

PREFACE

This book has been constructed primarily as a textbook for a one- or two-semester course in statistical bioinformatics. We hope that it will first serve as a comprehensive introduction to a broad range of topics in this area for life science students and researchers who are motivated to learn statistical analysis concepts and techniques in bioinformatics. Statistical and quantitative science audiences who have not yet dealt with challenging statistical issues in recent information-rich biological and biomedical data analysis may also benefit from this book by efficiently reviewing the different statistical concepts and techniques in such analyses. In particular, the four separate blocks in this book—statistical foundation, high-dimensional analysis, advanced topics, and multigene systems analysis—can be somewhat independently studied and taught in a course based on relevant needs and time restrictions for an effective learning purpose.

A similar outline as organized in this book has been used for several years in a one-semester graduate course which is open to students with diverse backgrounds at the University of Virginia. By publishing this book, we felt that these contents could be significantly enhanced by direct contributions of more specialized experts in the broad field of bioinformatics. In this multiauthor book, we have yet tried to maintain the need of a high-level mathematical and statistical understanding at a minimum. Readers of this book are thus assumed to have not much more than a basic college calculus level of mathematical understanding. A knowledge of matrix algebra would also be useful but is not a prerequisite.

This book is certainly a tribute to the contributions and support of many people. Acknowledgments are first due to the succeeding life science editors of John Wiley & Sons: Luna Han, Thomas Moore, and Karen Chambers. Without their continuous support and encouragement, the publication of this book would not have been possible. Also, all the efforts made by the expert authors who were willing to participate in this book should be highly acknowledged for its successful completion. Finally, the students who have taken this initial course and provided valuable feedback on various topics in this area over the last several years are also significant contributors to the current form of the book. The preparation of this book was supported in part by the National Institutes of Health Research Grant R01 HL081690.

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