Analysis Of Multivariate Survival Data

The aim of this book is to bridge the gap between standard textbook models and a range of models where the dynamic structure of the data manifests itself fully. The common denominator of such models is stochastic processes. The authors show how counting processes, martingales, and stochastic integrals fit very nicely with censored data. Beginning with standard analyses such as Kaplan-Meier plots and Cox regression, the presentation progresses to the additive hazard model and recurrent event data. Stochastic processes are also used as natural models for individual frailty; they allow sensible interpretations of a number of surprising artifacts seen in population data. The stochastic process framework is naturally connected to causality. The authors show how dynamic path analyses can incorporate many modern causality ideas in a framework that takes the time aspect seriously. To make the material accessible to the reader, a large number of practical examples, mainly from medicine, are developed in detail. Stochastic processes are introduced in an intuitive and non-technical manner. The book is aimed at investigators who use event history methods and want a better understanding of the statistical concepts. It is suitable as a textbook for graduate courses in statistics and biostatistics.

A practical guide to methods of survival analysis for medical researchers with limited statistical experience. Methods and techniques described range from descriptive and exploratory analysis to multivariate regression methods. Uses illustrative data from actual clinical trials and observational studies to describe methods of analysing and reporting results. Also reviews the features and performance of statistical software available for applying the methods of analysis discussed.

Multivariate Survival Analysis and Competing Risks introduces univariate survival analysis and extends it to the multivariate case. It covers competing risks and counting processes and provides many real-world examples, exercises, and R code. The text discusses survival data, survival distributions, frailty models, parametric methods, multivariate data and distributions, copulas, continuous failure, parametric likelihood inference, and non- and semi-parametric methods. There are many books covering survival analysis, but very few that cover the multivariate case in any depth. Written for a graduate-level audience in statistics/biostatistics, this book includes practical exercises and R code for the examples. The author is renowned for his clear writing style, and this book continues that trend. It is an excellent reference for graduate students and researchers looking for grounding in this burgeoning field of research.

The concept of frailty offers a convenient way to introduce unobserved heterogeneity and associations into models for survival data. In its simplest form, frailty is an unobserved random proportionality factor that modifies the hazard function of an individual or a group of related individuals. Frailty Models in Survival Analysis presents a comprehensive overview of the fundamental approaches in the area of frailty models. The book extensively explores how univariate frailty models can represent unobserved heterogeneity. It also emphasizes correlated frailty models as extensions of univariate and shared frailty models. The author analyzes similarities and differences between frailty and copula models; discusses problems related to frailty models, such as tests for homogeneity; and describes parametric and semiparametric models using both frequentist and Bayesian approaches. He also shows how to apply the models to real data using the statistical packages of R, SAS, and Stata. The appendix provides the technical mathematical results used throughout. Written in nontechnical terms accessible to nonspecialists, this book explains the basic ideas in frailty modeling and statistical techniques, with a focus on real-world data application and interpretation of the results. By applying several models to the same data, it allows for the comparison of their advantages and limitations under varying model assumptions. The book also employs simulations to analyze the finite sample size performance of the models.

Future Risk After an Attempted Suicide

Frailty Models in Survival Analysis

Statistical Models Based on Counting Processes

Analysis of Multivariate Survival Data from Longitudinal Epidemiological Studies

Copula-Based Approaches

Human Genetics concerns the study of genetic forces in man. By studying our genetic make-up we are able to understand more about our heritage and evolution. Some of the original, and most significant research in genetics centred around the study of the genetics of complex diseases - genetic epidemiology. This is the third in a highly successful series of books based on articles from the Encyclopedia of Biostatistics. This volume will be a timely and comprehensive reference, for a subject that has seen a recent explosion of interest following the completion of the first draft of the Human Genome Mapping Project. The editors have updated the articles from the Human Genetics section of the EoB, have adpated other articles to give them a genetic feel, and have included a number of newly commissioned articles to ensure the work is comprehensive and provides a self-contained reference.

This book introduces readers to advanced statistical methods for analyzing survival data involving correlated endpoints. In particular, it describes statistical methods for applying Cox regression to two correlated endpoints by accounting for dependence between the endpoints with the aid of copulas. The practical advantages of employing copula-based models in medical research are explained on the basis of case studies. In addition, the book focuses on clustered survival data, especially data arising from meta-analysis and multicenter analysis. Consequently, the statistical approaches presented here employ a frailty term for heterogeneity modeling. This brings the joint frailty-copula model, which incorporates a frailty term and a copula, into a statistical model. The book also discusses advanced techniques for dealing with high-dimensional gene expressions and developing personalized dynamic prediction tools under the joint frailty-copula model. To help readers apply the statistical methods to real-world data, the book provides case studies using the authors' original R software package (freely available in CRAN). The emphasis is on clinical survival data, involving time-to-tumor progression and overall survival, collected on cancer patients. Hence, the book offers an essential reference guide for medical statisticians and provides researchers with advanced, innovative statistical tools. The book also provides a concise introduction to basic multivariate survival models.

