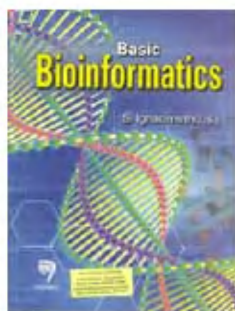


BOOK REVIEWS



Basic Bioinformatics. S. Ignacimuthu. Narosa Publishing House, 22 Daryaganj, New Delhi 110 002. 2005. 190 pp. Price: not mentioned.

Bioinformatics has now been recognized as an independent discipline and is extensively used by numerous researchers worldwide. Most researchers and analysts use bioinformatics software available through internet for analysing sequence and other experimental data. Numerous books on bioinformatics authored by many well-known academicians in this area, serve to teach students and professionals of the computational techniques of bioinformatics. Because bioinformatics is a vast field, the various presently available books mainly differ in the degree of coverage (breadth and depth). In this connection, the appearance of a basic book on bioinformatics is a welcome addition to the existing library. The primary objective of the book is good. Although its use is likely to be limited to first-year graduate students and new entrants of university teachers, I recommend this book for those who ask the question, 'What is bioinformatics?'

The preface starts with multiple definitions of bioinformatics, as is characteristic of this vast field. A general definition of bioinformatics is 'the application of the methods of computational techniques and technologies to analyse and maintain biological data'. I would have been more pleased if the author had supplied the history of bioinformatics starting from the period of Margaret Dayhoff, as nicely described by a well-known bioinformatician, E. N. Trifonov. I also noted with regret that reference to the discovery of triple helical structure of collagen by G. N. Ramachandran is missing. Students should be introduced to better historical perspectives to teach them to respect the dedication shown by early bioinformaticians. The first chapter covers important topics, but what struck me was the inclusion of

articles on drug design and Intellectual Property Rights (IPR) that are not commonly addressed in many books. This will increase students' awareness in IPR issues and the need to exercise caution with respect to ethical and legal issues in the realm of bioinformatics.

The subsequent chapters (2–4) cover the basics of computers, internet and world wide web, major databases, basics of molecular biology and widely used molecular biological techniques. The chapter on databases has been written well, considering that there are over 700 databases of various types (general and specialized). It is a monumental task to cover all databases in a single book. In this regard, the author has done well to introduce the reader to important or routinely used databases. I was also impressed by the web addresses provided by the author to enable the reader to immediately go to the website to obtain further information. Chapter 6 deals with a technique at the heart of bioinformatics: sequence alignment. The principles and the scoring matrices have been described well. Although this is an old area of research, it continues to be fascinating, because comparative sequence alignments can be accomplished in various ways to investigate different types of relationships. Chapter 7 deals with predictive methods using DNA and protein sequences. This is an important area and the author has covered important software used in this area. However, I regret to note that the contributions from Indian researchers have been ignored. Chapter 7 deals with homology, phylogeny and evolutionary trees. The basic concepts and definitions in this chapter have been addressed clearly and the important software package PHYLIP has been presented. Finally, the inclusion to chapter 9 on drug discovery and pharmainformatics is a welcome addition and some basic strategies used in this area have been presented. However, the readers should note that there are several strategies used in this important area and they should look into the reference list provided at the back and available from the literature as reviews or current opinions. The inclusion of a Glossary wraps up the book in a nicely presentable way. The study questions provided can help the readers to recapitulate well and this perhaps may relate to the rich experience of the author in teaching and writing articles. The text is smooth and presents itself for a pleasant reading. I would like to end with the cautionary note that this book should be used as an introduction to bioinformatics.

It offers limited help to the reader in answering the question 'How to do bioinformatics'. Perhaps, this aspect is beyond the scope of the book.

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Remote Sensing – Principles and Applications. B. C. Panda. Viva Books Pvt Ltd, 4262/3, Ansari Road, Daryaganj, New Delhi 110 002. 2005. 288 pp. Price: Rs 325.

Remote sensing started with observations at local or regional level of the earth's surface. Then, the technological achievements of three decades have provided tools with improved spatial, spectral and temporal resolutions for a variety of applications. One of the most important contributions has been to provide a synoptic view and detect changes. We stand to this opportunity to use it for sustainable resource management and environmental monitoring. Benefits of remote sensing have been applied at global, regional and local levels. Current-day remote sensing focuses on studying earth as a complex interactive system.

The Indian space programme aims at developing satellite systems for Indian needs driven towards national and social development. It has demonstrated wide applications, particularly in agriculture and soils, forestry, water resources and groundwater targetting, fisheries, land use, minerals and environmental assessment.

With the evolution of remote sensing science, the subject has been introduced at graduate and postgraduate levels by many universities. There is need for textbooks with

Indian examples of contemporary applications. From India, in the last decade a few books have been published on remote sensing, with emphasis ranging from fundamentals to applications; some highlighting atmospheric sensing/sounding and more on Indian satellite sensors and systems, etc. The present book by Panda is a good addition to this library. The book is intended to address the fundamentals for the students.

