

Distributed Deep Learning Framework Over Spark

Romeo Kienzler, Md. Rezaul Karim, Sridhar Alla, Siamak Amirghodsi, Meenakshi Rajendran, Broderick Hall, Shuen Mei

Hands-On Deep Learning with Apache Spark Guglielmo Iozzia, 2019-01-31 Speed up the design and implementation of deep learning solutions using Apache Spark Key Features Explore the world of distributed deep learning with Apache Spark Train neural networks with deep learning libraries such as BigDL and TensorFlow Develop Spark deep learning applications to intelligently handle large and complex datasets Book Description Deep learning is a subset of machine learning where datasets with several layers of complexity can be processed. Hands-On Deep Learning with Apache Spark addresses the sheer complexity of technical and analytical parts and the speed at which deep learning solutions can be implemented on Apache Spark. The book starts with the fundamentals of Apache Spark and deep learning. You will set up Spark for deep learning, learn principles of distributed modeling, and understand different types of neural nets. You will then implement deep learning models, such as convolutional neural networks (CNNs), recurrent neural networks (RNNs), and long short-term memory (LSTM) on Spark. As you progress through the book, you will gain hands-on experience of what it takes to understand the complex datasets you are dealing with. During the course of this book, you will use popular deep learning frameworks, such as TensorFlow, Deeplearning4j, and Keras to train your distributed models. By the end of this book, you'll have gained experience with the implementation of your models on a variety of use cases. What you will learn Understand the basics of deep learning Set up Apache Spark for deep learning Understand the principles of distribution modeling and different types of neural networks Obtain an understanding of deep learning algorithms Discover textual analysis and deep learning with Spark Use popular deep learning frameworks, such as Deeplearning4j, TensorFlow, and Keras Explore popular deep learning algorithms Who this book is for If you are a Scala developer, data scientist, or data analyst who wants to learn how to use Spark for implementing efficient deep learning models, Hands-On Deep Learning with Apache Spark is for you. Knowledge of the core machine learning concepts and some exposure to Spark will be helpful.

Next-Generation Machine Learning with Spark Butch Quinto, 2020-02-22 Access real-world documentation and examples for the Spark platform for building large-scale, enterprise-grade machine learning applications. The past decade has seen an astonishing series of advances in machine learning. These breakthroughs are disrupting our everyday life and making an

impact across every industry. Next-Generation Machine Learning with Spark provides a gentle introduction to Spark and Spark MLlib and advances to more powerful, third-party machine learning algorithms and libraries beyond what is available in the standard Spark MLlib library. By the end of this book, you will be able to apply your knowledge to real-world use cases through dozens of practical examples and insightful explanations. What You Will Learn Be introduced to machine learning, Spark, and Spark MLlib 2.4.x Achieve lightning-fast gradient boosting on Spark with the XGBoost4J-Spark and LightGBM libraries Detect anomalies with the Isolation Forest algorithm for Spark Use the Spark NLP and Stanford CoreNLP libraries that support multiple languages Optimize your ML workload with the Alluxio in-memory data accelerator for Spark Use GraphX and GraphFrames for Graph Analysis Perform image recognition using convolutional neural networks Utilize the Keras framework and distributed deep learning libraries with Spark Who This Book Is For Data scientists and machine learning engineers who want to take their knowledge to the next level and use Spark and more powerful, next-generation algorithms and libraries beyond what is available in the standard Spark MLlib library; also serves as a primer for aspiring data scientists and engineers who need an introduction to machine learning, Spark, and Spark MLlib.

