Real-Time Large-Scale Data Analytics and Information Retrieval in Practice

Aleksandar Bradic, Igor Bogicevic

December 25, 2009

Contents

Chapter 1

Introduction

1.1 Enter Real Time

1.2 Problems, Pitfalls and Challenges

Chapter 2

The nature of large-scale data

2.1 Data Archives

2.2 Data Streams

Chapter 3

The challenges of real-time information processing

3.1 Problem description

Chapter 4

Fundamental Algorithms in Data Analytics and IR

4.1 Statistical analysis framework

4.1.1 Regression analysis

4.1.2 Forecasting

4.1.3 Parameter estimation

4.1.4 Non-parametric methods

Chapter 5

Advanced Algorithms

5.1 Online learning algorithms

5.2 Kernel Methods

Chapter 6

Software toolkits for large-scale data analysis

6.1 Hadoop

6.2 Mahout

6.3 voidbase

Chapter 7

Large-scale IR Cookbook

7.1 Building AVMs on vertical data

7.2 Model selection in the real world

Chapter 8

Moving from batch to real-time

8.1 Paradigm shift

Chapter 9

Real-world real-time applications

Chapter 10

Algorithms and Data Structure in support of large-scale real-time framework

10.1 Convolutional procedures

10.1.1 Example : Viterbi algorithm

10.2 Convolutional representation of fundamental algebraic operations

10.2.1 Average,Mean,Median,Variance

10.2.2 Matrix operations

10.3 Randomized Algorithms

10.3.1 Fast vs. Convolutional

10.4 Queue-based structures

Chapter 11

voidbase : queue-based computing framework

11.1 Overview

11.2 Paradigms

Chapter 12

voidbase cookbook

12.1 Zero-development dynamic resource monitoring framework

12.2 Automatic trend detection toolkit

12.3 Building automated news-based algorithmic trading app

Chapter 13

Future challenges in Real-Time Large-Scale analytical processing

13.1 Representation problem

13.2 Fundamental limits