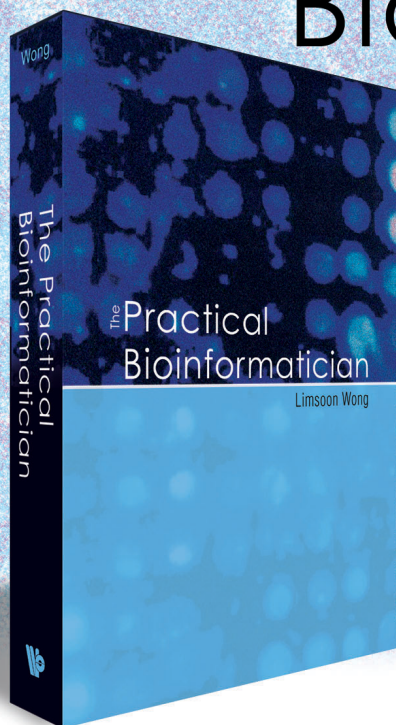


The Practical Bioinformatician



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edited by

Limsoon Wong

(Institute for Infocomm Research, Singapore)

Computer scientists have increasingly been enlisted as “bioinformaticians” to assist molecular biologists in their research. This book is a practical introduction to bioinformatics for these computer scientists. The chapters are in-depth discussions by expert bioinformaticians on both general techniques and specific approaches to a range of selected bioinformatics problems. The book is organized into clusters of chapters on the following topics:

- Overview of modern molecular biology and a broad spectrum of techniques from computer science — data mining, machine learning, mathematical modeling, sequence alignment, data integration, workflow development, etc.
- In-depth discussion of computational recognition of functional and regulatory sites in DNA sequences.
- Incisive discussion of computational prediction of secondary structure of RNA sequences.
- Overview of computational prediction of protein cellular localization, and selected discussions of inference of protein function.
- Overview of methods for discovering protein–protein interactions.
- Detailed discussion of approaches to gene expression analysis for the diagnosis of diseases, the treatment of diseases, and the understanding of gene functions.
- Case studies on analysis of phylogenies, functional annotation of proteins, construction of purpose-built integrated biological databases, and development of workflows underlying the large-scale-effort gene discovery.

Contents: Molecular Biology for the Practical Bioinformatician; Strategy and Planning of Bioinformatics Experiments; Data Mining Techniques for the Practical Bioinformatician; Techniques for Recognition of Translation Initiation Sites; Neural-Statistical Model of TATA-Box Motifs in Eukaryotes; Tuning the Dragon Promoter Finder System for Human Promoter Recognition; RNA Secondary Structure Prediction; Protein Localization Prediction; Homology Search Methods; Analysis of Phylogeny: A Case Study on Saururaceae; Discovering Protein–Protein Interactions; Techniques for Analysis of Gene Expression; Technologies for Biological Data Integration; and other papers.

Readership: Computer scientists planning to be a bioinformatician.

Key Features

- Written in a practical, in-depth tutorial style
- Accessible to computer science undergraduates in their sophomore and/or senior years
- Covers a broad range of bioinformatics topics and of techniques used in bioinformatics
- Comprehensive overviews of the development of various approaches in a number of selected topics
- In-depth exposition of a number of important topics
- Contributions by prominent researchers: Vladimir Bajic, Ming Li, Kenta Nakai, Limsoon Wong, Cathy Wu, etc.
- Extensive, integrated references to background literature

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