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An Introduction to Bayesian Inference, Methods and Computation Causal Inference in Statistics, Social, and Biomedical Sciences *Theoretical Statistics* An Introduction to Causal Inference Statistical Inference Via Convex Optimization Introduction to Statistical Inference *All of Statistics* Instructor's Notes, Course 182, Military Justice, Naval Reserve Officers School The Likelihood Principle Computer Age Statistical Inference Introduction to the Theory of Statistical Inference Statistical Inference Statistical Inference for Engineers and Data Scientists *Bayesian Data Analysis, Third Edition* Maximum Likelihood Estimation and Inference Statistical Inference Via Data Science Statistical Inference A First Course in Statistical Inference Statistical Inference *Statistical Inference* Mathematical Statistics Tools for Statistical Inference Asymptotic Theory of Statistical Inference *Introduction to Probability Probabilistic Graphical Models Fundamentals of Causal Inference Nonparametric and Semiparametric Models* Parametric and Nonparametric Inference from Record-Breaking Data Ecological Statistics *Information Theory, Inference and Learning Algorithms Probabilistic Machine Learning* Signals, Systems and Inference, Global Edition *Statistical Inference from Genetic Data on Pedigrees* Statistical Rethinking Inference and Anticipation in Simultaneous Interpreting Machine Learning Principles of Statistical Inference Probability and Statistical Inference Essential Statistical Inference Inference and Consciousness

Parametric and Nonparametric Inference from Record-Breaking Data Jul 09 2020 By providing a comprehensive look at statistical inference from record-breaking data in both parametric and nonparametric settings, this book treats the area of nonparametric function estimation from such data in detail. Its main purpose is to fill this void on general inference from record values. Statisticians, mathematicians, and engineers will find the book useful as a research reference. It can also serve as part of a graduate-level statistics or mathematics course.

Probabilistic Graphical Models Oct 12 2020 A general framework for constructing and using probabilistic models of complex systems that would enable a computer to use available information for making decisions. Most tasks require a person or an automated system to reason—to reach conclusions based on available information. The framework of probabilistic graphical models, presented in this book, provides a general approach for this task. The approach is model-based, allowing interpretable models to be constructed and then manipulated by reasoning algorithms. These models can also be learned automatically from data, allowing the approach to be used in cases where manually constructing a model is difficult or even impossible. Because uncertainty is an inescapable aspect of most real-world applications, the book focuses on probabilistic models, which make the uncertainty explicit and provide models that are more faithful to reality. Probabilistic Graphical Models discusses a variety of models, spanning Bayesian networks, undirected Markov networks, discrete and continuous models, and extensions to deal with dynamical systems and relational data. For each class of models, the text describes the three fundamental cornerstones: representation, inference, and learning, presenting both basic concepts and advanced techniques. Finally, the book considers the use of the proposed framework for causal reasoning and decision making under uncertainty. The main text in each chapter provides the detailed technical development of the key ideas. Most chapters also include boxes with additional material: skill boxes, which describe techniques; case study boxes, which discuss empirical cases related to the approach described in the text, including applications in computer vision, robotics, natural language understanding, and computational biology; and concept boxes, which present significant concepts drawn from the material in the chapter. Instructors (and readers) can group

chapters in various combinations, from core topics to more technically advanced material, to suit their particular needs.

Bayesian Data Analysis, Third Edition Sep 22 2021 Now in its third edition, this classic book is widely considered the leading text on Bayesian methods, lauded for its accessible, practical approach to analyzing data and solving research problems. Bayesian Data Analysis, Third Edition continues to take an applied approach to analysis using up-to-date Bayesian methods. The authors—all leaders in the statistics community—introduce basic concepts from a data-analytic perspective before presenting advanced methods. Throughout the text, numerous worked examples drawn from real applications and research emphasize the use of Bayesian inference in practice. New to the Third Edition Four new chapters on nonparametric modeling Coverage of weakly informative priors and boundary-avoiding priors Updated discussion of cross-validation and predictive information criteria Improved convergence monitoring and effective sample size calculations for iterative simulation Presentations of Hamiltonian Monte Carlo, variational Bayes, and expectation propagation New and revised software code The book can be used in three different ways. For undergraduate students, it introduces Bayesian inference starting from first principles. For graduate students, the text presents effective current approaches to Bayesian modeling and computation in statistics and related fields. For researchers, it provides an assortment of Bayesian methods in applied statistics. Additional materials, including data sets used in the examples, solutions to selected exercises, and software instructions, are available on the book's web page.

