

Contents

Part I Sequence Analysis

1 Accuracy Assessment of Consensus Sequence from Shotgun Sequencing	3
Lei M. Li	
2 Statistical and Computational Studies on Alternative Splicing	31
Liang Chen	
3 Statistical Learning and Modeling of TF-DNA Binding	55
Bo Jiang and Jun S. Liu	
4 Computational Promoter Prediction in a Vertebrate Genome	73
Michael Q. Zhang	
5 Discovering Influential Variables: A General Computer Intensive Method for Common Genetic Disorders.....	87
Tian Zheng, Herman Chernoff, Inchi Hu, Iuliana Ionita-Laza, and Shaw-Hwa Lo	
6 STORMSeq: A Method for Ranking Regulatory Sequences by Integrating Experimental Datasets with Diverse Computational Predictions.....	109
Jim C. Huang and Brendan J. Frey	
7 Mixture Tree Construction and Its Applications.....	135
Grace S.C. Chen, Mingze Li, Michael Rosenberg, and Bruce Lindsay	

Part II Expression Data Analysis

- 8 **Experimental Designs and ANOVA for Microarray Data**.....151
Richard E. Kennedy and Xiangqin Cui
- 9 **The MicroArray Quality Control (MAQC) Project
and Cross-Platform Analysis of Microarray Data**171
Zhining Wen, Zhenqiang Su, Jie Liu, Baitang Ning, Lei Guo,
Weida Tong, and Leming Shi
- 10 **A Survey of Classification Techniques for Microarray
Data Analysis**.....193
Wai-Ki Yip, Samir B. Amin, and Cheng Li
- 11 **Statistical Analysis of Single Nucleotide Polymorphism
Microarrays in Cancer Studies**225
Pierre Neuvial, Henrik Bengtsson, and Terence P. Speed
- 12 **Computational Analysis of ChIP-chip Data**257
Hongkai Ji
- 13 **eQTL Mapping for Functional Classes of *Saccharomyces
cerevisiae* Genes with Multivariate Sparse Partial Least
Squares Regression**283
Dongjun Chung and Sündüz Keleş
- 14 **Statistical Analysis of Time Course Microarray Data**299
Lingyan Ruan and Ming Yuan

Part III Systems Biology

- 15 **Kernel Methods in Bioinformatics**.....317
Karsten M. Borgwardt
- 16 **Graph Classification Methods in Chemoinformatics**335
Koji Tsuda
- 17 **Hidden Markov Random Field Models for Network-Based
Analysis of Genomic Data**353
Hongzhe Li
- 18 **Review of Weighted Gene Coexpression Network Analysis**369
Tova Fuller, Peter Langfelder, Angela Presson,
and Steve Horvath

19 Liquid Association and Related Ideas in Quantifying Changes in Correlation	389
Ker-Chau Li	
20 Boolean Networks	405
Tung-Hung Chueh and Henry Horng-Shing Lu	
21 Protein Interaction Networks: Protein Domain Interaction and Protein Function Prediction	427
Yanjun Qi and William Stafford Noble	
22 Reverse Engineering of Gene Regulation Networks with an Application to the DREAM4 <i>in silico</i> Network Challenge	461
Hyonho Chun, Jia Kang, Xianghua Zhang, Minghua Deng, Haisu Ma, and Hongyu Zhao	
23 Inferring Signaling and Gene Regulatory Network from Genetic and Genomic Information	479
Zhidong Tu, Jun Zhu, and Fengzhu Sun	
24 Computational Drug Target Pathway Discovery: A Bayesian Network Approach	501
Seiya Imoto, Yoshinori Tamada, Hiromitsu Araki, and Satoru Miyano	
25 Cancer Systems Biology	533
Elana J. Fertig, Ludmila V. Danilova, and Michael F. Ochs	
26 Comparative Genomics	567
Xuhua Xia	
27 Robust Control of Immune Systems Under Noises: Stochastic Game Approach	601
Bor-Sen Chen, Chia-Hung Chang, and Yung-Jen Chuang	