High Integrity Software The Spark Approach To Safety And Security

High Integrity SoftwareBuilding High Integrity Applications with SPARKHigh Integrity AdaSparkSoftware Engineering and Formal MethodsReal-Time Big Data AnalyticsReliable Software Technologies -- Ada-Europe 2013Advances in Model and Data Engineering in the Digitalization EraTests and ProofsEngineering Secure Software and SystemsSpark 2014 User's GuideReliable Software Technologies, Ada-Europe ...Industrial Use of Formal MethodsAstronomical Data Analysis Software and Systems IIThe Development of the Engine Control Module Software for Cornell's 2003 Formula SAE Reace CarThe Complete Directory of Automated Design SoftwareProceedingsPC/ComputingIn-vehicle Software & Hardware SystemsBuilding High Integrity Applications With Spark John Gilbert Presslie Barnes John W. McCormick John Gilbert Presslie Barnes John G. P. Barnes Alessandro Cimatti Sumit Gupta Hubert B. Keller Philippe Fournier-Viger Martina Seidl Úlfar Erlingsson Adacore Team Jean-Louis Boulanger R. J. Hanisch Adnan Albakri Neal Weinstock Julia Nieves

this book provides an accessible introduction to the spark programming language updated classic that covers all of the new features of spark

including object oriented programming the only book on the market that covers this important and robust programming language cd rom contains the main spark tools and additional manuals giving all the information needed to use spark in practice technology the spark language is aimed at writing reliable software that combines simplicity and rigour within a practical framework because of this many safety critical high integrity systems are developed using spark user level intermediate audience software engineers programmers technical leaders software managers engineering companies in fields such as avionics railroads medical instrumentation and automobiles academics giving msc courses in safety critical systems engineering system safety engineering software engineering author biography john barnes is a veteran of the computing industry in 1977 he designed and implemented the rtl 2 programming language and was an original member of the ada programming language design team he was founder and md of alsys ltd from 1985 to 1991 currently self employed john is the author of programming in ada which has sold 150000 copies and been translated into 6 languages

software is pervasive in our lives we are accustomed to dealing with the failures of much of that software restarting an application is a very familiar solution such solutions are unacceptable when the software controls our cars airplanes and medical devices or manages our private information these applications must run without error spark provides a means based on mathematical proof to guarantee that a program has no errors spark is a formally defined programming language and a set of verification tools specifically designed to support the development of software used in high integrity applications using spark developers can formally verify properties of their code such as information flow freedom from runtime errors functional correctness security properties and safety properties written by two spark experts this is the first introduction to the just released 2014 version it will help students and developers alike master the basic concepts for building systems with spark

this pack introduces the spark language and its associated tools and teaches the principles of writing safety critical software using spark a subset of the ada 95 language spark was specifically developed to serve industries developing high integrity safety critical software with a language and associated toolset which increase the likelihood of the program behaving as intended

this book constitutes the refereed proceedings of the 15th international conference on software engineering and formal methods sefm 2017 held in trento italy in september 2017 the 17 full papers and 6 short papers presented were carefully reviewed and selected from 102

submissions the papers deal with a large range of topics in the following research areas new frontiers in software architecture software verification and testing software development methods application and technology transfer security and safety and design principles