Asymptotic Theory of Statistical Inference Dec 14 2020 Probability and stochastic processes; Limit theorems for some statistics; Asymptotic theory of estimation; Linear parametric inference; Martingale approach to inference; Inference in nonlinear regression; Von mises functionals; Empirical characteristic function and its applications.

Inference and Consciousness Jun 27 2019 Inference has long been a central concern in epistemology, as an essential means by which we extend our knowledge and test our beliefs. Inference is also a key notion in influential psychological accounts of mental capacities, ranging from problem-solving to perception. Consciousness, on the other hand, has arguably been the defining interest of philosophy of mind over recent decades. Comparatively little attention, however, has been devoted to the significance of consciousness for the proper understanding of the nature and role of inference. It is commonly suggested that inference may be either conscious or unconscious. Yet how unified are these various supposed instances of inference? Does either enjoy explanatory priority in relation to the other? In what way, or ways, can an inference be conscious, or fail to be conscious, and how does this matter? This book brings together original essays from established scholars and emerging theorists that showcase how several current debates in epistemology, philosophy of psychology and philosophy of mind can benefit from more reflections on these and related questions about the significance of consciousness for inference.

Tools for Statistical Inference Jan 15 2021

Probabilistic Machine Learning Apr 05 2020 A detailed and up-to-date introduction to machine learning, presented through the unifying lens of probabilistic modeling and Bayesian decision theory. This book offers a detailed and up-to-date introduction to machine learning (including deep learning) through the unifying lens of probabilistic modeling and Bayesian decision theory. The book covers mathematical background (including linear algebra and optimization), basic supervised learning (including linear and logistic regression and deep neural networks), as well as more advanced topics (including transfer learning and unsupervised learning). End-of-chapter exercises allow students to apply what they have learned, and an appendix covers notation. Probabilistic Machine Learning grew out of the author's 2012 book, Machine Learning: A Probabilistic Perspective. More than just a simple update, this is a completely new book that reflects the dramatic developments in the field since 2012, most notably deep learning. In addition, the new book is accompanied by online Python code, using libraries such as scikit-learn, JAX, PyTorch, and Tensorflow, which can be used to reproduce nearly all the figures; this code can be run inside a web browser using cloud-based notebooks, and provides a practical complement to

the theoretical topics discussed in the book. This introductory text will be followed by a sequel that covers more advanced topics, taking the same probabilistic approach.

Introduction to Statistical Inference May 31 2022 Introduction to statistical inference; Specification of a statistical problem; Classifications of statistical problems; Some criteria for choosing a procedure; Linear unbiased estimation; Sufficiency; Point estimation; Hypothesis testing; Confidence intervals.

Signals, Systems and Inference, Global Edition Mar 05 2020 For upper-level undergraduate courses in deterministic and stochastic signals and system engineering An Integrative Approach to Signals, Systems and Inference Signals, Systems and Inference is a comprehensive text that builds on introductory courses in time- and frequency-domain analysis of signals and systems, and in probability. Directed primarily to upper-level undergraduates and beginning graduate students in engineering and applied science branches, this new textbook pioneers a novel course of study. Instead of the usual leap from broad introductory subjects to highly specialized advanced subjects, this engaging and inclusive text creates a study track for a transitional course. Properties and representations of deterministic signals and systems are reviewed and elaborated on, including group delay and the structure and behavior of state-space models. The text also introduces and interprets correlation functions and power spectral densities for describing and processing random signals. Application contexts include pulse amplitude modulation, observer-based feedback control, optimum linear filters for minimum mean-square-error estimation, and matched filtering for signal detection. Model-based approaches to inference are emphasized, in particular for state estimation, signal estimation, and signal detection. The text explores ideas, methods and tools common to numerous fields involving signals, systems and inference: signal processing, control, communication, time-series analysis, financial engineering, biomedicine, and many others. Signals, Systems and Inference is a long-awaited and flexible text that can be used for a rigorous course in a broad range of engineering and applied science curricula.