Apache Spark Deep Learning Cookbook Ahmed Sherif, Amrith Ravindra, 2018-07-13 A solution-based guide to put your deep learning models into production with the power of Apache Spark Key Features Discover practical recipes for distributed deep learning with Apache Spark Learn to use libraries such as Keras and TensorFlow Solve problems in order to train your deep learning models on Apache Spark Book Description With deep learning gaining rapid mainstream adoption in modern-day industries, organizations are looking for ways to unite popular big data tools with highly efficient deep learning libraries. As a result, this will help deep learning models train with higher efficiency and speed. With the help of the Apache Spark Deep Learning Cookbook, you'll work through specific recipes to generate outcomes for deep learning algorithms, without getting bogged down in theory. From setting up Apache Spark for deep learning to implementing types of neural net, this book tackles both common and not so common problems to perform deep learning on a distributed environment. In addition to this, you'll get access to deep learning code within Spark that can be reused to answer similar problems or tweaked to answer slightly different problems. You will also learn how to stream and cluster your data with Spark. Once you have got to grips with the basics, you'll explore how to implement and deploy deep learning models, such as Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN) in Spark, using popular libraries such as TensorFlow and Keras. By the end of the book, you'll have the expertise to train and deploy efficient deep learning models on Apache Spark. What you will learn Set up a fully functional Spark environment Understand practical machine learning and deep learning concepts Apply built-in machine learning libraries within Spark Explore libraries that are compatible with TensorFlow and Keras Explore NLP models such as Word2vec and TF-IDF on Spark Organize dataframes for deep learning evaluation Apply testing and training modeling to ensure accuracy Access readily available code that may be reusable Who this book is for If you're

looking for a practical and highly useful resource for implementing efficiently distributed deep learning models with Apache Spark, then the Apache Spark Deep Learning Cookbook is for you. Knowledge of the core machine learning concepts and a basic understanding of the Apache Spark framework is required to get the best out of this book. Additionally, some programming knowledge in Python is a plus.

Scaling Machine Learning with Spark Adi Polak,2023-03-07 Learn how to build end-to-end scalable machine learning solutions with Apache Spark. With this practical guide, author Adi Polak introduces data and ML practitioners to creative solutions that supersede today's traditional methods. You'll learn a more holistic approach that takes you beyond specific requirements and organizational goals--allowing data and ML practitioners to collaborate and understand each other better. Scaling Machine Learning with Spark examines several technologies for building end-to-end distributed ML workflows based on the Apache Spark ecosystem with Spark MLlib, MLflow, TensorFlow, and PyTorch. If you're a data scientist who works with machine learning, this book shows you when and why to use each technology. You will: Explore machine learning, including distributed computing concepts and terminology Manage the ML lifecycle with MLflow Ingest data and perform basic preprocessing with Spark Explore feature engineering, and use Spark to extract features Train a model with MLlib and build a pipeline to reproduce it Build a data system to combine the power of Spark with deep learning Get a step-by-step example of working with distributed TensorFlow Use PyTorch to scale machine learning and its internal architecture

Deep Learning with Hadoop Dipayan Dev,2017-02-20 Build, implement and scale distributed deep learning models for large-scale datasets About This Book Get to grips with the deep learning concepts and set up Hadoop to put them to use Implement and parallelize deep learning models on Hadoop's YARN framework A comprehensive tutorial to distributed deep learning with Hadoop Who This Book Is For If you are a data scientist who wants to learn how to perform deep learning on Hadoop, this is the book for you. Knowledge of the basic machine learning concepts and some understanding of Hadoop is required to make the best use of this book. What You Will Learn Explore Deep Learning and various models associated with it Understand the challenges of implementing distributed deep learning with Hadoop and how to overcome it Implement Convolutional Neural Network (CNN) with deeplearning4j Delve into the implementation of Restricted Boltzmann Machines (RBM) Understand the mathematical explanation for implementing Recurrent Neural Networks (RNN) Get hands on practice of deep learning and their implementation with Hadoop. In Detail This book will teach you how to deploy large-scale dataset in deep neural networks with Hadoop for optimal performance. Starting with understanding what deep learning is, and what the various models associated with deep neural networks are, this book will then show you how to set up the Hadoop environment for deep learning. In this book, you will also learn how to overcome the challenges that you face while implementing distributed deep learning with large-scale unstructured datasets. The book will also show you how you can implement and parallelize the widely used deep learning models such as Deep Belief Networks, Convolutional Neural

Networks, Recurrent Neural Networks, Restricted Boltzmann Machines and autoencoder using the popular deep learning library deeplearning4j. Get in-depth mathematical explanations and visual representations to help you understand the design and implementations of Recurrent Neural network and Denoising AutoEncoders with deeplearning4j. To give you a more practical perspective, the book will also teach you the implementation of large-scale video processing, image processing and natural language processing on Hadoop. By the end of this book, you will know how to deploy various deep neural networks in distributed systems using Hadoop. Style and approach This book takes a comprehensive, step-by-step approach to implement efficient deep learning models on Hadoop. It starts from the basics and builds the readers' knowledge as they strengthen their understanding of the concepts. Practical examples are included in every step of the way to supplement the theory.