With an emphasis on social science applications, Event History Analysis with R, Second Edition, presents an introduction to survival and event history analysis using real-life examples. Since publication of the first edition, focus in the field has gradually shifted towards the analysis of large and complex datasets. This has led to new ways of tabulating and analysing tabulated data with the same precision and power as that of an analysis of the full data set. Tabulation also makes it possible to share sensitive data with others without violating integrity. The new edition extends on the content of the first by both improving on already given methods and introducing new methods. There are two new chapters, Explanatory Variables and Regression, and Register- Based Survival Data Models. The book has been restructured to improve the flow, and there are significant updates to the computing in the supporting R package. Features • Introduction to survival and event history analysis and how to solve problems with incomplete data using Cox regression. • Parametric proportional hazards models, including the Weibull, Exponential, Extreme Value, and Gompertz distributions. • Parametric accelerated failure time models with the Lognormal, Loglogistic, Gompertz, Exponential, Extreme Value, and Weibull distributions. • Proportional hazards models for occurrence/exposure data, useful with tabular and register based data, often with a huge amount of observed events. • Special treatments of external communal covariates, selections from the Lexis diagram, and creating period as well as cohort statistics. • “Weird bootstrap” sampling suitable for Cox regression with small to medium-sized data sets. • Supported by an R package (https://CRAN.R-project.org/package=eha), including code and data for most examples in the book. • A dedicated home page for the book at http://ehar.se/r/ehar2 This substantial update to this popular book remains an excellent resource for researchers and practitioners of applied event history analysis and survival analysis. It can be used as a text for a course for graduate students or for self-study.

Multivariate Survival Analysis and Competing Risks introduces univariate survival analysis and extends it to the multivariate case. It covers competing risks and counting processes and provides many real-world examples, exercises, and R code. The text discusses survival data, survival distributions, frailty models, parametric methods, multivariate

A Marginal Modeling Approach

Models and Applications

Cure Models for Univariate and Multivariate Survival Data

Statistical Methods for Survival Data Analysis

Topics in Survival Analysis

Survival analysis concerns sequential occurrences of events governed by probabilistic laws. Recent decades have witnessed many applications of survival analysis in various disciplines. This book introduces both classic survival models and theories along with newly developed techniques. Readers will learn how to perform analysis of survival data by following numerous empirical illustrations in SAS. Survival Analysis: Models and Applications: Presents basic techniques before leading onto some of the most advanced topics in survival analysis. Assumes only a minimal knowledge of SAS whilst enabling more experienced users to learn new techniques of data input and manipulation. Provides numerous examples of SAS code to illustrate each of the methods, along with step-by-step instructions to perform each technique. Highlights the strengths and limitations of each technique covered. Covering a wide scope of survival techniques and methods, from the introductory to the advanced, this book can be used as a useful reference book for planners, researchers, and professors who are working in settings involving various lifetime events. Scientists interested in survival analysis should find it a useful guidebook for the incorporation of survival data and methods into their projects.

Analysis of Multivariate Survival DataSpringer

Functions of survival time; Examples of survival data analysis; Nonparametric methods of estimating survival functions; Nonparametric methods for comparing survival distributions; Some well-known survival distributions and their applications; Graphical methods for sulvival distribution fitting and goodness-of-fit tests; Analytical estimation procedures for sulvival distributions; Parametric methods for comparing two survival distribution; Identification of prognostic factors related to survival time; Identification of risk factors related to dichotomous data; Planning and design of clinical trials (I); Planning and design of clinicL trials(II).

Making complex methods more accessible to applied researchers without an advanced mathematical background, the authors present the essence of new techniques available, as well as classical techniques, and apply them to data. Practical suggestions for implementing the various methods are set off in a series of practical notes at the end of each section, while technical details of the derivation of the techniques are sketched in the technical notes. This book will thus be useful for investigators who need to analyse censored or truncated life time data, and as a textbook for a graduate course in survival analysis, the only prerequisite being a standard course in statistical methodology.

