finally cut through the math, research papers and patchwork descriptions about natural language processing. Using clear explanations, standard Python libraries and step-by-step tutorial lessons you will discover what natural language processing is, the promise of deep learning in the field, how to clean and prepare text data for modeling, and how to develop deep learning

models for your own natural language processing projects.

This book gathers a collection of high-quality peer-reviewed research papers presented at the 2nd International Conference on Data and Information Sciences (ICDIS 2019), held at Raja Balwant Singh Engineering Technical Campus, Agra, India, on March 29–30, 2019. In chapters written by leading researchers, developers, and practitioner from academia and industry, it covers virtually all aspects of computational sciences and information security, including central topics like artificial intelligence, cloud computing, and big data. Highlighting the latest developments and technical solutions, it will show readers from the computer industry how to capitalize on key advances in next-generation computer and communication technology.

Master TensorFlow to create powerful machine learning algorithms, with valuable insights on Keras, Boosted Trees, Tabular Data, Transformers, Reinforcement Learning and more Key Features Work with the latest code and examples for TensorFlow 2 Get to grips with the fundamentals including variables, matrices, and data sources Learn advanced deep learning techniques to make your algorithms faster and more accurate Book Description The independent recipes in the Machine Learning Using TensorFlow Cookbook will teach you how to perform complex data computations and gain valuable insights into your data. You will work through recipes on training models, model evaluation, sentiment analysis, regression analysis, artificial neural networks, and deep learning - each using Google's machine learning library, TensorFlow. This cookbook

begins by introducing you to the fundamentals of the TensorFlow library, including variables, matrices, and various data sources. You'll then take a deep dive into some real-world implementations of Keras and TensorFlow and learn how to use estimators to train linear models and boosted trees, both for classification and for regression to provide a baseline for tabular data problems. As you progress, you'll explore the practical applications of a variety of deep learning architectures, such as recurrent neural networks and Transformers, and see how they can be applied to computer vision and natural language processing (NLP) problems. Once you are familiar with the TensorFlow ecosystem, the final chapter will teach you how to take a project to production. By the end of this machine learning book, you will be proficient in using TensorFlow 2. You'll also understand deep learning from the fundamentals and be able to implement machine learning algorithms in real-world scenarios. What You Will Learn Grasp Linear Regression techniques with TensorFlow Use Estimators to train linear models and boosted trees for classification or regression Execute neural networks and improve predictions on tabular data Master convolutional neural networks and recurrent neural networks through practical recipes Apply reinforcement learning algorithms using the TF-agents framework Implement and fine-tune Transformer models for various NLP tasks Take TensorFlow into production Who this book is for If you are a data scientist or a machine learning engineer, and you want to skip detailed theoretical explanations in favor of building production-ready machine learning models using TensorFlow, this

book is for you. Basic familiarity with Python, linear algebra, statistics, and machine learning is necessary to make the most out of this book.

Generative modeling is one of the hottest topics in AI. It's now possible to teach a machine to excel at human endeavors such as painting, writing, and composing music. With this practical book, machine-learning engineers and data scientists will discover how to re-create some of the most impressive examples of generative deep learning models, such as variational autoencoders,generative adversarial networks (GANs), encoder-decoder models and world models. Author David Foster demonstrates the inner workings of each technique, starting with the basics of deep learning before advancing to some of the most cutting-edge algorithms in the field. Through tips and tricks, you'll understand how to make your models learn more efficiently and become more creative. Discover how variational autoencoders can change facial expressions in photos Build practical GAN examples from scratch, including CycleGAN for style transfer and MuseGAN for music generation Create recurrent generative models for text generation and learn how to improve the models using attention Understand how generative models can help agents to accomplish tasks within a reinforcement learning setting Explore the architecture of the Transformer (BERT, GPT-2) and image generation models such as ProGAN and StyleGAN

Sentiment analysis is a branch of natural language processing concerned with the study of the intensity of the emotions expressed in a piece of text. The automated

analysis of the multitude of messages delivered through social media is one of the hottest research fields, both in academy and in industry, due to its extremely high potential applicability in many different domains. This Special Issue describes both technological contributions to the field, mostly based on deep learning techniques, and specific applications in areas like health insurance, gender classification, recommender systems, and cyber aggression detection.

