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Learning Spark Lightning Fast Big Data Analysis

Christian G. Meyer



Learning Spark Lightning Fast Big Data Analysis:

Learning Spark Holden Karau, Andy Konwinski, Patrick Wendell, Matei Zaharia, 2015-01-28 This book introduces Apache Spark the open source cluster computing system that makes data analytics fast to write and fast to run You ll learn how to express parallel jobs with just a few lines of code and cover applications from simple batch jobs to stream processing and machine learning

Learning Spark Jules S. Damji, Brooke Wenig, Tathagata Das, Denny Lee, 2020-07-16 Data is bigger arrives faster and comes in a variety of formats and it all needs to be processed at scale for analytics or machine learning But how can you process such varied workloads efficiently Enter Apache Spark Updated to include Spark 3.0 this second edition shows data engineers and data scientists why structure and unification in Spark matters Specifically this book explains how to perform simple and complex data analytics and employ machine learning algorithms Through step by step walk throughs code snippets and notebooks you ll be able to Learn Python SQL Scala or Java high level Structured APIs Understand Spark operations and SQL Engine Inspect tune and debug Spark operations with Spark configurations and Spark UI Connect to data sources JSON Parquet CSV Avro ORC Hive S3 or Kafka Perform analytics on batch and streaming data using Structured Streaming Build reliable data pipelines with open source Delta Lake and Spark Develop machine learning pipelines with MLlib and productionize models using MLflow

Learning Spark Holden Karau, 2015

Big Data Analytics in Cognitive Social Media and Literary Texts Sanjiv Sharma, Valiur Rahaman, G. R. Sinha, 2021-10-10 This book provides a comprehensive overview of the theory and praxis of Big Data Analytics and how these are used to extract cognition related information from social media and literary texts It presents analytics that transcends the borders of discipline specific academic research and focuses on knowledge extraction prediction and decision making in the context of individual social and national development The content is divided into three main sections the first of which discusses various approaches associated with Big Data Analytics while the second addresses the security and privacy of big data in social media and the last focuses on the literary text as the literary data in Big Data Analytics Sharing valuable insights into the etiology behind human cognition and its reflection in social media and literary texts the book benefits all those interested in analytics that can be applied to literature history philosophy linguistics literary theory media communication studies and computational digital humanities

Social Big Data Analytics Bilal Abu-Salih, Pornpit Wongthongtham, Dengya Zhu, Kit Yan Chan, Amit Rudra, 2021-03-10 This book focuses on data and how modern business firms use social data specifically Online Social Networks OSNs incorporated as part of the infrastructure for a number of emerging applications such as personalized recommendation systems opinion analysis expertise retrieval and computational advertising This book identifies how in such applications social data offers a plethora of benefits to enhance the decision making process This book highlights that business intelligence applications are more focused on structured data however in order to understand and analyse the social big data there is a need to aggregate data from various sources and to present it in a plausible format Big Social Data BSD exhibit all the typical properties of big

data wide physical distribution diversity of formats non standard data models independently managed and heterogeneous semantics but even further valuable with marketing opportunities The book provides a review of the current state of the art approaches for big social data analytics as well as to present dissimilar methods to infer value from social data The book further examines several areas of research that benefits from the propagation of the social data In particular the book presents various technical approaches that produce data analytics capable of handling big data features and effective in filtering out unsolicited data and inferring a value These approaches comprise advanced technical solutions able to capture huge amounts of generated data scrutinise the collected data to eliminate unwanted data measure the quality of the inferred data and transform the amended data for further data analysis Furthermore the book presents solutions to derive knowledge and sentiments from BSD and to provide social data classification and prediction The approaches in this book also incorporate several technologies such as semantic discovery sentiment analysis affective computing and machine learning This book has additional special feature enriched with numerous illustrations such as tables graphs and charts incorporating advanced visualisation tools in accessible an attractive display