From the title of the book, the author intends to cover both fundamental principles and applications. However, it lacks sufficient treatment on applications. In all, there are eleven chapters focusing on the physics of remote sensing, energy interactions, remote sensing platforms, data acquisition, information extraction procedures, complimentary spatial technologies and applications. Panda, being a teacher, has basic aspects at one place with his own presentation skills and articulations. The presentations are simple, brief and address the issues the author wanted to present. Illustrations in the book are compiled from different sources, but go well with the text to support understanding. To provide acronyms and glossary is again a good initiative and will facilitate students. Literature cited is just adequate for a beginner, though not as latest as one would expect in the age of internet.

As introduction to remote sensing, target's signals interaction has dealt with the optical and microwave regions. Conspicuous by its absence is the discussion on signal emission in thermal IR region and the concept of thermal inertia. The chapter on sensors and platforms is brief, only popular sensors are discussed. Data acquisition and dissemination are dealt with routinely. Some of the topics such as Landsat data communication and processing systems are archaic in today's context. Some of the technologies used currently for handling large data rates and volumes, for example for Resourcesat, TES, etc. could have been presented. Also the data dissemination to users has undergone tremendous transformation by way of internet and FTP (file transfer protocol) usage. In chapter 7, on 'the sensing', data handling, processing for image enhancement and analysis for information extraction have been discussed, end to end, in a simple manner.

Sufficient coverage and depth have been given to image statistics, image enhancement by histogram manipulation, spectral and spatial transforms and colour trans-

forms. Besides discussion on Tasseled Cap transform with Landsat 1, 2 and 4 satellite data, more coverage on indices for vegetation, snow, soil moisture, urban, etc. could have been provided. Similarly, value addition could have been provided on remote sensing analysis by briefly touching upon evaluation of classification results with inclusion of post-classification analysis covering error/confusion matrix, etc.

The radar remote sensing is dealt with in detail in the chapter on imaging principles. Radar systems provided are the initial microwave systems. A major thrust to the radar remote sensing and its applications has come with the launch of operational radar satellites, viz. ERS-1 & 2 and JERS-1, SIR-C, Radarsat-1 and Envisat in the last decade with major improvements in the data acquisition modes. The author could have included them for the benefit of the reader. Similarly, discussion on image distortions, speckle and its filtering, and radar data processing could have been touched upon.

In the third category of topics covered, principles of GPS and error sources are discussed with basic exposure. However, it was overlooked by the author to mention that the practice of bringing down the accuracy in C/A code by arbitrarily introducing error was given up by the GPS operator. Principles of GIS have been covered with discussion on spatial data representation, GIS functions, linkage between remote sensing and GIS. The present-day GIS is much advanced and should address interoperability, open GIS consortium concepts, data communication/dissemination, visualization and decision support systems.

Though the book title includes applications, the author could only provide generic description of the application potential of satellite remote sensing, specially on themes like agriculture, water resources, landuse/land-cover image, geologic hazard-zone mapping and monitoring, etc. The chapter is just enough to provide a bird's-view of applications.

Panda has devoted about three decades in agricultural physics. I wish he could have covered extensively his areas of application. The students would have greatly benefitted with his research experience. As I scanned the book, I found that some grammatical and conceptual improvements were needed (For example, Preface lines 1, 2, 12, 14, p. 87 last two sentences, p. XXIV description of plate 13). Also, there

are some mistakes (e.g. p. 34, lines 7, 9, 11-K to be replaced by L). Nevertheless, the book has the potential to serve as a textbook for graduate level students, within reasonable cost. As the author mentioned, this book would add to the collection of textbooks on remote sensing and provides a good introduction to the subject chosen.

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Global Change in the Holocene. Anson Mackay *et al.* (eds) Hodder Arnold, London. 2005. 528 pp. Price: US\$ 55.00.

This book is an outcome of the European Union Advanced Study Course conducted at the University College, London. The book is intended to cater to the needs of students who have recently been initiated into Holocene studies and also of postdoctoral scholars. The Holocene period covers the past 11,500 years of earth's history. This period saw the development and collapse of complex societies and civilizations, and also saw the emergence of agriculture. The Holocene was largely thought to be mundane in terms of climatic variability, as the earlier views were based on data from Greenland ice-core records. Gradually, as more palaeoclimatic records from around the globe were reconstructed, it became clear that this was indeed not the case. The excitement for Holocene research comes from the need to understand climate variability over longer time-scales, beyond the instrumental record. Palaeoclimatic records from the Holocene provide a test for models aiming to predict futuristic scenarios under elevated greenhouse gas concentrations. A book addressing Holocene research would thus be expected to cover the following themes: Processes controlling climate variability; Chronological techniques; Methods of reconstructing past climate change using physical, chemical and biological indicators; Climate change simulations and future predictions; and Material/deposits suitable for reconstruction of past climate change.

And, this is precisely what the book does. In the preface, the editors define the struc-