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<<概率论沉思录>>

图书基本信息

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前言

The following material is addressed to readers who are already familiar with applied math- ematics, at the advanced undergraduate level or preferably higher, and with some field, such as physics, chemistry, biology, geology, medicine, economics, sociology, engineering, operations research, etc., where inference is needed.1 A previous acquaintance with proba- bility and statistics is not necessary; indeed, a certain amount of innocence in this area may be desirable, because there will be less to unlearn.We are concerned with probability theory and all of its conventional mathematics, but now viewed in a wider context than that of the standard textbooks. Every chapter after the first has 'new' （i.e. not previously published） results that we think will be found interesting and useful. Many of our applications lie outside the scope of conventional probability theory as currently taught. But we think that the results will speak for themselves, and that something like the theory expounded here will become the conventional probability theory of the future.

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内容概要

本书将概率和统计推断融合在一起，用新的观点生动地描述了概率论在物理学、数学、经济学、化学和生物学等领域中的广泛应用，尤其是它阐述了贝叶斯理论的丰富应用，弥补了其他概率和统计教材的不足。
全书分为两大部分。
第一部分包括10章内容，讲解抽样理论、假设检验、参数估计等概率论的原理及其初等应用；第二部分包括12章内容，讲解概率论的高级应用，如在物理测量、通信理论中的应用。
本书还附有大量习题，内容全面，体例完整。
　　本书内容不局限于某一特定领域，适合涉及数据分析的各领域工作者阅读，也可作为高年级本科生和研究生相关课程的教材。

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作者简介

E.T.Jaynes（1922—1998）已故著名数学家和物理学家。
生前曾任华盛顿大学圣路易斯分校和斯坦福大学教授。
他因为提出了热动力学的最大熵原理（1957年）和量子光学的Jaynes-Cummings／模型（1963年）而闻名于世。
此后的几十年，他一直在探求将概率和统计推断作为整个科学的逻辑基础这一重大课题，其成果和心得最终凝结为本书。

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章节摘录

插图：This kind of conceptualizing often leads one to suppose that these distributions represent not just our prior state of knowledge about the data, but the actual long-run variability of the data in such experiments. Clearly, such a belief cannot be justified; anyone who claims to know in advance the long-run results in an experiment that has not been performed is drawing on a vivid imagination, not on any fund of actual knowledge of the phenomenon. Indeed, if that infinite population is only imagined, then it seems that we are free to imagine any population we please.From a mere act of the imagination we cannot learn anything about the real world. To suppose that the resulting probability assignments have any real physical meaning is just another form of the mind projection fallacy. In practice, this diverts our attention to irrelevancies and away from the things that really matter （such as information about the real world that is not expressible in terms of any sampling distribution, or does not fit into the urn picture, but which is nevertheless highly cogent for the inferences we want to make）. Usually, the price paid for this folly is missed opportunities; had we recognized that information, more accurate and/or more reliable inferences could have been made. Urn-type conceptualizing is capable of dealing with only the most primitive kind of information, and really sophisticated applications require us to develop principles that go far beyond the idea of urns. But the situation is quite subtle, because, as we stressed before in connection with Godel's theorem, an erroneous argument does not necessarily lead to a wrong conclusion. In fact, as we shall find in Chapter 9, highly sophisticated calculations sometimes lead us back to urn-type distributions, for purely mathematical reasons that have nothing to do conceptually with urns or populations. The hypergeometric and binomial distributions found in this chapter will continue to reappear, because they have a fundamental mathematical status quite independent of arguments that we used to find them here.

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“这是几十年来最重要的一部概率论著作。
它解决了许多长期困扰我的问题。
概率、统计、模式识别、数据分析、机器学习、数据挖掘……只要你的工作涉及不完全和不确定信息的处理，就应该仔细研读本书。
它将大大改变你思考问题的方式。
” ——KevIn S. Van Horn，资深计算机技术和概率统诗专家“本书广受欢迎。
读者会在书中发现很多引人深思的内容，不仅涉及日常实践，更深人统骨和概率理论本身。
无论对于统计学者还是各应用领域的科技工作者，本书都是必读之作。
” ——美国《数学评论》“这不是一本普通的教材。
它全面、彻底地阐述了统计中的贝叶斯方法。
书中有上百个例子，足够让你透彻理解其中的理论和应用。
每个对统计问题或统计应用感兴趣的人都应该仔细研读。
” ——sIAM News

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《概率论沉思录(英文版)》不仅适合概率和统计专业人士阅读。
也是需要应用统计推断的各领域科技工作者的必读之作。
《概率论沉思录(英文版)》是一部奇书。
它是著名数学物理学家Jaynes的遗作，凝聚了他对概率论长达40年的深刻思考。
原版出版后产生了巨大影响，深受众多专家和学者的好评，并获得Amazon网上书店读者全五星评价。
在书中，作者在H.Jeffreys、R.T.Cox、C.E.Shannon和G.Polya等数学大师思想的基础上继续探索，将概率论置于更大的背景下考察，提出将概率推断作为整个科学的逻辑基础，以适应实际科学研究中对象往往都是信息不完全或者不确定的这一难题，从而超越了传统的概率论，也超越了传统的数理逻辑思维定式。

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