Big Data Systems Jawwad Ahmed Shamsi, Muhammad Ali Khojaye, 2021-05-10 Big Data Systems encompass massive challenges related to data diversity storage mechanisms and requirements of massive computational power Further capabilities of big data systems also vary with respect to type of problems For instance distributed memory systems are not recommended for iterative algorithms Similarly variations in big data systems also exist related to consistency and fault tolerance The purpose of this book is to provide a detailed explanation of big data systems The book covers various topics including Networking Security Privacy Storage Computation Cloud Computing NoSQL and NewSQL systems High Performance Computing and Deep Learning An illustrative and practical approach has been adopted in which theoretical topics have been aided by well explained programming and illustrative examples Key Features Introduces concepts and evolution of Big Data technology Illustrates examples for thorough understanding Contains programming examples for hands on development Explains a variety of topics including NoSQL Systems NewSQL systems Security Privacy Networking Cloud High Performance Computing and Deep Learning Exemplifies widely used big data technologies such as Hadoop and Spark Includes discussion on case studies and open issues Provides end of chapter questions for enhanced learning

Essentials of Business Analytics Bhimasankaram Pochiraju, Sridhar Seshadri, 2019-07-10 This comprehensive edited volume is the first of its kind designed to serve as a textbook for long duration business analytics programs It can also be used as a guide to the field by practitioners The book has contributions from experts in top universities and industry The editors have taken extreme care to ensure continuity across the chapters The material is organized into three parts A Tools B Models and C Applications In Part A the tools used by business analysts are described in detail In Part B these tools are applied to construct models used to solve business problems Part C contains detailed applications in various functional areas of business and several case studies Supporting

material can be found in the appendices that develop the pre requisites for the main text Every chapter has a business orientation Typically each chapter begins with the description of business problems that are transformed into data questions and methodology is developed to solve these questions Data analysis is conducted using widely used software the output and results are clearly explained at each stage of development These are finally transformed into a business solution The companion website provides examples data sets and sample code for each chapter

Proceedings of the International Conference on Advanced Intelligent Systems and Informatics 2020 Aboul Ella Hassanien,Adam Slowik,Václav Snášel,Hisham El-Deeb,Fahmy M. Tolba,2020-09-19 This book presents the proceedings of the 6th International Conference on Advanced Intelligent Systems and Informatics 2020 AISI2020 which took place in Cairo Egypt from October 19 to 21 2020 This international and interdisciplinary conference which highlighted essential research and developments in the fields of informatics and intelligent systems was organized by the Scientific Research Group in Egypt SRGE The book is divided into several sections covering the following topics Intelligent Systems Deep Learning Technology Document and Sentiment Analysis Blockchain and Cyber Physical System Health Informatics and AI against COVID 19 Data Mining Power and Control Systems Business Intelligence Social Media and Digital Transformation Robotic Control Design and Smart Systems

Multimedia Information Retrieval Eduardo Quevedo,2021-06-02 Due to increasing globalization and the explosion of media available on the Internet computer techniques to organize classify and find desired media are becoming more and more relevant One such technique to extract semantic information from multimedia data sources is Multimedia Information Retrieval MMIR or MIR MIR is a broad area covering both structural issues and intelligent content analysis and retrieval These aspects must be integrated into a seamless whole which involves expertise from a wide variety of fields This book presents recent applications of MIR for content based image retrieval bioinformation analysis and processing forensic multimedia retrieval techniques and audio and music classification

Proceedings of the Fourth International Conference on Microelectronics, Computing and Communication Systems Vijay Nath,J. K. Mandal,2020-09-19 This book presents high quality papers from the Fourth International Conference on Microelectronics Computing Communication Systems MCCS 2019 It discusses the latest technological trends and advances in MEMS and nanoelectronics wireless communication optical communication instrumentation signal processing image processing bioengineering green energy hybrid vehicles environmental science weather forecasting cloud computing renewable energy RFID CMOS sensors actuators transducers telemetry systems embedded systems and sensor network applications It includes papers based on original theoretical practical and experimental simulations development applications measurements and testing The applications and solutions discussed here provide excellent reference material for future product development