Statistical Inference Via Data Science Jul 21 2021 "Statistical Inference via Data Science: A ModernDive into R and the Tidyverse provides a pathway for learning about statistical inference using data science tools widely used in industry, academia, and government. It introduces the tidyverse suite of R packages, including the ggplot2 package for data visualization, and the dplyr package for data wrangling. After equipping readers with just enough of these data science tools to perform effective exploratory data analyses, the book covers traditional introductory statistics topics like confidence intervals, hypothesis testing, and multiple regression modeling, while focusing on visualization throughout"--

Statistical Inference Jun 19 2021 A concise, easily accessible introduction to descriptive and inferential techniques Statistical Inference: A Short Course offers a concise presentation of the essentials of basic statistics for readers seeking to acquire a working knowledge of statistical concepts, measures, and procedures. The author conducts tests on the assumption of randomness and normality, provides nonparametric methods when parametric approaches might not work. The book also explores how to determine a confidence interval for a population median while also providing coverage of ratio estimation, randomness, and causality. To ensure a thorough understanding of all key concepts, Statistical Inference provides numerous examples and solutions along with complete and precise answers to many fundamental questions, including: How do we determine that a given dataset is actually a random sample? With what level of precision and reliability can a population sample be estimated? How are probabilities determined and are they the same thing as odds? How can we predict the level of one variable from that of another? What is the strength of the relationship between two variables? The book is organized to present fundamental statistical concepts first, with later chapters exploring more advanced topics and additional statistical tests such as Distributional Hypotheses, Multinomial Chi-Square Statistics, and the Chi-Square Distribution. Each chapter includes appendices and exercises, allowing readers to test their comprehension of the presented material. Statistical Inference: A Short Course is an excellent book for courses on probability, mathematical statistics, and statistical inference at the upper-undergraduate and graduate levels. The book also serves as a valuable reference for researchers and practitioners who would like to develop further insights into

essential statistical tools.

Statistical Rethinking Jan 03 2020 Statistical Rethinking: A Bayesian Course with Examples in R and Stan builds readers' knowledge of and confidence in statistical modeling. Reflecting the need for even minor programming in today's model-based statistics, the book pushes readers to perform step-by-step calculations that are usually automated. This unique computational approach ensures that readers understand enough of the details to make reasonable choices and interpretations in their own modeling work. The text presents generalized linear multilevel models from a Bayesian perspective, relying on a simple logical interpretation of Bayesian probability and maximum entropy. It covers from the basics of regression to multilevel models. The author also discusses measurement error, missing data, and Gaussian process models for spatial and network autocorrelation. By using complete R code examples throughout, this book provides a practical foundation for performing statistical inference. Designed for both PhD students and seasoned professionals in the natural and social sciences, it prepares them for more advanced or specialized statistical modeling. Web Resource The book is accompanied by an R package (rethinking) that is available on the author's website and GitHub. The two core functions (map and map2stan) of this package allow a variety of statistical models to be constructed from standard model formulas.

All of Statistics Apr 29 2022 Taken literally, the title "All of Statistics" is an exaggeration. But in spirit, the title is apt, as the book does cover a much broader range of topics than a typical introductory book on mathematical statistics. This book is for people who want to learn probability and statistics quickly. It is suitable for graduate or advanced undergraduate students in computer science, mathematics, statistics, and related disciplines. The book includes modern topics like non-parametric curve estimation, bootstrapping, and classification, topics that are usually relegated to follow-up courses. The reader is presumed to know calculus and a little linear algebra. No previous knowledge of probability and statistics is required. Statistics, data mining, and machine learning are all concerned with collecting and analysing data.

Principles of Statistical Inference Sep 30 2019 In this definitive book, D. R. Cox gives a comprehensive and balanced appraisal of statistical inference. He develops the key concepts, describing and comparing the main ideas and controversies over foundational issues that have been keenly argued for more than two-hundred years. Continuing a sixty-year career of major contributions to statistical thought, no one is better placed to give this much-needed account of the field. An appendix gives a more personal assessment of the merits of different ideas. The content ranges from the traditional to the contemporary. While specific applications are not treated, the book is strongly motivated by applications across the sciences and associated technologies. The mathematics is kept as elementary as feasible, though previous knowledge of statistics is assumed. The book will be valued by every user or student of statistics who is serious about understanding the uncertainty inherent in conclusions from statistical analyses.