design process and analyze large sets of complex data in real time about this book get acquainted with transformations and database level interactions and ensure the reliability of messages processed using storm implement strategies to solve the challenges of real time data processing load datasets build queries and make recommendations using spark sql who this book is for if you are a big data architect developer or a programmer who wants to develop applications frameworks to implement real time analytics using open source technologies then this book is for you what you will learn explore big data technologies and frameworks work through practical challenges and use cases of real time analytics versus batch analytics develop real word use cases for processing and analyzing data in real time using the programming paradigm of apache storm handle and process real time transactional data optimize and tune apache storm for varied workloads and production deployments process and stream data with amazon kinesis and elastic mapreduce perform interactive and exploratory data analytics using spark sql develop common enterprise architectures applications for real time and batch analytics in detail enterprise has been striving hard to deal with the challenges of data arriving in real time or near real time although there are technologies such as storm and spark and many more that solve the challenges of real time data using the appropriate technology framework for the right business use case is the key to success this book provides you with the skills required to quickly design implement and deploy your real time analytics using real world examples of big data use cases from the beginning of the book we will cover the basics of varied real time data processing frameworks and technologies we will discuss and explain the differences between batch and real time processing in detail and will also explore the techniques and programming concepts using apache storm moving on we ll familiarize you with amazon kinesis for real time data processing on cloud we will further develop your understanding of real time analytics through a comprehensive review of apache spark along with the high level architecture and the building blocks of a spark program you will learn how to transform your data get an output from transformations and persist your results using spark rdds using an interface called spark sql to work with spark at the end of this book we will introduce spark streaming the streaming library of spark and will walk you through the emerging lambda architecture la which provides a hybrid platform for big data processing by combining real time and precomputed batch data to provide a near real time view of incoming data style and approach this step by step is an easy to follow detailed tutorial filled with practical examples of basic and advanced features each topic is explained sequentially and supported by real world examples and executable code

snippets

this book constitutes the refereed proceedings of the 18th ada europe international conference on reliable software technologies ada europe 2013 was held in berlin germany in june 2013 the 11 full papers presented were carefully reviewed and selected from various submissions they are organized in topical sections on multi core and distributed systems ada and spark dependability and real time systems

this volume constitutes short papers and detect 2022 workshop papers presented during the 11th international conference on model and data engineering medi 2022 held in cairo egypt in november 2022 the 11 short papers presented were selected from the total of 65 submissions this volume also contains the 4 accepted papers from the detect 2022 workshop held at medi 2022 the volume focuses on advances in data management and modelling including topics such as data models data processing database theory database systems technology and advanced database applications

this book constitutes the refereed proceedings of the 8th international conference on tests and proofs tap 2014 held in york uk in july 2014 as part of the staf 2014 federated conferences the 10 revised full papers and 4 short papers presented together with two tutorial descriptions were carefully reviewed and selected from 27 submissions the papers cover topics in the following four research areas test generation bridging semantic gaps integrated development processes and bounded verification

this book constitutes the refereed proceedings of the third international symposium on engineering secure software and systems essos 2011 held in madrid italy in february 2011 the 18 revised full papers presented together with 3 idea papers were carefully reviewed and selected from 63 submissions the papers are organized in topical sections on model based security tools and mechanisms security security requirements engineering and authorization

spark 2014 is a programming language and a set of verification tools designed to meet the needs of high assurance software development spark 2014 is based on ada 2012 both subsetting the language to remove features that defy verification but also extending the system of contracts and aspects to support modular formal verification the new aspects support abstraction and refinement and facilitate deep static analysis to be performed including flow analysis and formal verification of an implementation against a specification spark 2014 is a much

larger and more flexible language than its predecessor spark 2005 the language can be configured to suit a number of application domains and standards from server class high assurance systems such as air traffic management applications to embedded hard real time critical systems such as avionic systems complying with do 178c level a a major feature of spark 2014 is the support for a mixture of proof and other verification methods such as testing which facilitates in particular the use of unit proof in place of unit testing an approach now formalized in do 178c and the do 333 formal methods supplement certain units may be formally proven and other units validated through testing

at present the literature gives students and researchers of the very general books on the formal technics the purpose of this book is to present in a single book a return of experience on the used of the formal technics such proof and model checking on industrial examples for the transportation domain this book is based on the experience of people which are completely involved in the realization and the evaluation of safety critical system software based the implication of the industrialists allows to raise the problems of confidentiality which could appear and so allow to supply new useful information photos plan of architecture real example

the ase conference is the major conference for theory and practice concerned with automating the software development process formerly known as knowledge based software engineering kbse the conference expanded in order to reach out to other scientific communities concerned with the automation aspects of formal methods software process human computer interaction requirements engineering reverse engineering testing and verification and validation while still including an active artificial intelligence and knowledge based research focus

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