Roughly inspired by the human brain, deep neural networks trained with large amounts of data can solve complex tasks with unprecedented accuracy. This practical book provides an end-to-end guide to TensorFlow, the leading open source software library that helps you build and train neural networks for computer vision, natural language processing (NLP), speech recognition, and general predictive analytics. Authors Tom Hope, Yehezkel Resheff, and Itay Lieder provide a hands-on approach to TensorFlow fundamentals for a broad technical audience—from data scientists and engineers to students and researchers. You'll begin by working through some basic examples in TensorFlow before diving deeper into topics such as neural network architectures, TensorBoard visualization, TensorFlow abstraction libraries, and multithreaded input pipelines. Once you finish this book, you'll know how to build and deploy production-ready deep learning systems in TensorFlow. Get up and running with TensorFlow, rapidly and painlessly Learn how to use TensorFlow to build deep learning models from the ground up Train popular deep learning models for computer vision and NLP Use

extensive abstraction libraries to make development easier and faster Learn how to scale TensorFlow, and use clusters to distribute model training Deploy TensorFlow in a production setting

Dependency-based methods for syntactic parsing have become increasingly popular in natural language processing in recent years. This book gives a thorough introduction to the methods that are most widely used today. After an introduction to dependency grammar and dependency parsing, followed by a formal characterization of the dependency parsing problem, the book surveys the three major classes of parsing models that are in current use: transition-based, graph-based, and grammar-based models. It continues with a chapter on evaluation and one on the comparison of different methods, and it closes with a few words on current trends and future prospects of dependency parsing. The book presupposes a knowledge of basic concepts in linguistics and computer science, as well as some knowledge of parsing methods for constituency-based representations. Table of Contents: Introduction / Dependency Parsing / Transition-Based Parsing / Graph-Based Parsing / Grammar-Based Parsing / Evaluation / Comparison / Final Thoughts

This book gathers the proceedings of the 5th International Conference on the Industry 4.0 Model for Advanced Manufacturing (AMP 2020), held in Belgrade, Serbia, on 1–4 June 2020. The event marks the latest in a series of high-level conferences that bring together experts from academia and industry to exchange knowledge, ideas,

experiences, research findings, and information in the field of manufacturing. The book addresses a wide range of topics, including: design of smart and intelligent products, developments in CAD/CAM technologies, rapid prototyping and reverse engineering, multistage manufacturing processes, manufacturing automation in the Industry 4.0 model, cloud-based products, and cyber-physical and reconfigurable manufacturing systems. By providing updates on key issues and highlighting recent advances in manufacturing engineering and technologies, the book supports the transfer of vital knowledge to the next generation of academics and practitioners. Further, it will appeal to anyone working or conducting research in this rapidly evolving field.
Engaging projects that will teach you how complex data can be exploited to gain the most insightAbout This Book- Bored of too much theory on TensorFlow? This book is what you need! Thirteen solid projects and four examples teach you how to implement TensorFlow in production.- This example-rich guide teaches you how to perform highly accurate and efficient numerical computing with TensorFlow- It is a practical and methodically explained guide that allows you to apply Tensorflow's features from the very beginning.Who This Book Is ForThis book is for data analysts, data scientists, and researchers who want to increase the speed and efficiency of their machine learning activities and results. Anyone looking for a fresh guide to complex numerical computations with TensorFlow will

find this an extremely helpful resource. This book is also for developers who want to implement TensorFlow in production in various scenarios. Some experience with C++ and Python is expected.What You Will Learn- Load, interact, dissect, process, and save complex datasets- Solve classification and regression problems using state of the art techniques - Predict the outcome of a simple time series using Linear Regression modeling- Use a Logistic Regression scheme to predict the future result of a time series- Classify images using deep neural network schemes- Tag a set of images and detect features using a deep neural network, including a Convolutional Neural Network (CNN) layer- Resolve character recognition problems using the Recurrent Neural Network (RNN) modelIn DetailThis book of projects highlights how TensorFlow can be used in different scenarios - this includes projects for training models, machine learning, deep learning, and working with various neural networks. Each project provides exciting and insightful exercises that will teach you how to use TensorFlow and show you how layers of data can be explored by working with Tensors. Simply pick a project that is in line with your environment and get stacks of information on how to implement TensorFlow in production.Style and approachThis book is a practical guide to implementing TensorFlow in production. It explores various scenarios in which you could use TensorFlow and shows you how to use it in the