Computer Age Statistical Inference Jan 27 2022 Take an exhilarating journey through the modern revolution in statistics with two of the ringleaders.

Machine Learning Oct 31 2019 A comprehensive introduction to machine learning that uses probabilistic models and inference as a unifying approach. Today's Web-enabled deluge of electronic data calls for automated methods of data analysis. Machine learning provides these, developing methods that can automatically detect patterns in data and then use the uncovered patterns to predict future data. This textbook offers a comprehensive and self-contained introduction to the field of machine learning, based on a unified, probabilistic approach. The coverage combines breadth and depth, offering necessary background material on such topics as probability, optimization, and linear algebra as well as discussion of recent developments in the field, including conditional random fields, L1 regularization, and deep learning. The book is written in an informal, accessible style, complete with pseudo-code for the most important algorithms. All topics are copiously illustrated with color images and worked examples drawn from such application domains as biology, text processing, computer vision, and robotics. Rather than providing a cookbook of different heuristic methods, the book stresses

a principled model-based approach, often using the language of graphical models to specify models in a concise and intuitive way. Almost all the models described have been implemented in a MATLAB software package—PMTK (probabilistic modeling toolkit)—that is freely available online. The book is suitable for upper-level undergraduates with an introductory-level college math background and beginning graduate students.

Theoretical Statistics Sep 03 2022 Intended as the text for a sequence of advanced courses, this book covers major topics in theoretical statistics in a concise and rigorous fashion. The discussion assumes a background in advanced calculus, linear algebra, probability, and some analysis and topology. Measure theory is used, but the notation and basic results needed are presented in an initial chapter on probability, so prior knowledge of these topics is not essential. The presentation is designed to expose students to as many of the central ideas and topics in the discipline as possible, balancing various approaches to inference as well as exact, numerical, and large sample methods. Moving beyond more standard material, the book includes chapters introducing bootstrap methods, nonparametric regression, equivariant estimation, empirical Bayes, and sequential design and analysis. The book has a rich collection of exercises. Several of them illustrate how the theory developed in the book may be used in various applications. Solutions to many of the exercises are included in an appendix.

An Introduction to Causal Inference Aug 02 2022 This book summarizes recent advances in causal inference and underscores the paradigmatic shifts that must be undertaken in moving from traditional statistical analysis to causal analysis of multivariate data. Special emphasis is placed on the assumptions that underlie all causal inferences, the languages used in formulating those assumptions, the conditional nature of all causal and counterfactual claims, and the methods that have been developed for the assessment of such claims. These advances are illustrated using a general theory of causation based on the Structural Causal Model (SCM), which subsumes and unifies other approaches to causation, and provides a coherent mathematical foundation for the analysis of causes and counterfactuals. In particular, the paper surveys the development of mathematical tools for inferring (from a combination of data and assumptions) answers to three types of causal queries: those about (1) the effects of potential interventions, (2) probabilities of counterfactuals, and (3) direct and indirect effects (also known as "mediation"). Finally, the paper defines the formal and conceptual relationships between the structural and potential-outcome frameworks and presents tools for a symbiotic analysis that uses the strong features of both. The tools are demonstrated in the analyses of mediation, causes of effects, and probabilities of causation.

Statistical Inference Apr 17 2021 This book builds theoretical statistics from the first principles of probability theory. Starting from the basics of probability, the authors develop the theory of statistical inference using techniques, definitions, and concepts that are statistical and are natural extensions and consequences of previous concepts. Intended for first-year graduate students, this book can be used for students majoring in statistics who have a solid mathematics background. It can also be used in a way that stresses the more practical uses of statistical theory, being more concerned with understanding basic statistical concepts and deriving reasonable statistical procedures for a variety of situations, and less concerned with formal optimality investigations. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Probability and Statistical Inference Aug 29 2019 Priced very competitively compared with other textbooks at this level! This gracefully organized textbook reveals the rigorous theory of probability and statistical inference in the style of a tutorial, using worked examples, exercises, numerous figures and tables, and computer simulations to develop and illustrate concepts. Beginning wi

