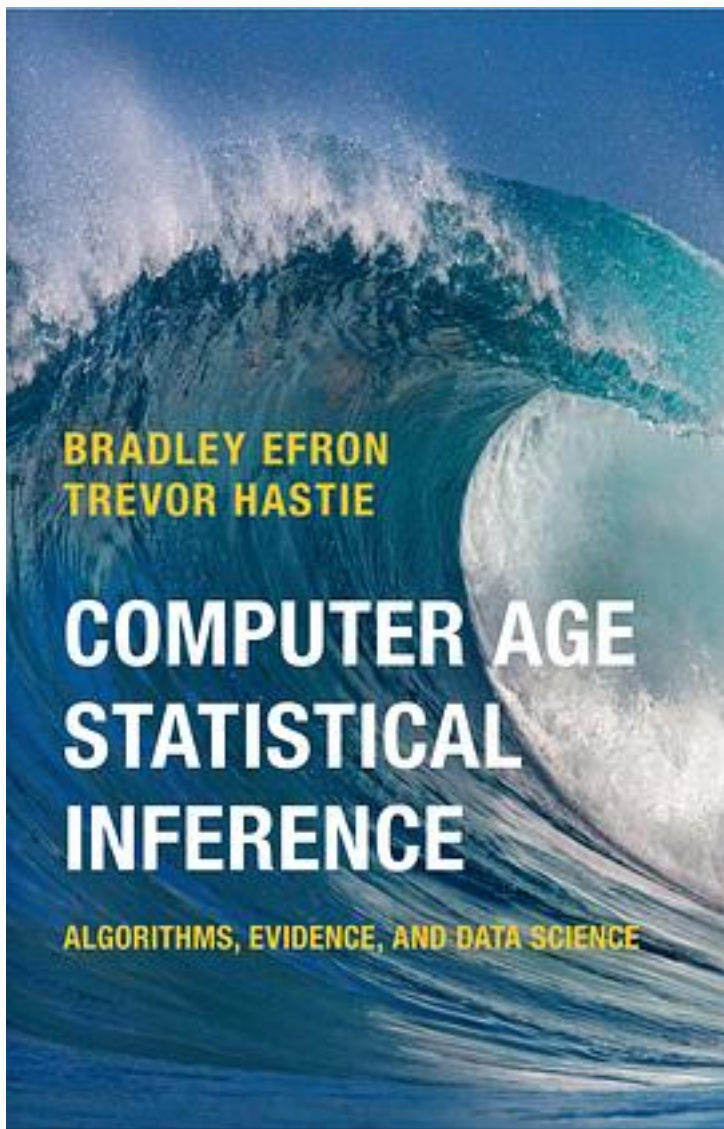


# Computer Age Statistical Inference



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The twenty-first century has seen a breathtaking expansion of statistical methodology, both in scope and in influence. 'Big data', 'data science', and 'machine learning' have become familiar terms in the news, as statistical methods are brought to bear upon the enormous data sets of modern science and commerce. How did we get here? And where are we going? This book takes us on an exhilarating journey through the revolution in data analysis following the introduction of electronic computation in the 1950s. Beginning with classical inferential theories - Bayesian, frequentist, Fisherian - individual chapters take up a series of influential topics: survival analysis, logistic regression, empirical Bayes, the jackknife and bootstrap, random forests, neural networks, Markov chain Monte Carlo, inference after model selection, and dozens more. The distinctly modern approach integrates methodology and algorithms with statistical inference. The book ends with speculation on the future direction of statistics and data science.

Clarifies both traditional methods and current, popular algorithms (e.g. neural nets, random forests)

Written by two world-leading researchers

Addressed to all fields that work with data

作者介绍:

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Bradley Efron is Max H. Stein Professor, Professor of Statistics, and Professor of Biomedical Data Science at Stanford University, California. He has held visiting faculty appointments at Harvard University, Massachusetts, the University of California, Berkeley, and Imperial College of Science, Technology and Medicine, London. Efron has worked extensively on theories of statistical inference, and is the inventor of the bootstrap sampling technique. He received the National Medal of Science in 2005 and the Guy Medal in Gold of the Royal Statistical Society in 2014.

