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

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- 1.2 Problems, Pitfalls and Challenges

# The nature of large-scale data

- 2.1 Data Archives
- 2.2 Data Streams

# The challenges of real-time information processing

#### 3.1 Problem description

## Fundamental Algorithms in Data Analytics and IR

- 4.1 Statistical analysis framework
- 4.1.1 Regression analysis
- 4.1.2 Forecasting
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# **Advanced Algorithms**

- 5.1 Online learning algorithms
- 5.2 Kernel Methods

# Software toolkits for large-scale data analysis

- 6.1 Hadoop
- 6.2 Mahout
- 6.3 voidbase

# Large-scale IR Cookbook

- 7.1 Building AVMs on vertical data
- 7.2 Model selection in the real world

# Moving from batch to real-time

8.1 Paradigm shift

# Real-world real-time applications

- 9.1 Web Analytics
- 9.2 Media analysis
- 9.3 Econometrics
- 9.4 Finance
- 9.5 Online collaboration

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

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- 10.1.1 Example: Viterbi algorithm
- 10.2 Convolutional representation of fundamental algebraic operations
- $10.2.1 \quad Average, Mean, Median, Variance$
- ${\bf 10.2.2} \quad {\bf Matrix \ operations}$
- 10.3 Randomized Algorithms
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- 10.4 Queue-based structures

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- 11.1 Overview
- 11.2 Paradigms

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- 12.1 Zero-development dynamic resource monitoring framework
- 12.2 Automatic trend detection toolkit
- 12.3 Building automated news-based algorithmic trading app

# Future challenges in Real-Time Large-Scale analytical processing

- 13.1 Representation problem
- 13.2 Fundamental limits

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