An Introduction to Bayesian Inference, Methods and Computation Nov 05 2022 These lecture notes provide a rapid, accessible introduction to Bayesian statistical methods. The course covers the fundamental philosophy and principles of Bayesian inference, including the reasoning behind the prior/likelihood model construction synonymous with Bayesian methods, through to advanced topics such as nonparametrics, Gaussian processes and latent factor models. These advanced modelling techniques can easily be applied using computer code samples written in Python and Stan which are

integrated into the main text. Importantly, the reader will learn methods for assessing model fit, and to choose between rival modelling approaches.

Mathematical Statistics Feb 13 2021 This graduate textbook covers topics in statistical theory essential for graduate students preparing for work on a Ph.D. degree in statistics. This new edition has been revised and updated and in this fourth printing, errors have been ironed out. The first chapter provides a quick overview of concepts and results in measure-theoretic probability theory that are useful in statistics. The second chapter introduces some fundamental concepts in statistical decision theory and inference. Subsequent chapters contain detailed studies on some important topics: unbiased estimation, parametric estimation, nonparametric estimation, hypothesis testing, and confidence sets. A large number of exercises in each chapter provide not only practice problems for students, but also many additional results.

Information Theory, Inference and Learning Algorithms May 07 2020 Table of contents

Instructor's Notes, Course 182, Military Justice, Naval Reserve Officers School Mar 29 2022

The Likelihood Principle Feb 25 2022

A First Course in Statistical Inference May 19 2021 This book offers a modern and accessible introduction to Statistical Inference, the science of inferring key information from data. Aimed at beginning undergraduate students in mathematics, it presents the concepts underpinning frequentist statistical theory. Written in a conversational and informal style, this concise text concentrates on ideas and concepts, with key theorems stated and proved. Detailed worked examples are included and each chapter ends with a set of exercises, with full solutions given at the back of the book. Examples using R are provided throughout the book, with a brief guide to the software included. Topics covered in the book include: sampling distributions, properties of estimators, confidence intervals, hypothesis testing, ANOVA, and fitting a straight line to paired data. Based on the author's extensive teaching experience, the material of the book has been honed by student feedback for over a decade. Assuming only some familiarity with elementary probability, this textbook has been devised for a one semester first course in statistics.

Introduction to Probability Nov 12 2020

Inference and Anticipation in Simultaneous Interpreting Dec 02 2019 Until now, Ghelly Chernov's work on the theory of simultaneous interpretation (SI) was mostly accessible only to a Russian-speaking readership. Finally, Chernov's major work, originally published in Russia in 1987 under the title (Introduction to Simultaneous Interpretation) and widely considered a in interpretation theory, is now available in English as well. Adopting a psycholinguistic approach to professional SI, Chernov defines it as a task performed in a single pass concurrently with the source language speech, under extreme perception and production conditions in which only a limited amount of information can be processed at any given time. Being both a researcher and a practitioner, Chernov drew from a rich interpreting corpus to create the first comprehensive model of simultaneous interpretation. His model draws on semantics, pragmatics, Russian Activity Theory and the SI communicative situation to formulate the principles of objective and subjective redundancy and identify probability prediction as the enabling mechanism of SI. Edited with notes and a critical foreword by two active SI researchers, Robin Setton and Adelina Hild, this book will be useful to practicing interpreters in providing a theoretical basis for appreciating the syntactic and other devices that can be used by both students and experienced interpreters in fine-tuning their performance in the booth.

Nonparametric and Semiparametric Models Aug 10 2020 The statistical and mathematical principles of smoothing with a focus on applicable techniques are presented in this book. It naturally splits into two parts: The first part is intended for undergraduate students majoring in mathematics, statistics, econometrics or biometrics whereas the second part is intended to be used by master and PhD students or researchers. The material is easy to accomplish since the e-book character of the text gives a maximum of flexibility in learning (and teaching) intensity.

