COLLOQUIA MATHEMATICA
SOCIETATIS JÁNOS BOLYAI, 32.

NONPARAMETRIC STATISTICAL INFERENCE

Edited by:

B.V. GNEDENKO
M.L. PURI
and
I. VINCZE

Vol. I.

NORTH-HOLLAND

8560460

COLLOQUIA MATHEMATICA
SOCIETATIS JÁNOS BOLYAI, 32.

NONPARAMETRIC STATISTICAL INFERENCE

Edited by:

B.V. GNEDENKO
M.L. PURI
and
I. VINCZE

Vol. I.

E8560460

NORTH-HOLLAND PUBLISHING COMPANY
AMSTERDAM — OXFORD — NEW YORK

© BOLYAI JÁNOS MATEMATIKAI TÁRSULAT

Budapest, Hungary, 1982

ISBN North-Holland: 0 444 86196 3
ISSN Bolyai: 0139 3383
ISBN Bolyai: 963 8021 53 5 Vol. I-II
ISBN Bolyai: 963 8021 54 3 Vol. I

Joint edition published by

JÁNOS BOLYAI MATHEMATICAL SOCIETY
and
NORTH-HOLLAND PUBLISHING COMPANY
Amsterdam – Oxford – New York

In the U.S.A. and Canada
NORTH-HOLLAND PUBLISHING COMPANY
52 Vanderbilt Avenue
New York, N.Y. 10017

Printed in Hungary
Szegedi Nyomda
Szeged

8560460

PREFACE

The field of nonparametric statistics continues to play an increasingly succesful role in statistical theory as well as in its applications. Nonparametric methods are not only mathematically elegant, they also provide a variety of applications in several fields such as engineering, economics, agriculture, meteorology and biometrics among others. To stimulate further research and provide an opportunity for personal contacts among scholars whose fields of specialization cover broad spectra, a colloquium on nonparametric statistical inference was held in Budapest from June 23-27, 1980. It was organized by the János Bolyai Mathematical Society and was sponsored by the Bernoulli Society for Mathematical Statistics and Probability and by the Hungarian Central Statistical Office. Professors D.R. Cox and I. Vincze were kind enough to make the opening remarks on behalf of the Bernoulli Society and the Bolyai Society respectively.

The program committee of the colloquium consisted of Professors D.R. Cox, B.V. Gnedenko, J. Jurečková, P. Révész, K. Sarkadi, I. Vincze (Chairman), W.R. Van Zwet and myself. The national organizing committee consisted of Professors M. Arató, P. Bártfai, E. Csáki, B. Gyires, A. Marton and G. Tusnády with A. Krámli, T. Móri and L. Rejtő as secretaries. It is a pleasure to express our sincere thanks to the members of both these committees for the overall help they gave in making the colloquium a great success. Evidence of the results of their efforts was the rich and active participation of about 150 scholars from 19 different countries. The members of the national organizing committee are also to be thanked for taking care of problems connected with local arrangements. Our Hungarian hosts deserve our thanks not only for the superb organization of the conference but also for providing an excellent atmosphere of warmth, friendliness and generous hospitality.

The proceedings of the colloquium are divided into two volumes containing a broad range of topics such as testing and estimation, ranking and selection, empirical distributions and stochastic processes among

others. The papers in the volumes were presented at the colloquium and were reviewed by the referees. It is a pleasure to express our appreciation to them as well as the authors for their help and cooperation.

Special thanks are due to the Hungarian Central Statistical Office and to its President Mrs. Vera Nyitrai for their help as well as encouragement in organizing the colloquium.

We hope that the proceedings of the colloquium will be of interest to mathematicians as well as applied statisticians.