Practical Machine Learning with Spark Gourav Gupta, Manish Gupta, Inder Singh Gupta, 2022-10-17 Explore the cosmic secrets of Distributed Processing for Deep Learning applications. **KEY FEATURES** ● In-depth practical demonstration of ML/DL concepts using Distributed Framework. ● Covers graphical illustrations and visual explanations for ML/DL pipelines. ● Includes live codebase for each of NLP, computer vision and machine learning applications. **DESCRIPTION** This book provides the reader with an up-to-date explanation of Machine Learning and an in-depth, comprehensive, and straightforward understanding of the architectural techniques used to evaluate and anticipate the futuristic insights of data using Apache Spark. The book walks readers by setting up Hadoop and Spark installations on-premises, Docker, and AWS. Readers will learn about Spark MLib and how to utilize it in supervised and unsupervised machine learning scenarios. With the help of Spark, some of the most prominent technologies, such as natural language processing and computer vision, are evaluated and demonstrated in a realistic setting. Using the capabilities of Apache Spark, this book discusses the fundamental components that underlie each of these natural language processing, computer vision, and machine learning technologies, as well as how you can incorporate these technologies into your business processes. Towards the end of the book, readers will learn about several deep learning frameworks, such as TensorFlow and PyTorch. Readers will also learn to execute distributed processing of deep learning problems using the Spark programming language. **WHAT YOU WILL LEARN** ● Learn how to get started with machine learning projects using Spark. ● Witness how to use Spark MLib's design for machine learning and deep learning operations. ● Use Spark in tasks involving NLP, unsupervised learning, and computer vision. ● Experiment with Spark in a cloud environment and with AI pipeline workflows. ● Run deep learning applications on a distributed network. **WHO THIS BOOK IS FOR** This book is valuable for data engineers, machine learning engineers, data scientists, data architects, business analysts, and technical consultants worldwide. It would be beneficial to have some familiarity with the fundamentals of Hadoop and Python.

Distributed Deep Learning with Apache Spark Tomasz Lelek, 2019 Deep learning is a subfield of Artificial Intelligence and

Machine Learning where a huge amount of data is processed in complex layers of neural networks. It has solved tons of interesting real-world problems in recent years. Distributed deep learning (DL) involves training a deep neural network in parallel across multiple machines. In this course, you will get started with implementing Deep Learning solutions easily with the help of Apache Spark. You will begin with a short introduction on Deep Learning and Apache Spark and the principles of distributed modeling. With the help of real-world examples, you will investigate different types of neural network and work with DL libraries such as BigDL, Deeplearning4j, and the Deep Learning pipelines library to implement DL models and distributed computing on Spark. You will see how you can easily use a large dataset to implement efficient DL solutions to simplify real-world examples. You will also learn how to distribute the computationally heavy parts of DL into processes with the help of Apache Spark. By the end of this course, you'll have gained experience in implementing Distributed Deep Learning for your models at work. Our examples will be based on real-world problems from the banking industry.--Resource description page.

Practical Machine Learning with Spark Gourav Gupta,Dr. Manish Gupta,Dr. Inder Singh Gupta,2022-04-28 Explore the cosmic secrets of Distributed Processing for Deep Learning applications KEY FEATURES ● In-depth practical demonstration of ML/DL concepts using Distributed Framework. ● Covers graphical illustrations and visual explanations for ML/DL pipelines. ● Includes live codebase for each of NLP, computer vision and machine learning applications. DESCRIPTION This book provides the reader with an up-to-date explanation of Machine Learning and an in-depth, comprehensive, and straightforward understanding of the architectural techniques used to evaluate and anticipate the futuristic insights of data using Apache Spark. The book walks readers by setting up Hadoop and Spark installations on-premises, Docker, and AWS. Readers will learn about Spark MLib and how to utilize it in supervised and unsupervised machine learning scenarios. With the help of Spark, some of the most prominent technologies, such as natural language processing and computer vision, are evaluated and demonstrated in a realistic setting. Using the capabilities of Apache Spark, this book discusses the fundamental components that underlie each of these natural language processing, computer vision, and machine learning technologies, as well as how you can incorporate these technologies into your business processes. Towards the end of the book, readers will learn about several deep learning frameworks, such as TensorFlow and PyTorch. Readers will also learn to execute distributed processing of deep learning problems using the Spark programming language WHAT YOU WILL LEARN ●Learn how to get started with machine learning projects using Spark. ● Witness how to use Spark MLib's design for machine learning and deep learning operations. ● Use Spark in tasks involving NLP, unsupervised learning, and computer vision. ● Experiment with Spark in a cloud environment and with AI pipeline workflows. ● Run deep learning applications on a distributed network. WHO THIS BOOK IS FOR This book is valuable for data engineers, machine learning engineers, data scientists, data architects, business analysts, and technical consultants worldwide. It would be beneficial to have some

