1. Record Nr. UNINA9910810663903321

Autore	Amaratunga Dhammika <1956->
Titolo	Exploration and analysis of DNA microarray and other high dimensional data / / Dhammika Amaratunga, Javier Cabrera, Ziv Shkedy, authors
Pubbl/distr/stampa	Hoboken, New Jersey : , : John Wiley & Sons, , 2014 ©2014
ISBN	1-118-36450-3 1-118-36453-8
Edizione	[Second edition.]
Descrizione fisica	1 online resource (346 p.)
Collana	Wiley series in probability and statistics
Altri autori (Persone)	CabreraJavier ShkedyZiv
Disciplina	572/.636
Soggetti	Protein microarrays - Statistical methods
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Title Page; Contents; Preface; Chapter 1 A Brief Introduction; 1.1 A Note on Exploratory Data Analysis; 1.2 Computing Considerations and Software; 1.3 A Brief Outline of the Book; 1.4 Data Sets and Case Studies; 1.4.1 The Golub Data; 1.4.2 The Mouse5 Data; 1.4.3 The Khan Data; 1.4.4 The Sialin Data; 1.4.5 The Behavioral Study Data; 1.4.6 The Spiked-In Data; 1.4.7 The APOAI Study; 1.4.8 The Breast Cancer Data; 1.4.9 Platinum Spike Data Set; 1.4.10 Human Epidermal Squamous Carcinoma Cell Line A431 Experiment; 1.4.11 Note: Public Repositories of Microarray Data; Chapter 2 Genomics Basics 2.1 Genes2.2 Deoxyribonucleic Acid; 2.3 Gene Expression; 2.4 Hybridization Assays and Other Laboratory Techniques; 2.5 The Human Genome; 2.6 Genome Variations and Their Consequences; 2.7 Genomics; 2.8 The Role of Genomics in Pharmaceutical Research and Clinical Practice; 2.9 Proteins; 2.10 Bioinformatics; Supplementary Reading; Chapter 3 Microarrays; 3.1 Types of Microarray Experiments; 3.1.1 Experiment Type 1: Tissue-Specific Gene Expression; 3.1.2 Experiment Type 2: Developmental Genetics; 3.1.3 Experiment Type 3: Genetic Diseases; 3.1.4 Experiment Type 4: Complex Diseases 3.1.5 Experiment Type 5: Pharmacological Agents3.1.6 Experiment Type 6: Plant Breeding; 3.1.7 Experiment Type 7: Environmental Monitoring; 3.2 A Very Simple Hypothetical Microarray Experiment; 3.3

A Typical Microarray Experiment; 3.3.1 Microarray Preparation; 3.3.2 Sample Preparation; 3.3.3 The Hybridization Step; 3.3.4 Scanning the Microarray; 3.3.5 Interpreting the Scanned Image; 3.4 Multichannel cDNA Microarrays; 3.5 Oligonucleotide Microarrays; 3.6 Bead-Based Arrays; 3.7 Confirmation of Microarray Results; Supplementary Reading and Electronic References
Chapter 4 Processing the Scanned Image4.1 Converting the Scanned Image to the Spotted Image; 4.1.1 Gridding; 4.1.2 Segmentation; 4.1.3 Quantification; 4.2 Quality Assessment; 4.2.1 Visualizing the Spotted Image; 4.2.2 Numerical Evaluation of Array Quality; 4.2.3 Spatial Problems; 4.2.4 Spatial Randomness; 4.2.5 Quality Control of Arrays; 4.2.6 Assessment of Spot Quality; 4.3 Adjusting for Background; 4.3.1 Estimating the Background; 4.3.2 Adjusting for the Estimated Background; 4.4 Expression-Level Calculation for Two-Channel cDNA Microarrays
4.5 Expression-Level Calculation for Oligonucleotide Microarrays4.5.1 The Average Difference; 4.5.2 A Weighted Average Difference; 4.5.3 Perfect Matches Only; 4.5.4 Background Adjustment Approach; 4.5.5 Model-Based Approach; 4.5.6 Absent-Present Calls; Supplementary Reading; Software Notes; Chapter 5 Preprocessing Microarray Data; 5.1 Logarithmic Transformation; 5.2 Variance Stabilizing Transformations; 5.3 Sources of Bias; 5.4 Normalization; 5.5 Intensity-Dependent Normalization; 5.5.1 Smooth Function Normalization; 5.5.2 Quantile Normalization; 5.5.3 Stagewise Normalization
5.5.4 Normalization of Two-Channel Arrays

Sommario/riassunto

Praise for the First Edition "...extremely well written...a comprehensive and up-to-date overview of this important field." - Journal of Environmental Quality Exploration and Analysis of DNA Microarray and Other High-Dimensional Data, Second Edition provides comprehensive coverage of recent advancements in microarray data analysis. A cutting-edge guide, the Second Edition demonstrates various methodologies for analyzing data in biomedical research and offers an overview of the modern techniques used in microarray technology to