Modeling Survival Data Using Frailty Models

Multivariate Survival Analysis for Split Populations with Application to Patterns of Domestic Violence

Handbook of Survival Analysis

An Introduction to Survival Analysis Using Stata, Second Edition

Analysis of Survival Data with Dependent Censoring

Readers will find in the pages of this book a treatment of the statistical analysis of clustered survival data. Such data are encountered in many scientific disciplines including human and veterinary medicine, biology, epidemiology, public health and demography. A typical example is the time to death in cancer patients, with patients clustered in hospitals. Frailty models provide a powerful tool to analyze clustered survival data. In this book different methods based on the frailty model are described and it is demonstrated how they can be used to analyze clustered survival data. All programs used for these examples are available on the Springer website.

The Statistical Analysis of Multivariate Failure Time Data: A Marginal Modeling Approach provides an innovative look at methods for the analysis of correlated failure times. The focus is on the use of marginal single and marginal double failure hazard rate estimators for the extraction of regression information. For example, in a context of randomized trial or cohort studies, the results go beyond that obtained by analyzing each failure time outcome in a univariate fashion. The book is addressed to researchers, practitioners, and graduate students, and can be used as a reference or as a graduate course text. Much of the literature on the analysis of censored correlated failure time data uses frailty or copula models to allow for residual dependencies among failure times, given covariates. In contrast, this book provides a detailed account of recently developed methods for the simultaneous estimation of marginal single and dual outcome hazard rate regression parameters, with emphasis on multiplicative (Cox) models. Illustrations are provided of the utility of these methods using Women ' s Health Initiative randomized controlled trial data of menopausal hormones and of a low-fat dietary pattern intervention. As byproducts, these methods provide flexible semiparametric estimators of pairwise bivariate survivor functions at specified covariate histories, as well as semiparametric estimators of cross ratio and concordance functions given covariates. The presentation also describes how these innovative methods may extend to handle issues of dependent censorship, missing and mismeasured covariates, and joint modeling of failure times and covariates, setting the stage for additional theoretical and applied developments. This book extends and continues the style of the classic Statistical Analysis of Failure Time Data by Kalbfleisch and Prentice. Ross L. Prentice is Professor of Biostatistics at the Fred Hutchinson Cancer Research Center and University of Washington in Seattle, Washington. He is the recipient of COPSS Presidents and Fisher awards, the AACR Epidemiology/Prevention and Team Science awards, and is a member of the National Academy of Medicine. Shanshan Zhao is a Principal Investigator at the National Institute of Environmental Health Sciences in Research Triangle Park, North Carolina.

Survival analysis is a highly active area of research with applications spanning the physical, engineering, biological, and social sciences. In addition to statisticians and biostatisticians, researchers in this area include epidemiologists, reliability engineers, demographers and economists. The economists survival analysis by the name of duration analysis and the analysis of transition data. We attempted to bring together leading researchers, with a common interest in developing methodology in survival analysis, at the NATO Advanced Research Workshop. The research works collected in this volume are based on the presentations at the Workshop. Analysis of survival experiments is complicated by issues of censoring, where only partial observation of an individual's life length is available and left truncation, where individuals enter the study group if their life lengths exceed a given threshold time. Application of the theory of counting processes to survival analysis, as developed by the Scandinavian School, has allowed for substantial advances in the procedures for analyzing such experiments. The increased use of computer intensive solutions to inference problems in survival analysis~ in both the classical and Bayesian settings, is also evident throughout the volume. Several areas of research have received special attention in the volume.

Modern survival analysis and more general event history analysis may be effectively handled within the mathematical framework of counting processes. This book presents this theory, which has been the subject of intense research activity over the past 15 years. The exposition of the theory is integrated with careful presentation of many practical examples, drawn almost exclusively from the authors'own experience, with detailed numerical and graphical illustrations. Although Statistical Models Based on Counting Processes may be viewed as a research monograph for mathematical statisticians and biostatisticians, almost all the methods are given in concrete detail for use in practice by other mathematically oriented researchers studying event histories (demographers, econometricians, epidemiologists, actuarial mathematicians, reliability engineers and biologists). Much of the material has so far only been available in the journal literature (if at all), and so a wide variety of researchers will find this an invaluable survey of the subject.