Madan L. Puri

试读结束：需要全本请在线购买： www.ertongbook.com

CONTENTS
Volume I

PREFACE 3
CONTENTS 5
SCIENTIFIC PROGRAM 9
LIST OF PARTICIPANTS 20
R. Ahmad, On tests of independence for the multiway Markovian contingency tables 29
K.B. Athreya – P. Ney, Some aspects of ergodic theory of laws of large numbers for Harris-recurrent Markov chains 41
J. Blum – V. Susarla – G. Walter, Estimation of the prior distribution using differential operators 57
I.S. Borisov, An approximation of empirical fields 77
M.D. Burke, Tests for exponentiality based on randomly censored data 89
G. Campbell -- A. Földes, Large-sample properties of nonparametric bivariate estimators with censored data 103
E. Csáki, On the standardized empirical distribution function 123
S. Csörgő, The empirical moment generating function 139
M. Csörgő – P. Révész, An invariance principle for N.N. empirical density functions 151
D. Dabrowska, Parametric and nonparametric models with special schemes of stochastic dependence 171
P. Deheuvels, Some applications of the dependence functions to statistical inference: nonparametric estimates of extreme values distributions, and a Kiefer type universal bound for the uniform test of independence 183
R.J.M.M. Does – R. Helmers, Edgeworth expansions for functions of uniform spacings 203
C. Domański, Notes on the Theil test for the hypothesis of linearity for the model with two explanatory variables 213
J. Galambos, A statistical test for extreme value distributions 221

S. Geman An application of the method of sieves: functional estimator for the drift of a diffusion 231
J. Ghorai – L. Rejtő – V. Susarla, LIL type properties on the whole line) of the PL and the Bayes estimators 253
J. Ghorai – A. Susarla – V. Susarla – J. Van Ryzin, Nonparametric estimation of mean residual life time with censored data 269
M. Ghosh – R. Dasgupta, Berry – Esseen theorems for U-statistics in the non i.i.d. case 293
Z. Govindarajulu, Asymptotic normality of linear combinations of functions of order statistics in one and several samples 315
H. Grimm, Transformation of variables versus nonparametrics 351
S.S. Gupta – G.C. McDonald, Nonparametric procedures in multiple decisions (ranking and selection procedures) 361
B. Gyires, Linear rank statistics generated by uniformly distributed sequences 391
S.A. Hashimov, An effective estimate of nonlinear functionals 401
M. Hollander – R.M. Korwar, Nonparametric Bayesian estimation of the horizontal distance between two populations 409
L. Horváth, Two-sample problems under random censorship 417
M. Hušková, On bounded length sequential confidence interval for parameter in regression model based on ranks 435

Volume II

J. Jurečková, Tests of location and criterion of tails 469

B.K. Kim – J. Van Ryzin, On the asymptotic distribution of a histogram density estimator 483

L.B. Klebanov – R. Yanushkevichius, The estimates of stability for a theorem on the characterization by means of the identical distribution property 511

H.S. Konijn, Evaluation of a new treatment 515

H.L. Koul, Some weighted empirical inferential procedures for a simple regression model 537

A. Kozek – W. Wertz, Estimators with values in Banach spaces under convex loss and applications to curve estimation problems 567

G. Leunbach, Parameter-free inference in models with sufficient estimation 587

V. Mammitzsch, Is the distribution function of $f(X + Y) - X$ continuous, if X and Y are independent and have continuous distribution functions? 589

S.G. Mohanty, On some computational aspects of rectangular probabilities 597

U. Müller-Funk, On contiguity and weak convergence with an application to sequential analysis 619

U. Müller-Funk – H. Witting, On the rate of convergence in the CLT for signed linear rank statistics 637

V.N. Nair, Goodness of fit tests for multiply right censored data ... 653

E.G. Phadia, Nonparametric Bayesian inference based on censored data – an overview 667

B. Prasad – R.S. Singh, Nonparametric kernel estimates of a density function alongwith its derivatives 687

Z. Prášková, A local limit theorem and an asymptotic expansion for a two-sample rank test 713

M.L. Puri – N.S. Rajaram, Stochastic integrals and rank statistics 729
J.-P. Raoult, Some remarks on generalized Skorohod topology, in connection with weak convergence of multi-dimensional empirical processes (nonstationary φ-mixing case) 749
R.-D. Reiss, One-sided test for quantiles in certain nonparametric models 759
V.K. Rohatgi, Operator self-similarity 773
A. Sahanenko, On unimprovable estimates of the rate of convergence in invariance principle 779
K. Sarkadi, A direct proof for a ballot type theorem 785
I.R. Savage, Lehmann alternatives 795
W. Schlee, Nonparametric tests of the monotony and convexity of regression 823
E. Schumacher, Kendall's Tau, used as a coefficient of disarray between permutations with unoccupied places 837
P.K. Sen, The UI-principle and LMP rank tests 897
R.J. Serfling, Properties and applications of metrics on nonparametric density estimators 859
C. Stepniak, On testability of statistical hypotheses 875
G.J. Székely, On the paper of V. Mammitzsch (on the continuity of Borel functions of continuous random variables) 885
W.R. Van Zwet, On the Edgeworth expansion for the simple linear rank statistic 889