Trevor Hastie, Stanford University, California

Trevor Hastie is John A. Overdeck Professor, Professor of Statistics, and Professor of Biomedical Data Science at Stanford University, California. He is coauthor of Elements of Statistical Learning, a key text in the field of modern data analysis. He is also known for his work on generalized additive models and principal curves, and for his contributions to the R computing environment. Hastie was awarded the Emmanuel and Carol Parzen prize for Statistical Innovation in 2014.

目录: Part I. Classic Statistical Inference:

1. Algorithms and inference
2. Frequentist inference
3. Bayesian inference
4. Fisherian inference and maximum likelihood Estimation
5. Parametric models and exponential families

Part II. Early Computer-Age Methods:

6. Empirical Bayes

7. James–Stein estimation and ridge regression
  8. Generalized linear models and regression trees
  9. Survival analysis and the EM algorithm
  10. The jackknife and the bootstrap
  11. Bootstrap confidence intervals
  12. Cross-validation and Cp estimates of prediction error
  13. Objective Bayes inference and Markov chain Monte Carlo
  14. Statistical inference and methodology in the postwar era
- Part III. Twenty-First Century Topics:
15. Large-scale hypothesis testing and false discovery rates
  16. Sparse modeling and the lasso
  17. Random forests and boosting
  18. Neural networks and deep learning
  19. Support-vector machines and Kernel methods
  20. Inference after model selection
  21. Empirical Bayes estimation strategies
- Epilogue
- • • • • [\(收起\)](#)

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## 标签

统计学

统计

数据科学

计算机

statistics

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統計學

## 评论

比较吸引我的是对于Fisher和Bayes学派的想法，尤其是以前看到的所有的书都把Fisher当成频率学派的代言人，这里的观点感觉更客观些。其他的都讲得比较泛泛了

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后半本偏向于机器学习。全书并不会逐步推导公式，而是从想法和直觉去讨论统计方法。章节安排一定程度上根据统计方法出现的时间先后排列。讲述方法的时候进行了横向纵向的比较，高屋建瓴。作者是bootstrap的发明者之一，采访中说自己垂垂老矣，决定不写论文，写一本书来说明computer age的统计方法。对统计学感兴趣的读者不可错过。本人闲暇时还复现了书中一些图表，借助书中的公式和数据集进行实战，加深了自己对统计方法的理解。

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世上有一些书读起来很痛苦，但却得给好评，掉了一星只是因为此书属于“无需证明，显然可得”的高级数学书，非习惯抽象概念公式化且可以自行推导的人不能深入。纵览数据统计科学理论和方法发展的百年风云，也许这本书不是最好，但应该是最全面的之一，即便越往后感觉愈发简练，当然每一章本来就能单独拿出来写好几本书，所以将近500页的此书必定有体量限制。非统计相关方向的心理学人大概对整个统计方法领域的发展本身兴趣不大，但书中例子涉及的方法足使人了解在传统模式的桎梏之外还存在着更多可能性，此外各种方法在数学证明层面的相互比较也是非理论统计专业课程难见的。由于心理学研究至今绝大部分仍是非大数据驱动，经典方法占主流，虽然不知道测量评估距离量大质优的终极目标还需多久，但若想吃到现在计算力爆发的红利还是需要相符的高级工具。

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这本书讲得很好，但需要读者至少有较好的本科数理统计基础，否则你会觉得他们很多东西没讲透，就像amazon.com里一些评论所说。

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对这个统计领域的一个high level综述，学过统计理论or机器学习基本上可以读懂大部分。讲得比较泛，了解一些主要思想还不错，具体细节还是要看专门的书。

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很好，等把每一章的专题学下用下，再来读第2遍，2017第1本

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斯坦福Efron 教授的好书，以statistical inference 历史发展的顺序娓娓道来。高屋建瓴，易于理解。

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书评

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