familiarity with the fundamentals of Hadoop and Python. TABLE OF CONTENTS 1. Introduction to Machine Learning 2. Apache Spark Environment Setup and Configuration 3. Apache Spark 4. Apache Spark MLlib 5. Supervised Learning with Spark 6. Un-Supervised Learning with Apache Spark 7. Natural Language Processing with Apache Spark 8. Recommendation Engine with Distributed Framework 9. Deep Learning with Spark 10. Computer Vision with Apache Spark

Apache Spark 2: Data Processing and Real-Time Analytics Romeo Kienzler, Md. Rezaul Karim, Sridhar Alla, Siamak Amirghodsi, Meenakshi Rajendran, Broderick Hall, Shuen Mei, 2018-12-21 Build efficient data flow and machine learning programs with this flexible, multi-functional open-source cluster-computing framework Key Features Master the art of real-time big data processing and machine learning Explore a wide range of use-cases to analyze large data Discover ways to optimize your work by using many features of Spark 2.x and Scala Book Description Apache Spark is an in-memory, cluster-based data processing system that provides a wide range of functionalities such as big data processing, analytics, machine learning, and more. With this Learning Path, you can take your knowledge of Apache Spark to the next level by learning how to expand Spark's functionality and building your own data flow and machine learning programs on this platform. You will work with the different modules in Apache Spark, such as interactive querying with Spark SQL, using DataFrames and datasets, implementing streaming analytics with Spark Streaming, and applying machine learning and deep learning techniques on Spark using MLlib and various external tools. By the end of this elaborately designed Learning Path, you will have all the knowledge you need to master Apache Spark, and build your own big data processing and analytics pipeline quickly and without any hassle. This Learning Path includes content from the following Packt products: *Mastering Apache Spark 2.x* by Romeo Kienzler *Scala and Spark for Big Data Analytics* by Md. Rezaul Karim, Sridhar Alla *Apache Spark 2.x Machine Learning Cookbook* by Siamak Amirghodsi, Meenakshi Rajendran, Broderick Hall, Shuen Mei *Cookbook* What you will learn Get to grips with all the features of Apache Spark 2.x Perform highly optimized real-time big data processing Use ML and DL techniques with Spark MLlib and third-party tools Analyze structured and unstructured data using SparkSQL and GraphX Understand tuning, debugging, and monitoring of big data applications Build scalable and fault-tolerant streaming applications Develop scalable recommendation engines Who this book is for If you are an intermediate-level Spark developer looking to master the advanced capabilities and use-cases of Apache Spark 2.x, this Learning Path is ideal for you. Big data professionals who want to learn how to integrate and use the features of Apache Spark and build a strong big data pipeline will also find this Learning Path useful. To grasp the concepts explained in this Learning Path, you must know the fundamentals of Apache Spark and Scala.

Apache Spark for Data Science Cookbook Padma Priya Chitturi, 2016-12-22 Over insightful 90 recipes to get lightning-fast analytics with Apache Spark About This Book Use Apache Spark for data processing with these hands-on recipes Implement end-to-end, large-scale data analysis better than ever before Work with powerful libraries such as MLlib,

