

Preface

This little book attempts to give a self-contained account of bioinformatics, so that the newcomer to the field may, whatever his point of departure, gain a rather complete overview. At the same time it makes no claim to be comprehensive: The field is already too vast—and let it be remembered that although its recognition as a distinct discipline (i.e., one after which departments and university chairs are named) is recent, its roots go back a long time.

Given that many of the newcomers arrive from either biology or informatics, it was an obvious consideration that for the book to achieve its aim of completeness, large portions would have to deal with matter already known to those with backgrounds in either of those two fields; that is, in the particular chapters dealing with them, the book would provide no information for them. Since such chapters could hardly be omitted, I have tried to consider such matter in the light of bioinformatics as a whole, so that even the student ostensibly familiar with it could benefit from a fresh viewpoint.

In one regard especially, this book cannot be comprehensive. The field is developing extraordinarily rapidly and it would have been artificial and arbitrary to take a snapshot of the details of contemporary research. Hence I have tried to focus on a thorough grounding of concepts, which will enable the student not only to understand contemporary work but should also serve as a springboard for his or her own discoveries. Much of the raw material of bioinformatics is open and accessible to all via the internet, powerful computing facilities are ubiquitous, and we may be confident that vast tracts of the field lie yet uncultivated. This accessibility extends to the literature: Research papers on any topic can usually be found rapidly by an internet search and, therefore, I have not aimed at providing a comprehensive bibliography.

In bioinformatics, so much is to be done, the raw material to hand is already so vast and vastly increasing, and the problems to be solved are so important (perhaps the most important of any science at present), we may be entering an era comparable to the great flowering of quantum mechanics in the first three decades of the twentieth century, during which there were periods when practically every doctoral thesis was a major breakthrough. If this book is able to inspire the student to take up some of the challenges, then it will have accomplished a large part of what it sets out to do.

Indeed, I would go further to remark that I believe that there are still comparatively simple things to be discovered and that many of the present directions of work in the field may turn out not to be right. Hence, at this stage in its development the most important thing is to illuminate that viewpoint that will facilitate new discoveries. This belief also underlies the somewhat more detailed coverage of the biological processes in which information processing in nature is embodied than might be considered customary.

A work of this nature depends on a long history of interactions, discussions, and correspondence with many present and erstwhile friends and colleagues, some of whom, sadly, are no longer alive. I have tried to reflect some of this debt in the citations. Furthermore, many scientific subjects and methods other than those mentioned in the text had to be explored before the ones best suited to the purpose of this work could be selected, and my thanks are due to all those who helped in these preliminary studies. I should like to add an especial word of thanks to Victoria Kechehmadze for having so ably drawn the figures.

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