Big Data Analytics with Spark Mohammed Guller,2015-12-29 Big Data Analytics with Spark is a step by step guide for learning Spark which is an open source fast and general purpose cluster computing framework for large scale data analysis You will learn how to use

Spark for different types of big data analytics projects including batch interactive graph and stream data analysis as well as machine learning In addition this book will help you become a much sought after Spark expert Spark is one of the hottest Big Data technologies The amount of data generated today by devices applications and users is exploding Therefore there is a critical need for tools that can analyze large scale data and unlock value from it Spark is a powerful technology that meets that need You can for example use Spark to perform low latency computations through the use of efficient caching and iterative algorithms leverage the features of its shell for easy and interactive Data analysis employ its fast batch processing and low latency features to process your real time data streams and so on As a result adoption of Spark is rapidly growing and is replacing Hadoop MapReduce as the technology of choice for big data analytics This book provides an introduction to Spark and related big data technologies It covers Spark core and its add on libraries including Spark SQL Spark Streaming GraphX and MLlib Big Data Analytics with Spark is therefore written for busy professionals who prefer learning a new technology from a consolidated source instead of spending countless hours on the Internet trying to pick bits and pieces from different sources The book also provides a chapter on Scala the hottest functional programming language and the program that underlies Spark You ll learn the basics of functional programming in Scala so that you can write Spark applications in it What s more Big Data Analytics with Spark provides an introduction to other big data technologies that are commonly used along with Spark like Hive Avro Kafka and so on So the book is self sufficient all the technologies that you need to know to use Spark are covered The only thing that you are expected to know is programming in any language There is a critical shortage of people with big data expertise so companies are willing to pay top dollar for people with skills in areas like Spark and Scala So reading this book and absorbing its principles will provide a boost possibly a big boost to your career

Scala and Spark for Big Data Analytics Md. Rezaul Karim, Sridhar Alla, 2017-07-25 Harness the power of Scala to program Spark and analyze tonnes of data in the blink of an eye About This Book Learn Scala s sophisticated type system that combines Functional Programming and object oriented concepts Work on a wide array of applications from simple batch jobs to stream processing and machine learning Explore the most common as well as some complex use cases to perform large scale data analysis with Spark Who This Book Is For Anyone who wishes to learn how to perform data analysis by harnessing the power of Spark will find this book extremely useful No knowledge of Spark or Scala is assumed although prior programming experience especially with other JVM languages will be useful to pick up concepts quicker What You Will Learn Understand object oriented functional programming concepts of Scala In depth understanding of Scala collection APIs Work with RDD and DataFrame to learn Spark s core abstractions Analysing structured and unstructured data using SparkSQL and GraphX Scalable and fault tolerant streaming application development using Spark structured streaming Learn machine learning best practices for classification regression dimensionality reduction and recommendation system to build predictive models with widely used algorithms in Spark MLlib ML Build clustering models to cluster a vast amount of data Understand tuning

debugging and monitoring Spark applications Deploy Spark applications on real clusters in Standalone Mesos and YARN In Detail Scala has been observing wide adoption over the past few years especially in the field of data science and analytics Spark built on Scala has gained a lot of recognition and is being used widely in productions Thus if you want to leverage the power of Scala and Spark to make sense of big data this book is for you The first part introduces you to Scala helping you understand the object oriented and functional programming concepts needed for Spark application development It then moves on to Spark to cover the basic abstractions using RDD and DataFrame This will help you develop scalable and fault tolerant streaming applications by analyzing structured and unstructured data using SparkSQL GraphX and Spark structured streaming Finally the book moves on to some advanced topics such as monitoring configuration debugging testing and deployment You will also learn how to develop Spark applications using SparkR and PySpark APIs interactive data analytics using Zeppelin and in memory data processing with Alluxio By the end of this book you will have a thorough understanding of Spark and you will be able to perform full stack data analytics with a feel that no amount of data is too big Style and approach Filled with practical examples and use cases this book will not only help you get up and running with Spark but will also take you farther down the road to becoming a data scientist

