

An Introduction to Continuity, Extrema, and Related Topics for General Gaussian Processes

by Robert J. Adler

This monograph provides a general and abstract introduction to the theory of sample path properties of Gaussian processes based on concepts such as entropy and majorising measures. A generally accessible introduction to majorising measures, the general theory of continuity, boundedness, and suprema distributions for Gaussian processes is presented.

Contents

Introduction

The basic ideas; The Brownian family of processes; A collection of examples; Exercises

Two Basic Results

Borell's inequality; Slepian's inequality; Applications in Banach spaces; Exercises

Prelude to Continuity

Boundedness and continuity; Zero-one laws and continuity; The Karhunen-Loeve expansion; Exercises

Boundedness and Continuity

Majorising measures; Upper bound proof; Lower bound proof; Entropy; Ultrametricity and majorising measures; Discontinuous processes; Exercises

Suprema Distributions

Introduction; Some easy bounds; Processes with a unique point of maximal variance; General bounds; The Brownian sheet on the unit square; Exercises

Afterthoughts

Two topics that were left out; Directions for research

References

Index

List price \$25
IMS member price \$15

**Order prepaid from:
Institute of Mathematical Statistics
3401 Investment Boulevard, Suite 7
Hayward, California 94545 (USA)**

The Annals of Statistics

Vol. 19

June 1991

No. 2

Articles

- Slicing regression: A link-free regression method NAIHUA DUAN AND KER-CHAU LI
Rank regression methods for left-truncated and right-censored data
TZE LEUNG LAI AND ZHILIANG YING
- Asymptotics of maximum likelihood estimators for the Curie-Weiss model
FRANCIS COMETS AND BASILIS GIDAS
- Minimum Hellinger distance estimation of parameter in the random
censorship model SONG YANG
- On maximum likelihood estimation in infinite dimensional parameter spaces
WING HUNG WONG AND THOMAS A. SEVERINI
- Geometrizing rates of convergence, II DAVID L. DONOHO AND RICHARD C. LIU
- Geometrizing rates of convergence, III DAVID L. DONOHO AND RICHARD C. LIU
- Rates of convergence for the estimates of the optimal transformations
of variables PRABIR BURMAN
- Estimating a smooth monotone regression function ENNO MAMMEN
- Nonparametric regression under qualitative smoothness assumptions . . . ENNO MAMMEN
- Nonparametric estimates of regression quantiles and their local
Bahadur representation PROBAL CHAUDHURI
- Bootstrap simultaneous error bars for nonparametric regression
W. HÄRDLE AND J. S. MARRON
- Large sample theory of estimation in biased sampling regression models. I
PETER J. BICKEL AND J. RITOV
- A comparison of a spline estimate to its equivalent kernel estimate K. MESSER
- Fully coherent inference H. D. BRÜNK
- Maximum likelihood estimation of a set of covariance matrices under Löwner
order restrictions with applications to balanced multivariate variance
components models JAMES A. CALVIN AND RICHARD L. DYKSTRA
- Statistical inference for uniform stochastic ordering in several populations
RICHARD DYKSTRA, SUBHASH KOCHAR AND TIM ROBERTSON
- Anomalies of the likelihood ratio test for testing restricted hypotheses
J. A. MENÉNDEZ AND B. SALVADOR
- Testing for spherical symmetry of a multivariate distribution LUDWIG BARINGHAUS
- Sensitive and sturdy p -values JOHN I. MARDEN
- Minimaxity of the empirical distribution function in invariant estimation
QIQING YU AND MO-SUK CHOW
- Shrinkage domination in a multivariate common mean problem EDWARD I. GEORGE
- Asymptotic theory of sequential estimation: Differential geometrical approach
ICHI OKAMOTO, SHUN-ICHI AMARI AND KEI TAKEUCHI
- Asymptotically optimal hypothesis testing with memory constraints
J. A. BUCKLEW AND P. E. NEY
- The power and optimal kernel of the Bickel-Rosenblatt test for goodness of fit
B. K. GHOSH AND WEI-MIN HUANG
- Block designs and electrical networks TUE TJUR
- Some results on s^{n-k} fractional factorial designs with minimum aberration
or optimal moments JIAHUA CHEN AND C. F. J. WU
- Second order analysis of two-stage rank tests for the one-sample problem
WILLEM ALBERS
- Empirical likelihood is Bartlett-correctable
THOMAS DiCICCIO, PETER HALL AND JOSEPH ROMANO
- Bahadur representations for uniform resampling and importance resampling,
with applications to asymptotic relative efficiency PETER HALL
- The diffuse Kalman filter PIET DE JONG