Bayesian Transformation Models for Multivariate Survival Analysis with Applications in Large Data

Selected Papers

Multivariate Dependencies in Survival Analysis

Multivariate Survival Analysis and Intensity Regression of Data from Stockholm County, Sweden

Survival Analysis with Correlated Endpoints

Using real data sets throughout, Survival Analysis in Medicine and Genetics introduces the latest methods for analyzing high-dimensional survival data. It provides thorough coverage of recent statistical developments in the medical and genetics fields. The text mainly addresses special concerns of the survival model. After covering the fundamentals, it discusses interval censoring, nonparametric and semiparametric hazard regression, multivariate survival data analysis, the sub-distribution method for competing risks data, the cure rate model, and Bayesian inference methods. The authors then focus on time-dependent diagnostic medicine and high-dimensional genetic data analysis. Many of the methods are illustrated with clinical examples. Emphasizing the applications of survival analysis techniques in genetics, this book presents a statistical framework for burgeoning research in this area and offers a set of established approaches for statistical analysis. It reveals a new way of looking at how predictors are associated with censored survival time and extracts novel statistical genetic methods for censored survival time outcome from the vast amount of research results in genomics.

This dissertation, "Topics in Survival Analysis" by Kwok-fai, Lam, □□□, was obtained from The University of Hong Kong (Pokfulam, Hong Kong) and is being sold pursuant to Creative Commons: Attribution 3.0 Hong Kong License. The content of this dissertation has not been altered in any way. We have altered the formatting in order to facilitate the ease of printing and reading of the dissertation. All rights not granted by the above license are retained by the author. Abstract: Abstract of thesis entitled "TOPICS IN SURVIVAL ANALYSIS" Submitted by Kwok-fai LAM For the Degree of Doctor of Philosophy at The University of Hong Kong in June 1994 This thesis deals with the modelling and analysis of failure time data and is divided into four main topics in survival analysis. In modelling proportion of immunes or surviving fraction in a population, it is common to assume a mixture model which combines a logistic regression model and a positive distribution. In some applications, the model may not be appropriate especially in the presence of heterogeneity among individuals in subpopulations. It is shown that frailty or random effects model can also be used in such situations provided that the frailty distribution has a discrete mass at zero, and the mixture model mentioned is only a special case of the frailty model representations when the frailty term has a logistic regression model. Examples of some frailty distributions and their relative merits are discussed in the first topic. It is well known that frailty models can also be used to generate dependent multivariate survival distributions. A large number of estimation methods have been proposed in the literature, most of them depend on specific dis- tributional assumptions for the frailties. The second topic advocates the marginal likelihood approach as a unified approach to parameter estimation in frailty models for multivariate survival data analysis. As it is impossible to evaluate the marginal likelihood function analytically, two Monte Carlo approximations are proposed, and the frailty prediction by Monte Carlo em- pirical Bayes approach is also considered. Two classes of multivariate non-parametric tests are proposed for testing the equality of failure rates in a competing risks setup, which turns out to be of equivalent form. Optimal weight functions which yield optimal local asymptotic power for certain alternative hypotheses are considered for the two classes, and a more empirical way of choosing weight function in application to a data set is illustrated with an example in the third topic. The last topic deals with a special type of multivariate survival data which can be represented by a compartmental model or the so-called illness and death model. A non-parametric inference procedure in estimating the cumulative rate of morbidity of a certain disease is proposed with the time to onset of the disease being unobservable, which is generally true in real life. General difficulties for such models are also discussed. ii DOI: 10.5353/th_b3040899 Subjects: Survival analysis (Biometry) Failure time data analysis

This dissertation, "Cure Models for Univariate and Multivariate Survival Data" by Feifei, Zhou, □□□, was obtained from The University of Hong Kong (Pokfulam, Hong Kong) and is being sold pursuant to Creative Commons: Attribution 3.0 Hong Kong License. The content of this dissertation has not been altered in any way. We have altered the formatting in order to facilitate the ease of printing and reading of the dissertation. All rights not granted by the above license are retained by the author. DOI: 10.5353/th_b4570097 Subjects: Survival analysis (Biometry) Multivariate analysis

Analysis of Failure and Survival Data is an essential textbook for graduate-level students of survival analysis and reliability and a valuable reference for practitioners. It focuses on the many techniques that appear in popular software packages, including plotting product-limit survival curves, hazard plots, and probability plots in the context of censored data. The author integrates S-Plus and Minitab output throughout the text, along with a variety of real data sets so readers can see how the theory and methods are applied. He also incorporates exercises in each chapter that provide valuable problem-solving experience. In addition to all of this, the book also brings to light the most recent linear regression techniques. Most importantly, it includes a definitive account of the Buckley-James method for censored linear regression, found to be the best performing method when a Cox proportional hazards method is not appropriate. Applying the theories of survival analysis and reliability requires more background and experience than students typically receive at the undergraduate level. Mastering the contents of this book will help prepare students to begin performing research in survival analysis and reliability and provide seasoned practitioners with a deeper understanding of the field.

