Sundberg

Statistical Modelling by Exponential Families

This book is a readable, digestible introduction to exponential families, encompassing statistical models based on the most useful distributions in statistical theory, including the normal, gamma, binomial, Poisson, and negative binomial. Strongly motivated by applications, it presents the essential theory and then demonstrates the theory's practical potential by connecting it with developments in areas like item response analysis, social network models, conditional independence and latent variable structures, and point process models. Extensions to incomplete data models and generalized linear models are also included. In addition, the author gives a concise account of the philosophy of Per Martin-Löf in order to connect statistical modelling with ideas in statistical physics, including Boltzmann's law. Written for graduate students and researchers with a background in basic statistical inference, the book includes a vast set of examples demonstrating models for applications and exercises embedded within the text as well as at the ends of chapters.

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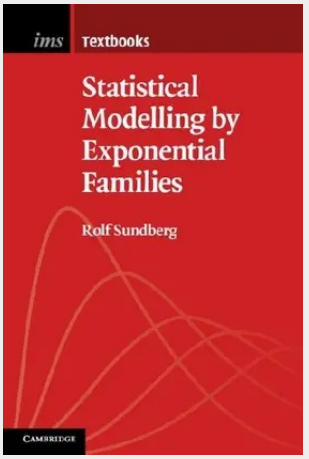

52,10 €
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Lieferfrist: bis zu 10 Tage

Artikelnummer: 9781108701112
Medium: Buch
ISBN: 978-1-108-70111-2
Verlag: Cambridge University Press
Erscheinungstermin: 29.08.2019
Sprache(n): Englisch
Auflage: Erscheinungsjahr 2019
Serie: Institute of Mathematical Statistics Textbooks
Produktform: Kartoniert
Gewicht: 435 g
Seiten: 290
Format (B x H): 152 x 229 mm