SciPy, NumPy, and Pandas to gain insights from your data Who This Book Is For This book is for novice and intermediate level data science professionals and data analysts who want to solve data science problems with a distributed computing framework. Basic experience with data science implementation tasks is expected. Data science professionals looking to skill up and gain an edge in the field will find this book helpful. What You Will Learn Explore the topics of data mining, text mining, Natural Language Processing, information retrieval, and machine learning. Solve real-world analytical problems with large data sets. Address data science challenges with analytical tools on a distributed system like Spark (apt for iterative algorithms), which offers in-memory processing and more flexibility for data analysis at scale. Get hands-on experience with algorithms like Classification, regression, and recommendation on real datasets using Spark MLLib package. Learn about numerical and scientific computing using NumPy and SciPy on Spark. Use Predictive Model Markup Language (PMML) in Spark for statistical data mining models. In Detail Spark has emerged as the most promising big data analytics engine for data science professionals. The true power and value of Apache Spark lies in its ability to execute data science tasks with speed and accuracy. Spark's selling point is that it combines ETL, batch analytics, real-time stream analysis, machine learning, graph processing, and visualizations. It lets you tackle the complexities that come with raw unstructured data sets with ease. This guide will get you comfortable and confident performing data science tasks with Spark. You will learn about implementations including distributed deep learning, numerical computing, and scalable machine learning. You will be shown effective solutions to problematic concepts in data science using Spark's data science libraries such as MLLib, Pandas, NumPy, SciPy, and more. These simple and efficient recipes will show you how to implement algorithms and optimize your work. Style and approach This book contains a comprehensive range of recipes designed to help you learn the fundamentals and tackle the difficulties of data science. This book outlines practical steps to produce powerful insights into Big Data through a recipe-based approach.

PySpark Cookbook Denny Lee, Tomasz Drabas, 2018-06-29 Combine the power of Apache Spark and Python to build effective big data applications Key Features Perform effective data processing, machine learning, and analytics using PySpark Overcome challenges in developing and deploying Spark solutions using Python Explore recipes for efficiently combining Python and Apache Spark to process data Book Description Apache Spark is an open source framework for efficient cluster computing with a strong interface for data parallelism and fault tolerance. The PySpark Cookbook presents effective and time-saving recipes for leveraging the power of Python and putting it to use in the Spark ecosystem. You'll start by learning the Apache Spark architecture and how to set up a Python environment for Spark. You'll then get familiar with the modules available in PySpark and start using them effortlessly. In addition to this, you'll discover how to abstract data with RDDs and DataFrames, and understand the streaming capabilities of PySpark. You'll then move on to using ML and MLLib in order to solve any problems related to the machine learning capabilities of PySpark and use GraphFrames to solve

graph-processing problems. Finally, you will explore how to deploy your applications to the cloud using the spark-submit command. By the end of this book, you will be able to use the Python API for Apache Spark to solve any problems associated with building data-intensive applications. What you will learn

- Configure a local instance of PySpark in a virtual environment
- Install and configure Jupyter in local and multi-node environments
- Create DataFrames from JSON and a dictionary using pyspark.sql
- Explore regression and clustering models available in the ML module
- Use DataFrames to transform data used for modeling
- Connect to PubNub and perform aggregations on streams

Who this book is for The PySpark Cookbook is for you if you are a Python developer looking for hands-on recipes for using the Apache Spark 2.x ecosystem in the best possible way. A thorough understanding of Python (and some familiarity with Spark) will help you get the best out of the book.

Data Algorithms with Spark Mahmoud Parsian, 2022-04-08 Apache Spark's speed, ease of use, sophisticated analytics, and multilanguage support makes practical knowledge of this cluster-computing framework a required skill for data engineers and data scientists. With this hands-on guide, anyone looking for an introduction to Spark will learn practical algorithms and examples using PySpark. In each chapter, author Mahmoud Parsian shows you how to solve a data problem with a set of Spark transformations and algorithms. You'll learn how to tackle problems involving ETL, design patterns, machine learning algorithms, data partitioning, and genomics analysis. Each detailed recipe includes PySpark algorithms using the PySpark driver and shell script. With this book, you will:

- Learn how to select Spark transformations for optimized solutions
- Explore powerful transformations and reductions including reduceByKey(), combineByKey(), and mapPartitions()
- Understand data partitioning for optimized queries
- Build and apply a model using PySpark design patterns
- Apply motif-finding algorithms to graph data
- Analyze graph data by using the GraphFrames API
- Apply PySpark algorithms to clinical and genomics data
- Learn how to use and apply feature engineering in ML algorithms
- Understand and use practical and pragmatic data design patterns