SCIENTIFIC PROGRAM

June 23, 1980

Morning session (Congress Hall)
Chairman: P. Révész

$9^{30} - 10^{00}$ Opening session
$10^{15} - 11^{00}$ W.R. van Zwet: On the Edgeworth expansion for the simple linear rank statistic
$11^{15} - 12^{00}$ D.R. Cox: The randomization theory of experimental design

Afternoon session

Session A
Chairman: Z. Govindarajulu

$14^{30} - 14^{50}$ P.K. Sen: The UI principle and LMP rank tests
$14^{55} - 15^{15}$ I.R. Savage: Lehmann models
$15^{20} - 15^{40}$ M. Csörgő – P. Révész: An invariance principle for N.N. empirical density functions

Interval

$16^{00} - 16^{20}$ R.J. Does – R. Helmers: Edgeworth expansions for functions of uniform spacings
$16^{25} - 16^{45}$ K. Sarkadi: A direct proof for a ballot type theorem
$16^{50} - 17^{10}$ O.I. Toskin: Control of multidimensional hypothesis about quantity of fractiles of continuous distributions

Session B
Chairman: V.S. Koroljuk

$14^{30} - 15^{15}$ J. Blum – V. Susarla – G. Walter: Estimation of the prior distribution using differential operators

Interval

$16^{00} - 16^{20}$ B. Epstein: Some nonparametric estimation techniques in reliability theory

$16^{25} - 16^{45}$ R. Zmyślony: On admissible estimation in linear models

$16^{50} - 17^{10}$ G. Leunbach: Parameter-free inference in models with sufficient estimation

June 24, 1980
Morning session

Session A
Chairman: V. Mammitzsch

$9^{00} - 9^{45}$ E. Hmaladze: The martingale approach in the theory of nonparametric goodness of fit tests

$9^{50} - 10^{10}$ S.S. Gupta – G.C. McDonald: Nonparametric procedures in multiple decisions (ranking and selection procedures)

Interval

$10^{30} - 10^{50}$ H.S. Konijn: Evaluation of a new treatment

$10^{55} - 11^{15}$ R.S. Sudakov: A confidence bound for function with preventing binomial parameters

$11^{20} - 11^{40}$ H. Callaert – P. Janssen: The convergence rate of fixed width sequential confidence intervals

$11^{45} - 12^{05}$ C. Stepniak: On testability of statistical hypotheses

试读结束：需要全本请在线购买： www.ertongbook.com

Session B

Chairman: B. Penkov

9^{00} – 9^{45} J. Jurečková: Tests of location and criterion of tails

9^{50} – 10^{10} B. Gyires: Linear rank statistics generated by uniformly distributed sequences

Interval

10^{30} – 10^{50} Z. Prášková: A local limit theorem and an asymptotic expansion for a two-sample rank test

10^{55} – 11^{15} M. Hušková: On bounded length sequential confidence interval for parameter in regression model based on ranks

11^{20} – 11^{40} D. Vorličková: Exact slopes for rank statistics for a two-sample problem under discrete distribution

11^{45} – 12^{05} T. Gerstenkorn: On some statistical problem joining the inflated Polya distribution to Bayes rule

Afternoon session

Session A

Chairman: D. Rasch

14^{00} – 14^{20} B. de Finetti: Aspects of heuristics

14^{25} – 14^{45} V.K. Rohatgi: Operator self-similarity

14^{50} – 15^{10} H. Grimm: Transformation of variables versus nonparametrics

Interval

15^{30} – 15^{50} G. Enderlein: Hierarchical clustering methods

15^{55} – 16^{15} M. Ghosh – R. Dasgupta: Berry – Esseen theorems for U-statistics in the non i.i.d. case

16^{20} – 16^{40} Z. Grabos: Some applications of spectral decomposition of a matrix in analysis of variance

16^{45} – 17^{05} C. Domański: Notes on the Theil test for the hypothesis of linearity for the model with two explanatory variables

Session B

Chairman: H. Witting

$14^{00} - 14^{20}$ K. Jogdeo: Nonparametric methods for gross error models involving location parameters

$14^{25} - 14^{45}$ V.S. Koroljuk – Y.V. Borovskih: Analytical method in theory of rank statistics

$14^{50} - 15^{10}$ Z. Govindarajulu: Asymptotic normality of linear combinations of functions of order statistics in one and several samples