Statistical Inference Via Convex Optimization Jul 01 2022 This authoritative book draws on the latest research to explore the interplay of high-dimensional statistics with optimization. Through an accessible

analysis of fundamental problems of hypothesis testing and signal recovery, Anatoli Juditsky and Arkadi Nemirovski show how convex optimization theory can be used to devise and analyze near-optimal statistical inferences. Statistical Inference via Convex Optimization is an essential resource for optimization specialists who are new to statistics and its applications, and for data scientists who want to improve their optimization methods. Juditsky and Nemirovski provide the first systematic treatment of the statistical techniques that have arisen from advances in the theory of optimization. They focus on four well-known statistical problems—sparse recovery, hypothesis testing, and recovery from indirect observations of both signals and functions of signals—demonstrating how they can be solved more efficiently as convex optimization problems. The emphasis throughout is on achieving the best possible statistical performance. The construction of inference routines and the quantification of their statistical performance are given by efficient computation rather than by analytical derivation typical of more conventional statistical approaches. In addition to being computation-friendly, the methods described in this book enable practitioners to handle numerous situations too difficult for closed analytical form analysis, such as composite hypothesis testing and signal recovery in inverse problems. Statistical Inference via Convex Optimization features exercises with solutions along with extensive appendixes, making it ideal for use as a graduate text.

Essential Statistical Inference Jul 29 2019 This book is for students and researchers who have had a first year graduate level mathematical statistics course. It covers classical likelihood, Bayesian, and permutation inference; an introduction to basic asymptotic distribution theory; and modern topics like M-estimation, the jackknife, and the bootstrap. R code is woven throughout the text, and there are a large number of examples and problems. An important goal has been to make the topics accessible to a wide audience, with little overt reliance on measure theory. A typical semester course consists of Chapters 1-6 (likelihood-based estimation and testing, Bayesian inference, basic asymptotic results) plus selections from M-estimation and related testing and resampling methodology. Dennis Boos and Len Stefanski are professors in the Department of Statistics at North Carolina State. Their research has been eclectic, often with a robustness angle, although Stefanski is also known for research concentrated on measurement error, including a co-authored book on non-linear measurement error models. In recent years the authors have jointly worked on variable selection methods.

Statistical Inference for Engineers and Data Scientists Oct 24 2021 A mathematically accessible textbook introducing all the tools needed to address modern inference problems in engineering and data science.

Introduction to the Theory of Statistical Inference Dec 26 2021 Based on the authors' lecture notes, Introduction to the Theory of Statistical Inference presents concise yet complete coverage of statistical inference theory, focusing on the fundamental classical principles. Suitable for a second-semester undergraduate course on statistical inference, the book offers proofs to support the mathematics. It illustrates core concepts using cartoons and provides solutions to all examples and problems. Highlights Basic notations and ideas of statistical inference are explained in a mathematically rigorous, but understandable, form Classroom-tested and designed for students of mathematical statistics Examples, applications of the general theory to special cases, exercises, and figures provide a deeper insight into the material Solutions provided for problems formulated at the end of each chapter Combines the theoretical basis of statistical inference with a useful applied toolbox that includes linear models Theoretical, difficult, or frequently misunderstood problems are marked The book is aimed at advanced undergraduate students, graduate students in mathematics and statistics, and theoretically-interested students from other disciplines. Results are presented as theorems and corollaries. All theorems are proven and important statements are formulated as guidelines in prose. With its multipronged and student-tested approach, this book is an excellent introduction to the theory of statistical inference.

Statistical Inference Nov 24 2021 This book offers a brief course in statistical inference that requires only a basic familiarity with probability and matrix and linear algebra. Ninety problems with solutions make it an ideal choice for self-study as well as a helpful review of a wide-ranging topic with important

uses to professionals in business, government, public administration, and other fields. 2011 edition.

Statistical Inference Mar 17 2021 A Balanced Treatment of Bayesian and Frequentist Inference Statistical Inference: An Integrated Approach, Second Edition presents an account of the Bayesian and frequentist approaches to statistical inference. Now with an additional author, this second edition places a more balanced emphasis on both perspectives than the first edition. New to the Second Edition New material on empirical Bayes and penalized likelihoods and their impact on regression models Expanded material on hypothesis testing, method of moments, bias correction, and hierarchical models More examples and exercises More comparison between the approaches, including their similarities and differences Designed for advanced undergraduate and graduate courses, the text thoroughly covers statistical inference without delving too deep into technical details. It compares the Bayesian and frequentist schools of thought and explores procedures that lie on the border between the two. Many examples illustrate the methods and models, and exercises are included at the end of each chapter.