Mastering Spark with R Javier Luraschi, Kevin Kuo, Edgar Ruiz, 2019-10-07 If you're like most R users, you have deep knowledge and love for statistics. But as your organization continues to collect huge amounts of data, adding tools such as Apache Spark makes a lot of sense. With this practical book, data scientists and professionals working with large-scale data applications will learn how to use Spark from R to tackle big data and big compute problems. Authors Javier Luraschi, Kevin Kuo, and Edgar Ruiz show you how to use R with Spark to solve different data analysis problems. This book covers relevant data science topics, cluster computing, and issues that should interest even the most advanced users. Analyze, explore, transform, and visualize data in Apache Spark with R

- Create statistical models to extract information and predict outcomes; automate the process in production-ready workflows
- Perform analysis and modeling across many machines using distributed computing techniques
- Use large-scale data from multiple sources and different formats with ease from within Spark
- Learn about alternative modeling frameworks for graph processing, geospatial analysis, and genomics at scale
- Dive into advanced

topics including custom transformations, real-time data processing, and creating custom Spark extensions

Apache Spark Quick Start Guide Shrey Mehrotra, Akash Grade, 2019-01-31 A practical guide for solving complex data processing challenges by applying the best optimizations techniques in Apache Spark. Key Features Learn about the core concepts and the latest developments in Apache Spark Master writing efficient big data applications with Spark's built-in modules for SQL, Streaming, Machine Learning and Graph analysis Get introduced to a variety of optimizations based on the actual experience Book Description Apache Spark is a flexible framework that allows processing of batch and real-time data. Its unified engine has made it quite popular for big data use cases. This book will help you to get started with Apache Spark 2.0 and write big data applications for a variety of use cases. It will also introduce you to Apache Spark - one of the most popular Big Data processing frameworks. Although this book is intended to help you get started with Apache Spark, but it also focuses on explaining the core concepts. This practical guide provides a quick start to the Spark 2.0 architecture and its components. It teaches you how to set up Spark on your local machine. As we move ahead, you will be introduced to resilient distributed datasets (RDDs) and DataFrame APIs, and their corresponding transformations and actions. Then, we move on to the life cycle of a Spark application and learn about the techniques used to debug slow-running applications. You will also go through Spark's built-in modules for SQL, streaming, machine learning, and graph analysis. Finally, the book will lay out the best practices and optimization techniques that are key for writing efficient Spark applications. By the end of this book, you will have a sound fundamental understanding of the Apache Spark framework and you will be able to write and optimize Spark applications. What you will learn Learn core concepts such as RDDs, DataFrames, transformations, and more Set up a Spark development environment Choose the right APIs for your applications Understand Spark's architecture and the execution flow of a Spark application Explore built-in modules for SQL, streaming, ML, and graph analysis Optimize your Spark job for better performance Who this book is for If you are a big data enthusiast and love processing huge amount of data, this book is for you. If you are data engineer and looking for the best optimization techniques for your Spark applications, then you will find this book helpful. This book also helps data scientists who want to implement their machine learning algorithms in Spark. You need to have a basic understanding of any one of the programming languages such as Scala, Python or Java.

Spark: The Definitive Guide Bill Chambers, Matei Zaharia, 2018-02-08 Learn how to use, deploy, and maintain Apache Spark with this comprehensive guide, written by the creators of the open-source cluster-computing framework. With an emphasis on improvements and new features in Spark 2.0, authors Bill Chambers and Matei Zaharia break down Spark topics into distinct sections, each with unique goals. You'll explore the basic operations and common functions of Spark's structured APIs, as well as Structured Streaming, a new high-level API for building end-to-end streaming applications. Developers and system administrators will learn the fundamentals of monitoring, tuning, and debugging Spark,

and explore machine learning techniques and scenarios for employing MLlib, Spark's scalable machine-learning library. Get a gentle overview of big data and Spark Learn about DataFrames, SQL, and Datasets's core APIs through worked examples Dive into Spark's low-level APIs, RDDs, and execution of SQL and DataFrames Understand how Spark runs on a cluster Debug, monitor, and tune Spark clusters and applications Learn the power of Structured Streaming, Spark's stream-processing engine Learn how you can apply MLlib to a variety of problems, including classification or recommendation