Interval

$15^{30} - 15^{50}$ U. Müller-Funk: On contiguity and weak convergence with an application to sequential analysis

$15^{55} - 16^{15}$ W. Schlee: Nonparametric tests of the monotony and convexity of regression

$16^{20} - 16^{40}$ S.A. Hashimov: An effective estimate of nonlinear functionals

$16^{45} - 17^{05}$ G. Sadasivan: Within pair order effects in paired comparisons

June 26, 1980
Morning session

Session A
Chairman: J. Blum

9^{00} – 9^{20} J.K. Ghorai – A. Susarla – V. Susarla – J. Van Ryzin: Nonparametric estimation of mean residual life time with censored data

9^{25} – 9^{45} E.G. Phadia: Nonparametric Bayesian inference based on censored data – an overview

9^{50} – 10^{10} V.N. Nair: Goodness of fit tests for multiply right censored data

Interval

10^{30} – 10^{50} N. Reid: Nonparametric estimation for censored data

10^{55} – 11^{15} R. Thrum: Convergence of quadratic forms and applications in mixed models

11^{20} – 11^{40} B. Levit: On asymptotic optimality of nonparametric estimators

11^{45} – 12^{05} B. Prasad – R.S. Singh: Nonparametric kernel estimates of a density function alongwith its derivatives

Session B

Chairman: V.K. Rohatgi

9^{00} – 9^{20} G. Halász: Nonparametric regression and density estimations for smooth functions

9^{25} – 9^{45} B. Kim – J. Van Ryzin: On the asymptotic distribution of a histogram density estimator

9^{50} – 10^{10} M.A. Mirzahmedov: Nonparametric estimation of probability density

Interval

10^{30} – 10^{50} R.J. Serfling: Properties and applications of metrics on nonparametric density estimators

10^{55} – 11^{15} A. Kozek – W. Wertz. Estimators with values in Banach spaces under convex loss and applications to curve estimation problems

11^{20} – 11^{40} H.L. Koul: Some weighted empirical inferential procedures for a simple regression model

11^{45} – 12^{05} P. Deheuvels: Some applications of the dependence functions to statistical inference: nonparametric estimates of extreme values distributions, and a Kiefer type universal bound for the uniform test of independence

Session C

Chairman: B. Epstein

9^{00} – 9^{20} K.A. Borovkov: On the rate of convergence in the generalized invariance principle

9^{25} – 9^{45} E. Schumacher: Kendall's Tau, used as a coefficient of disarray between permutations with unoccupied places

9^{50} – 10^{10} P. Stolarski: A nonparametric method for classification based on orthonormal series

Interval

10^{30} – 10^{50} W.R. Allen: On Kolmogorov bounds for survival functions when there are losses as well as deaths

10^{55} – 11^{15} V. Mammitzsch: Is the distribution function of $f(X + Y) - X$ continuous, if X and Y are independent and have continuous distribution functions?

11^{20} – 11^{40} M.L. Puri – N.S. Rajaram: Stochastic integrals and rank statistics

Afternoon session

Session A
Chairman: P.K. Sen

$14^{00} - 14^{20}$ E. Csáki: On the standardized empirical distribution function

$14^{25} - 14^{45}$ I.S. Borisov: An approximation of empirical fields

$14^{50} - 15^{10}$ A. Sahanenko: On unimprovable estimates of the rate of convergence in invariance principle

Interval

$15^{30} - 15^{50}$ J.-P. Raoult: Some remarks on generalized Skorohod topology, in connection with weak convergence of multi-dimensional empirical processes (non-stationary φ-mixing case)

$15^{55} - 16^{15}$ S. Csörgő: The empirical moment generating function

$16^{20} - 16^{40}$ H.-G. Müller: Uniformly consistent kernel estimates of a multivariate regression function and of its mixed partial derivatives

Session B
Chairman: W. Wertz

$14^{00} - 14^{45}$ K.B. Athreya – P. Ney: Some aspects of ergodic theory and laws of large numbers for Harris-recurrent Markov chains

$14^{50} - 15^{10}$ W. Jahn: Regression analysis under the condition that the determinant of the covariance matrix is small

Interval

$15^{30} - 15^{50}$ D. Dabrowska: Parametric and nonparametric models with special schemes of stochastic dependence

$15^{55} - 16^{40}$ D. Rasch – G. Herrendörfer. Optimum experiment design and analysis – estimating the regression function

试读结束：需要全本请在线购买： www.ertongbook.com