Bayesian Analysis of Univariate and Multivariate Survival Data with Special Reference to Dynamic Generalized Linear Models

Statistical Modelling in Biostatistics and Bioinformatics

Survival Analysis in Medicine and Genetics

With Special Reference to the Impact of Routine Immunisations in Infancy

Survival data or more general time-to-event data occur in many areas, including medicine, biology, engineering, economics, and demography, but previously standard methods have requested that all time variables are univariate and independent. This book extends the field by allowing for multivariate times. As the field is rather new, the concepts and the possible types of data are described in detail. Four different approaches to the analysis of such data are presented from an applied point of view.

This book presents the basic concepts of survival analysis and frailty models, covering both fundamental and advanced topics. It focuses on applications of statistical tools in biology and medicine, highlighting the latest frailty-model methodologies and applications in these areas. After explaining the basic concepts of survival analysis, the book goes on to discuss shared, bivariate, and correlated frailty models and their applications. It also features nine datasets that have been analyzed using the R statistical package. Covering recent topics, not addressed elsewhere in the literature, this book is of immense use to scientists, researchers, students and teachers.

Survival analysis arises in many fields of study including medicine, biology, engineering, public health, epidemiology, and economics. This book provides a comprehensive treatment of Bayesian survival analysis. It presents a balance between theory and applications, and for each class of models discussed, detailed examples and analyses from case studies are presented whenever possible. The applications are all from the health sciences, including cancer, AIDS, and the environment.

"[This book] provides new researchers with the foundation for understanding the various approaches for analyzing time-to-event data. This book serves not only as a tutorial for those wishing to learn survival analysis but as a ... reference for experienced researchers ..."--Book jacket.

Microcomputer-assisted Multivariate Survival Data Analysis Using Cox's Proportional Hazards Regression Model

Construction and Application of Customised Computer Software for the Analysis of Data Generated from Studies of Recidivism with Covariates to Accommodate the Detection of Demotivation and Right-censoring Mechanism

Analysis of Failure and Survival Data

The Statistical Analysis of Multivariate Failure Time Data

Bayesian Survival Analysis

This dissertation, "Modelling Multivariate Survival Data Using Semiparametric Models" by □□□, Yau-wing, Lee, was obtained from The University of Hong Kong (Pokfulam, Hong Kong) and is being sold pursuant to Creative Commons: Attribution 3.0 Hong Kong License. The content of this dissertation has not been altered in any way. We have altered the formatting in order to facilitate the ease of printing and reading of the dissertation. All rights not granted by the above license are retained by the author. DOI: 10.5353/th_b4257528 Subjects: Survival analysis (Biometry) Multivariate analysis Medicine - Research - Statistical methods

Handbook of Survival Analysis presents modern techniques and research problems in lifetime data analysis. This area of statistics deals with time-to-event data that is complicated by censoring and the dynamic nature of events occurring in time. With chapters written by leading researchers in the field, the handbook focuses on advances in survival analysis techniques, covering classical and Bayesian approaches. It gives a complete overview of the current status of survival analysis and should inspire further research in the field. Accessible to a wide range of readers, the book provides: An introduction to various areas in survival analysis for graduate students and novices A reference to modern investigations into survival analysis for more established researchers A text or supplement for a second or advanced course in survival analysis A useful guide to statistical methods for analyzing survival data experiments for practicing statisticians

The papers in this volume discuss important methodological advances in several important areas, including multivariate failure time data and interval censored data. The book will be an indispensable reference for researchers and practitioners in biostatistics, medical research, and the health sciences.

Index. Subject index -- Author index

Multivariate survival analysis methods for mapping genes for complex diseases

Univariate and Multivariate Survival Models with Flexible Hazard Functions

1993

Survival Analysis: State of the Art

A Process Point of View

This is the sixth edition of a popular textbook on multivariate analysis. Well-regarded for its practical and accessible approach, with excellent examples and good guidance on computing, the book is particularly popular for teaching outside statistics, i.e. in epidemiology, social science, business, etc. The sixth edition has been updated with a new chapter on data visualization, a distinction made between exploratory and confirmatory analyses and a new section on generalized estimating equations and many new updates throughout. This new edition will enable the book to continue as one of the leading textbooks in the area, particularly for non-statisticians. Key Features: Provides a comprehensive, practical and accessible introduction to multivariate analysis. Keeps mathematical details to a minimum, so particularly geared toward a non-statistical audience. Includes lots of detailed worked examples, guidance on computing, and exercises. Updated with a new chapter on data visualization.

