Werk

Titel: Parameter estimation and hypothesis testing in spectral analysis of stationary ti...

Autor: Rosenblatt, M.

Jahr: 1987

PURL: https://resolver.sub.uni-goettingen.de/purl?358794056_0034|log55

Kontakt/Contact

Digizeitschriften e.V.
SUB Göttingen
Platz der Göttinger Sieben 1
37073 Göttingen

info@digizeitschriften.de

The two remaining chapters explore more specialized topics. Chapter 6 describes non-iterative methods of construction of designs in certain special cases. Included are first-order regression models, weighing designs, polynomials on the real line and designs for interpolation and extrapolation. Many of the results depend on the properties of orthogonal polynomials. The final, seventh, chapter is concerned with designs for physical fields and infinite-dimensional parameters, a particular research interest of the author.

Those who have pursued this review thus far will probably have a professional interest in the field of optimum design and will have a favourite book, either in English or German. I hope it is clear from what I have said that Pazman's book forms a valuable and distinctive addition to this not very large literature.

The book, printed in Czechoslovakia, is very nicely produced. The translation is by the author, a bold undertaking on his part and, almost always, a successful one. But I cannot help wondering why the publishers did not have the manuscript read through by a native English speaker for, just occasionally, the author's command of the language deserts him. Thus we read on p. 82 that "an A-optimum design supresses the variances of the (parameter) estimates". Although the intention is clear, it is the case that supression has a rather different, and usually more sinister, meaning.

London *A. C. Atkinson*

Dzhaparidze K: *Parameter estimation and hypothesis testing in spectral analysis of stationary time series.* Springer Series in Statistics, Springer-Verlag 1985, 324 p, DM 148,–.

This book deals with a fairly narrowly defined set of topics in time series analysis. As remarked, in the book its appearance is due in part to a renewed and reinforced interest in finite parameter models in time series analysis and finite parameter estimation. Much of the work on finite parameter estimation was given a great impetus in the 1950's by the deep heuristic insights of Peter Whittle [3] and whether explicitly or implicitly has focused about the character of results that he proposed. The second of the five chapters of this book is titled "Estimation of parameters by means of P. Whittle's method" and is evidence of this continued impact. This approach is based on a maximum likelihood procedure as one might use it in the case of a Gaussian stationary process. For this reason the first chapter is concerned with the properties of a maximum likelihood function for a Gaussian time series. The focus in the book is on stationary processes with mean zero. For this reason there is no discussion of the estimation of discrete harmonics, an area in which Whittle again contributed interesting asymptotic insights.

On of the broadest contexts discussed for estimation of an unknown parameter value is that in which (i) the unknown parameter value belongs to a closed subset of an open subset of p-dimensional Euclidean space (ii) if θ_1 and θ_2 are two possible values of the parameter the corresponding spectral densities $f_{\theta_1}(\lambda)$, $f_{\theta_2}(\lambda)$ differ for almost all λ (iii) the process X_t observed for $t = 1, \ldots, n$ is strongly mixing. Let

$$V_n(\theta) = V_n(\theta; X) = 1/4\pi \int_{-\pi}^{\pi} [\log f_\theta(\lambda) + I_n(\lambda)/f_\theta(\lambda)]d\lambda$$

with $I_n(\lambda) = I_n(\lambda; X)$ the periodogram of $X = (X_t\, t = 1, \ldots, n)$. The estimator $\tilde{\theta}$ is determined