Data Analysis with Python and PySpark Jonathan Rioux, 2022-04-12 Think big about your data PySpark brings the powerful Spark big data processing engine to the Python ecosystem letting you seamlessly scale up your data tasks and create lightning fast pipelines In *Data Analysis with Python and PySpark* you will learn how to Manage your data as it scales across multiple machines Scale up your data programs with full confidence Read and write data to and from a variety of sources and formats Deal with messy data with PySpark's data manipulation functionality Discover new data sets and perform exploratory data analysis Build automated data pipelines that transform summarize and get insights from data Troubleshoot common PySpark errors Creating reliable long running jobs *Data Analysis with Python and PySpark* is your guide to delivering successful Python driven data projects Packed with relevant examples and essential techniques this practical book teaches you to build pipelines for reporting machine learning and other data centric tasks Quick exercises in every chapter help you practice what you've learned and rapidly start implementing PySpark into your data systems No previous knowledge of Spark is required About the technology The Spark data processing engine is an amazing analytics factory raw data comes in insight comes out PySpark wraps Spark's core engine with a Python based API It helps simplify Spark's steep learning curve and makes this powerful tool available to anyone working in the Python data ecosystem About the book *Data Analysis with Python and PySpark* helps you solve the daily challenges of data science with PySpark You'll learn how to scale your processing capabilities across multiple machines while ingesting data from any source whether that's Hadoop clusters cloud data storage or local data files Once you've covered the fundamentals you'll explore the full versatility of PySpark by building machine learning pipelines and blending Python pandas and PySpark code What's inside Organizing your PySpark code Managing your data no matter the size Scale

up your data programs with full confidence Troubleshooting common data pipeline problems Creating reliable long running jobs About the reader Written for data scientists and data engineers comfortable with Python About the author As a ML director for a data driven software company Jonathan Rioux uses PySpark daily He teaches the software to data scientists engineers and data savvy business analysts Table of Contents 1 Introduction PART 1 GET ACQUAINTED FIRST STEPS IN PYSPARK 2 Your first data program in PySpark 3 Submitting and scaling your first PySpark program 4 Analyzing tabular data with pyspark sql 5 Data frame gymnastics Joining and grouping PART 2 GET PROFICIENT TRANSLATE YOUR IDEAS INTO CODE 6 Multidimensional data frames Using PySpark with JSON data 7 Bilingual PySpark Blending Python and SQL code 8 Extending PySpark with Python RDD and UDFs 9 Big data is just a lot of small data Using pandas UDFs 10 Your data under a different lens Window functions 11 Faster PySpark Understanding Spark s query planning PART 3 GET CONFIDENT USING MACHINE LEARNING WITH PYSPARK 12 Setting the stage Preparing features for machine learning 13 Robust machine learning with ML Pipelines 14 Building custom ML transformers and estimators

Practical Big Data Analytics Nataraj Dasgupta,2018-01-15 Get command of your organizational Big Data using the power of data science and analytics Key Features A perfect companion to boost your Big Data storing processing analyzing skills to help you take informed business decisions Work with the best tools such as Apache Hadoop R Python and Spark for NoSQL platforms to perform massive online analyses Get expert tips on statistical inference machine learning mathematical modeling and data visualization for Big Data Book Description Big Data analytics relates to the strategies used by organizations to collect organize and analyze large amounts of data to uncover valuable business insights that otherwise cannot be analyzed through traditional systems Crafting an enterprise scale cost efficient Big Data and machine learning solution to uncover insights and value from your organization s data is a challenge Today with hundreds of new Big Data systems machine learning packages and BI Tools selecting the right combination of technologies is an even greater challenge This book will help you do that With the help of this guide you will be able to bridge the gap between the theoretical world of technology with the practical ground reality of building corporate Big Data and data science platforms You will get hands on exposure to Hadoop and Spark build machine learning dashboards using R and R Shiny create web based apps using NoSQL databases such as MongoDB and even learn how to write R code for neural networks By the end of the book you will have a very clear and concrete understanding of what Big Data analytics means how it drives revenues for organizations and how you can develop your own Big Data analytics solution using different tools and methods articulated in this book What you will learn Get a 360 degree view into the world of Big Data data science and machine learning Broad range of technical and business Big Data analytics topics that caters to the interests of the technical experts as well as corporate IT executives Get hands on experience with industry standard Big Data and machine learning tools such as Hadoop Spark MongoDB KDB and R Create production grade machine learning BI Dashboards using R and R Shiny with step by step instructions Learn how to combine open source Big Data