Ecological Statistics Jun 07 2020 An intermediate level text covering foundational ideas in statistics and their ecological application, including generalized linear and generalized mixed-effect models, as well as models allowing for mixtures, spatial or phylogenetic correlations, missing or censored data, and observational data; implemented in R and set within a contemporary research framework.

Maximum Likelihood Estimation and Inference Aug 22 2021 This book takes a fresh look at the popular and well-established method of maximum likelihood for statistical estimation and inference. It begins with an intuitive introduction to the concepts and background of likelihood, and moves through to the latest developments in maximum likelihood methodology, including general latent variable models and new material for the practical implementation of integrated likelihood using the free ADMB software. Fundamental issues of statistical inference are also examined, with a presentation of some of the philosophical debates underlying the choice of statistical paradigm. Key features: Provides an accessible introduction to pragmatic maximum likelihood modelling. Covers more advanced topics, including general forms of latent variable models (including non-linear and non-normal mixed-effects and state-space models) and the use of maximum likelihood variants, such as estimating equations, conditional likelihood, restricted likelihood and integrated likelihood. Adopts a practical approach, with a focus on providing the relevant tools required by researchers and practitioners who collect and analyze real data. Presents numerous examples and case studies across a wide range of applications including medicine, biology and ecology. Features applications from a range of disciplines, with implementation in R, SAS and/or ADMB. Provides all program code and software extensions on a supporting website. Confines supporting theory to the final chapters to maintain a readable and pragmatic focus of the preceding chapters. This book is not just an accessible and practical text about maximum likelihood, it is a comprehensive guide to modern maximum likelihood estimation and inference. It will be of interest to readers of all levels, from novice to expert. It will be of great benefit to researchers, and to students of statistics from senior undergraduate to graduate level. For use as a course text, exercises are provided at the end of each chapter.

Fundamentals of Causal Inference Sep 10 2020 One of the primary motivations for clinical trials and observational studies of humans is to infer cause and effect. Disentangling causation from confounding is of utmost importance. Fundamentals of Causal Inference explains and relates different methods of confounding adjustment in terms of potential outcomes and graphical models, including standardization, difference-in-differences estimation, the front-door method, instrumental variables estimation, and propensity score methods. It also covers effect-measure modification, precision variables, mediation analyses, and time-dependent confounding. Several real data examples, simulation studies, and analyses using R motivate the methods throughout. The book assumes familiarity with basic statistics and probability, regression, and R and is suitable for seniors or graduate students in statistics, biostatistics, and data science as well as PhD students in a wide variety of other disciplines, including epidemiology, pharmacy, the health sciences, education, and the social, economic, and behavioral sciences. Beginning with a brief history and a review of essential elements of probability and statistics, a unique feature of the book is its focus on real and simulated datasets with all binary variables to

reduce complex methods down to their fundamentals. Calculus is not required, but a willingness to tackle mathematical notation, difficult concepts, and intricate logical arguments is essential. While many real data examples are included, the book also features the Double What-If Study, based on simulated data with known causal mechanisms, in the belief that the methods are best understood in circumstances where they are known to either succeed or fail. Datasets, R code, and solutions to odd-numbered exercises are available at www.routledge.com.

Statistical Inference from Genetic Data on Pedigrees Feb 02 2020 Annotation While this monograph is not about show dogs or cats, its statistical methods could be applied to tracing the pedigree of these species as well as humans. Thompson (U. of Washington) covers such topics as genetic models, population allele frequencies, kinship/inbreeding coefficients, and Monte Carlo estimation. Includes supporting tables and figures. Suitable as a supplementary text or primary text for advanced students. Lacks an index. c. Book News Inc.

Causal Inference in Statistics, Social, and Biomedical Sciences Oct 04 2022 This text presents statistical methods for studying causal effects and discusses how readers can assess such effects in simple randomized experiments.