This book introduces readers to copula-based statistical methods for analyzing survival data involving dependent censoring. Primarily focusing on likelihood-based methods performed under copula models, it is the first book solely devoted to the problem of dependent censoring. The book demonstrates the advantages of the copula-based methods in the context of medical research, especially with regard to cancer patients' survival data. Needless to say, the statistical methods presented here can also be applied to many other branches of science, especially in reliability, where survival analysis plays an important role. The book can be used as a textbook for graduate coursework or a short course aimed at (bio-) statisticians. To deepen readers' understanding of copula-based approaches, the book provides an accessible introduction to basic survival analysis and explains the mathematical foundations of copula-based survival models.

Our research focuses on exploring and developing flexible Bayesian methodologies to model both univariate and multivariate survival data. When developing a Bayesian survival model, the most desirable properties are often flexibility of hazard functions, a proper posterior distribution and efficient implementation. The novelty of our work can be classified into three sections: first, we introduce a new distribution to model univariate and bivariate survival data. Although extreme value theory and subsequently the Generalized Extreme Value (GEV) distribution have been explored in the past to model rare events, our work is the first of its kind to extend GEV framework into the foray of survival analysis. We develop a cure rate model and apply it to various types of univariate cancer survival data. Second, we provide a novel method of estimating the copula association parameter for bivariate survival data using an empirical Bayes approach. Lastly we propose a novel Bayesian R-Vine approach to model multivariate survival data. The thesis consists of five chapters. Chapter 1 introduces the problem of survival data analysis and provides a brief overview of both the frequentist and Bayesian methods developed over the past few decades. Chapter 2 briefly introduces the univariate extreme value analysis. In Chapter 3, we use both forms of the GEV distribution, the Maxima and the Minima to develop a Bayesian modeling technique to analyze right-censored log survival data for populations with a surviving fraction. Next in Chapter 4, we consider bivariate survival data and use copula structures to model the association between the survival times. A novel empirical Bayesian method for estimating the copula function has been proposed. Using our model, we enable the user to use different copula functions to model the same data and hence introduce the concept of copula choice using the Bayesian model selection approach. We demonstrate through extensive simulations that the empirical Bayesian approach provides tighter HPD intervals for the copula parameter of association as compared to full Bayesian and two-stage estimation procedures. Lastly, chapter 5 introduces a novel approach to model multivariate survival data using a Bayesian R-vine copula approach. We show that this method provides flexibility and easy computation even for dimensions 3 and higher as compared to direct extension of bivariate copula families to multivariate dimensions.

This thesis investigates determinants of factors associated with retention of injecting drug users on the South Australian methadone program over the decade 1981 to mid 1991. Truncated multivariate survival models are proposed for the analysis of data from the program, and the theory of graphical chain models applied to the data. A detailed analysis is presented which gives further insight into the nature of the relationships that exist amongst these data. This provides an application of graphical chain models to survival data.

Second Edition

Techniques for Censored and Truncated Data

Proceedings of the First Seattle Symposium in Biostatistics: Survival Analysis

Contemporary Multivariate Analysis and Design of Experiments

Multivariate Survival Analysis and Competing Risks

This book presents selected papers on statistical model development related mainly to the fields of Biostatistics and Bioinformatics. The coverage of the material falls squarely into the following categories: (a) Survival analysis and multivariate survival analysis, (b) Time series and longitudinal data analysis, (c) Statistical model development and (d) Applied statistical modelling. Innovations in statistical modelling are presented throughout each of the four areas, with some intriguing new ideas on hierarchical generalized non-linear models and on frailty models with structural dispersion, just to mention two examples. The contributors include distinguished international statisticians such as Philip Hougaard, John Hinde, Il Do Ha, Roger Payne and Alessandra Durio, among others, as well as promising newcomers. Some of the contributions have come from researchers working in the BIO-SI research programme on Biostatistics and Bioinformatics, centred on the Universities of Limerick and Galway in Ireland and funded by the Science Foundation Ireland under its Mathematics Initiative.

Analysis of Multivariate Survival Data

Modelling Multivariate Survival Data Using Semiparametric Models

Joint Frailty-Copula Models

Analysing Survival Data from Clinical Trials and Observational Studies

Survival and Event History Analysis