Short Communications

- Prediction in the worst case DEAN P. FOSTER
- Some poset statistics PAUL R. ROSENBAUM
- Bootstrapping unstable first-order autoregressive processes
I. V. BASAWA, A. K. MALLIK, W. P. MCCORMICK, J. H. REEVES AND R. L. TAYLOR
- Note on the tail behavior of general weighted empirical processes
MARTIEN C. A. VAN ZUIJLEN
- A note on Blackwell and Hodges (1957) and Diaconis and Graham (1981)
MICHAEL PROSCHAN

The Annals of Probability

Vol. 19

July 1991

No. 3

Special Invited Paper

Markov chains with stochastically stationary transition probabilities STEVEN OREY

Articles

W. Doeblin, 1915–1940 TORGNY LINDVALL

L_2 rates of convergence for attractive reversible nearest particle systems:

The critical case THOMAS M. LIGGETT

The contact process in a random environment

MAURY BRAMSON, RICK DURRETT AND ROBERTO H. SCHONMANN

Exponential decay for subcritical contact and percolation processes

CAROL BEZUIDENHOUT AND GEOFFREY GRIMMETT

Random time changes and convergence in distribution

under the Meyer–Zheng conditions THOMAS G. KURTZ

Weak limit theorems for stochastic integrals and stochastic

differential equations THOMAS G. KURTZ AND PHILIP PROTTER

Diffusion approximation for a class of transport processes

with physical reflection boundary conditions C. COSTANTINI

Weak convergence to a Markov chain with an entrance boundary:

Ancestral processes in population genetics PETER DONNELLY

Boundary value problems for stochastic differential equations

D. NUALART AND E. PARDOUX

Multiple stochastic integrals with respect to symmetric infinitely

divisible random measures JERZY SZULGA

Branching particle systems and superprocesses E. B. DYNKIN

Product martingales and stopping lines for branching Brownian motion

BRIGITTE CHAUVIN

Majorization, exponential inequalities and almost sure behavior

of vector-valued random variables ERICH BERGER

On the almost sure behavior of sums of iid random variables

in Hilbert space UWE EINMAHL

Gaussian measure of large balls in l_p WERNER LINDE

Large deviations for Markov processes with discontinuous statistics, I:

General upper bounds PAUL DUPUIS, RICHARD S. ELLIS AND ALAN WEISS

The ruin problem for finite Markov chains THOMAS HÖGLUND

Approximate independence of distributions on spheres

and their stability properties S. T. RACHEV AND L. RÜSCHENDORF

Minimax grid matching and empirical measures P. W. SHOR AND J. E. YUKICH

Variance functions with meromorphic means

SHAUL K. BAR-LEV, DAUD BSHOUTY AND PETER ENIS

Generating a random linear extension of a partial order PETER MATTHEWS

Correction

A functional central limit theorem for random mappings JENNIE C. HANSEN

Acknowledgment of Priority

On the integral of the absolute value of the pinned Wiener process L. SHEPP

The Institute of Mathematical Statistics
announces publication of the

**CUMULATIVE INDEX TO
IMS SCIENTIFIC JOURNALS
1960–1989**

- Indexes the following journals:

The Annals of Mathematical Statistics (Vols. 31-43, 1960-1972)

The Annals of Statistics (Vols. 1-17, 1973-1989)

The Annals of Probability (Vols. 1-17, 1973-1989)

Statistical Science (Vols. 1-4, 1986-1989)

Selected articles from *The IMS Bulletin* (Vols. 16-18, 1987-1989)

- Follows the same format as the *Current Index to Statistics*, including author and subject indexes:

Author index lists each author of each article. Lists are chronological for each author.

Subject index lists each article according to important words in its title and key words not appearing in the title.

Published by the Institute of Mathematical Statistics. Publication of the *Cumulative Index to IMS Scientific Journals* is expected in early 1991.

List price \$50
IMS member price \$15

Orders are now being accepted at the above prices, with shipping upon availability.
Order prepaid from:

**Institute of Mathematical Statistics
3401 Investment Boulevard, Suite 7
Hayward, California 94545 (USA)**