machine learning and BI Tools to create low cost business analytics applications Understand corporate strategies for successful Big Data and data science projects Go beyond general purpose analytics to develop cutting edge Big Data applications using emerging technologies Who this book is for The book is intended for existing and aspiring Big Data professionals who wish to become the go to person in their organization when it comes to Big Data architecture analytics and governance While no prior knowledge of Big Data or related technologies is assumed it will be helpful to have some programming experience

Big Data Processing with Apache Spark Renata Sloane, 2025-06-23 Power Through Big Data at Lightning Speed With Apache Spark In a world overflowing with data Apache Spark stands out as the go to engine for fast distributed processing of massive datasets This hands on guide introduces you to the core concepts and real world use cases of big data analytics using Apache Spark helping you handle data at scale with ease and efficiency Whether you re working with batch jobs real time streaming or machine learning pipelines this book walks you through the practical steps to build scalable applications for modern data problems using Spark s APIs in Python PySpark Scala and Java

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 PySparkIntegrate your clean and curated data with BI and SQL analysis toolsWho 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 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

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 Spark 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

Data Analytics with Spark Using Python Jeffrey Aven,2018-06-18 Solve Data Analytics Problems with Spark PySpark and Related Open Source Tools Spark is at the heart of today s Big Data revolution helping data professionals supercharge efficiency and performance in a wide range of data processing and analytics tasks In this guide Big Data expert Jeffrey Aven covers all you need to know to leverage Spark together with its extensions subprojects and wider ecosystem Aven combines a language agnostic introduction to foundational Spark concepts with extensive programming examples utilizing the popular and intuitive PySpark development environment This guide s focus on Python makes it widely accessible to large audiences of data professionals analysts and developers even those with little Hadoop or Spark experience Aven s broad coverage ranges from basic to advanced Spark programming and Spark SQL to machine learning You ll learn how to efficiently manage all forms of data with Spark streaming structured semi structured and unstructured Throughout concise topic overviews quickly get you up to speed and extensive hands on exercises prepare you to solve real problems Coverage includes Understand Spark s evolving role in the Big Data and Hadoop ecosystems Create Spark clusters using various deployment modes Control and optimize the operation of Spark clusters and applications Master Spark Core RDD API programming techniques Extend accelerate and optimize Spark routines with advanced API platform constructs including shared variables RDD storage and partitioning Efficiently integrate Spark with both SQL and nonrelational data stores Perform stream processing and messaging with Spark Streaming and Apache Kafka Implement predictive modeling with SparkR and Spark MLlib

Advanced Analytics with Spark Sandy Ryza,Uri Laserson,Sean Owen,Josh Wills,2017-06-12 In the second edition of this practical book four Cloudera data scientists present a set of self contained patterns for performing large scale data analysis with Spark The authors bring Spark statistical methods and real world data sets together to teach you how to approach analytics problems by example Updated for Spark 2.1 this edition acts as an introduction to these techniques and other best practices in Spark programming You ll start with an introduction to Spark and its ecosystem and then dive into patterns that apply common techniques including classification clustering collaborative filtering and anomaly detection to fields such as genomics security and finance If you have an entry level understanding of machine learning and statistics and you program

in Java Python or Scala you ll find the book s patterns useful for working on your own data applications With this book you will Familiarize yourself with the Spark programming model Become comfortable within the Spark ecosystem Learn general approaches in data science Examine complete implementations that analyze large public data sets Discover which machine learning tools make sense for particular problems Acquire code that can be adapted to many uses

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