context of real world projects. This will not only give you an upper hand in the field, but shows the potential for innovative uses of TensorFlow in your environment. This guide opens the door to second generation machine learning and numerical computation - a must-have for your bookshelf!
This practical guide will teach you how deep learning (DL) can be used to solve complex real-world problems. Key Features Explore deep reinforcement learning (RL), from the first principles to the latest algorithms Evaluate high-profile RL methods, including value iteration, deep Q-networks, policy gradients, TRPO, PPO, DDPG, D4PG, evolution strategies and genetic algorithms Keep up with the very latest industry developments, including AI-driven chatbots Book Description Recent developments in reinforcement learning (RL), combined with deep learning (DL), have seen unprecedented progress made towards training agents to solve complex problems in a human-like way. Google's use of algorithms to play and defeat the well-known Atari arcade games has propelled the field to prominence, and researchers are generating new ideas at a rapid pace. Deep Reinforcement Learning Hands-On is a comprehensive guide to the very latest DL tools and their limitations. You will evaluate methods including Cross-entropy and policy gradients, before applying them to real-world environments. Take on both the Atari set of virtual games and family favorites

such as Connect4. The book provides an introduction to the basics of RL, giving you the know-how to code intelligent learning agents to take on a formidable array of practical tasks. Discover how to implement Q-learning on 'grid world' environments, teach your agent to buy and trade stocks, and find out how natural language models are driving the boom in chatbots. What you will learn Understand the DL context of RL and implement complex DL models Learn the foundation of RL: Markov decision processes Evaluate RL methods including Cross-entropy, DQN, Actor-Critic, TRPO, PPO, DDPG, D4PG and others Discover how to deal with discrete and continuous action spaces in various environments Defeat Atari arcade games using the value iteration method Create your own OpenAI Gym environment to train a stock trading agent Teach your agent to play Connect4 using AlphaGo Zero Explore the very latest deep RL research on topics including AI-driven chatbots Who this book is for Some fluency in Python is assumed. Basic deep learning (DL) approaches should be familiar to readers and some practical experience in DL will be helpful. This book is an introduction to deep reinforcement learning (RL) and requires no background in RL.

Statistical approaches to processing natural language text have become dominant in recent years. This foundational text is the first comprehensive

introduction to statistical natural language processing (NLP) to appear. The book contains all the theory and algorithms needed for building NLP tools. It provides broad but rigorous coverage of mathematical and linguistic foundations, as well as detailed discussion of statistical methods, allowing students and researchers to construct their own implementations. The book covers collocation finding, word sense disambiguation, probabilistic parsing, information retrieval, and other applications.

Get up and running with the latest numerical computing library by Google and dive deeper into your data!About This Book- Get the first book on the market that shows you the key aspects TensorFlow, how it works, and how to use it for the second generation of machine learning- Want to perform faster and more accurate computations in the field of data science? This book will acquaint you with an all-new refreshing library-TensorFlow!- Dive into the next generation of numerical computing and get the most out of your data with this quick guideWho This Book Is ForThis book is dedicated to all the machine learning and deep learning enthusiasts, data scientists, researchers, and even students who want to perform more accurate, fast machine learning operations with TensorFlow. Those with basic knowledge of programming (Python and C/C++) and math concepts who want to be introduced to the topics of machine learning will find this book

useful.What You Will Learn- Install and adopt TensorFlow in your Python environment to solve mathematical problems- Get to know the basic machine and deep learning concepts- Train and test neural networks to fit your data model- Make predictions using regression algorithms- Analyze your data with a clustering procedure- Develop algorithms for clustering and data classification- Use GPU computing to analyze big dataIn DetailGoogle's TensorFlow engine, after much fanfare, has evolved in to a robust, user-friendly, and customizable, application-grade software library of machine learning (ML) code for numerical computation and neural networks.This book takes you through the practical software implementation of various machine learning techniques with TensorFlow. In the first few chapters, you'll gain familiarity with the framework and perform the mathematical operations required for data analysis. As you progress further, you'll learn to implement various machine learning techniques such as classification, clustering, neural networks, and deep learning through practical examples.By the end of this book, you'll have gained hands-on experience of using TensorFlow and building classification, image recognition systems, language processing, and information retrieving systems for your application.Style and approachGet quickly up and running with TensorFlow using this fast-paced guide. You will get to know everything that can be done with

TensorFlow and we'll show you how to implement it in your environment. The examples in the book are from the core of the computation industry-something you can connect to and will find familiar.

The purpose of this book is to help to spread TensorFlow knowledge among engineers who want to expand their wisdom in the exciting world of Machine Learning. We believe that anyone with an engineering background might require from now on Deep Learning, an

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