Machine Learning with Spark and Python Michael Bowles, 2019-11-05 Machine Learning with Spark and Python Essential Techniques for Predictive Analytics, Second Edition simplifies ML for practical uses by focusing on two key algorithms. This new second edition improves with the addition of Spark—a ML framework from the Apache foundation. By implementing Spark, machine learning students can easily process much large data sets and call the spark algorithms using ordinary Python code. Machine Learning with Spark and Python focuses on two algorithm families (linear methods and ensemble methods) that effectively predict outcomes. This type of problem covers many use cases such as what ad to place on a web page, predicting prices in securities markets, or detecting credit card fraud. The focus on two families gives enough room for full descriptions of the mechanisms at work in the algorithms. Then the code examples serve to illustrate the workings of the machinery with specific hackable code.

Essential PySpark for Scalable Data Analytics Sreeram Nudurupati, 2021-10-29 Get started with distributed computing using PySpark, a single unified framework to solve end-to-end data analytics at scale Key Features Discover how to convert huge amounts of raw data into meaningful and actionable insights Use Spark's unified analytics engine for end-to-end analytics, from data preparation to predictive analytics Perform data ingestion, cleansing, and integration for ML, data analytics, and data visualization Book Description Apache Spark is a unified data analytics engine designed to process huge volumes of data quickly and efficiently. PySpark is Apache Spark's Python language API, which offers Python developers an easy-to-use scalable data analytics framework. Essential PySpark for Scalable Data Analytics starts by exploring the distributed computing paradigm and provides a high-level overview of Apache Spark. You'll begin your analytics journey with the data engineering process, learning how to perform data ingestion, cleansing, and integration at scale. This book helps you build real-time analytics pipelines that help you gain insights faster. You'll then discover methods for building cloud-based data lakes, and explore Delta Lake, which brings reliability to data lakes. The book also covers Data Lakehouse, an emerging paradigm, which combines the structure and performance of a data warehouse with the scalability of cloud-based data lakes. Later, you'll perform scalable data science and machine learning tasks using PySpark, such as data preparation, feature engineering, and model training and productionization. Finally, you'll learn ways to scale out standard Python ML libraries along with a new pandas API on top of PySpark called Koalas. By the end of this PySpark book, you'll be able to

harness the power of PySpark to solve business problems. What you will learn Understand the role of distributed computing in the world of big data Gain an appreciation for Apache Spark as the de facto go-to for big data processing Scale out your data analytics process using Apache Spark Build data pipelines using data lakes, and perform data visualization with PySpark and Spark SQL Leverage the cloud to build truly scalable and real-time data analytics applications Explore the applications of data science and scalable machine learning with PySpark Integrate your clean and curated data with BI and SQL analysis tools Who this book is for This book is for practicing data engineers, data scientists, data analysts, and data enthusiasts who are already using data analytics to explore distributed and scalable data analytics. Basic to intermediate knowledge of the disciplines of data engineering, data science, and SQL analytics is expected. General proficiency in using any programming language, especially Python, and working knowledge of performing data analytics using frameworks such as pandas and SQL will help you to get the most out of this book.

Deep Learning and Parallel Computing Environment for Bioengineering Systems Arun Kumar

Sangaiah, 2019-07-26 Deep Learning and Parallel Computing Environment for Bioengineering Systems delivers a significant forum for the technical advancement of deep learning in parallel computing environment across bio-engineering diversified domains and its applications. Pursuing an interdisciplinary approach, it focuses on methods used to identify and acquire valid, potentially useful knowledge sources. Managing the gathered knowledge and applying it to multiple domains including health care, social networks, mining, recommendation systems, image processing, pattern recognition and predictions using deep learning paradigms is the major strength of this book. This book integrates the core ideas of deep learning and its applications in bio engineering application domains, to be accessible to all scholars and academicians. The proposed techniques and concepts in this book can be extended in future to accommodate changing business organizations' needs as well as practitioners' innovative ideas. - Presents novel, in-depth research contributions from a methodological/application perspective in understanding the fusion of deep machine learning paradigms and their capabilities in solving a diverse range of problems - Illustrates the state-of-the-art and recent developments in the new theories and applications of deep learning approaches applied to parallel computing environment in bioengineering systems - Provides concepts and technologies that are successfully used in the implementation of today's intelligent data-centric critical systems and multi-media Cloud-Big data

Natural Language Processing with Spark NLP Alex Thomas, 2020-06-25 If you want to build an enterprise-quality application that uses natural language text but aren't sure where to begin or what tools to use, this practical guide will help get you started. Alex Thomas, principal data scientist at Wisecube, shows software engineers and data scientists how to build scalable natural language processing (NLP) applications using deep learning and the Apache Spark NLP library. Through concrete examples, practical and theoretical explanations, and hands-on exercises for using NLP on the Spark processing

framework, this book teaches you everything from basic linguistics and writing systems to sentiment analysis and search engines. You'll also explore special concerns for developing text-based applications, such as performance. In four sections, you'll learn NLP basics and building blocks before diving into application and system building: Basics: Understand the fundamentals of natural language processing, NLP on Apache Spark, and deep learning Building blocks: Learn techniques for building NLP applications—including tokenization, sentence segmentation, and named-entity recognition—and discover how and why they work Applications: Explore the design, development, and experimentation process for building your own NLP applications Building NLP systems: Consider options for productionizing and deploying NLP models, including which human languages to support

Distributed Machine Learning and Gradient Optimization Jiawei Jiang, Bin Cui, Ce Zhang, 2022-02-23 This book presents the state of the art in distributed machine learning algorithms that are based on gradient optimization methods. In the big data era, large-scale datasets pose enormous challenges for the existing machine learning systems. As such, implementing machine learning algorithms in a distributed environment has become a key technology, and recent research has shown gradient-based iterative optimization to be an effective solution. Focusing on methods that can speed up large-scale gradient optimization through both algorithm optimizations and careful system implementations, the book introduces three essential techniques in designing a gradient optimization algorithm to train a distributed machine learning model: parallel strategy, data compression and synchronization protocol. Written in a tutorial style, it covers a range of topics, from fundamental knowledge to a number of carefully designed algorithms and systems of distributed machine learning. It will appeal to a broad audience in the field of machine learning, artificial intelligence, big data and database management.

The book delves into Distributed Deep Learning Framework Over Spark. Distributed Deep Learning Framework Over Spark is a crucial topic that must be grasped by everyone, ranging from students and scholars to the general public. The book will furnish comprehensive and in-depth insights into Distributed Deep Learning Framework Over Spark, encompassing both the fundamentals and more intricate discussions.

1. This book is structured into several chapters, namely:
 - Chapter 1: Introduction to Distributed Deep Learning Framework Over Spark
 - Chapter 2: Essential Elements of Distributed Deep Learning Framework Over Spark
 - Chapter 3: Distributed Deep Learning Framework Over Spark in Everyday Life
 - Chapter 4: Distributed Deep Learning Framework Over Spark in Specific Contexts
 - Chapter 5: Conclusion

2. In chapter 1, this book will provide an overview of Distributed Deep Learning Framework Over Spark. The first chapter will explore what Distributed Deep Learning Framework Over Spark is, why Distributed Deep Learning Framework Over Spark is vital, and how to effectively learn about Distributed Deep Learning Framework Over Spark.
3. In chapter 2, this book will delve into the foundational concepts of Distributed Deep Learning Framework Over Spark. This chapter will elucidate the essential principles that need to be understood to grasp Distributed Deep Learning Framework Over Spark in its entirety.
4. In chapter 3, this book will examine the practical applications of Distributed Deep Learning Framework Over Spark in daily life. This chapter will showcase real-world examples of how Distributed Deep Learning Framework Over Spark can be effectively utilized in everyday scenarios.
5. In chapter 4, the author will scrutinize the relevance of Distributed Deep Learning Framework Over Spark in specific contexts. The fourth chapter will explore how Distributed Deep Learning Framework Over Spark is applied in specialized fields, such as education, business, and technology.
6. In chapter 5, the author will draw a conclusion about Distributed Deep Learning Framework Over Spark. This chapter will summarize the key points that have been discussed throughout the book.

This book is crafted in an easy-to-understand language and is complemented by engaging illustrations. It is highly recommended for anyone seeking to gain a comprehensive understanding of Distributed Deep Learning Framework Over Spark.

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