Universität Rostock

Traditio et Innovatio

Some Remarks on the Early Career of Arnold Janssen

Hartmut Milbrodt, Rostock

“Der Nachwuchs wird gemeinsam alt…”

1. Striving for a Convincing Title
2. The 80s: A Difficult Decade to Start a Career in Statistics
3. Vita: Arnold Janssen and his Research
4. Teaching: PhD Students of Arnold Janssen
5. Organizing Conferences
6. Finally: “Niemals geht man so ganz”

Illustrative Material

1. Striving for a Convincing Title

- **After the Great Party — Scientific Career in the 80s**
- **The Carnival was Over . . .** (The Seekers)

  In fact: Compensation of historically grown deficits in statistics
  & expansion of the German university system
  $\longrightarrow$
  Job miracle in Statistics at German universities in the 70s
  & downward slope of the pig cycle in the 80s.

- **The Long Search: A Career between Probability and Statistics**

  In fact: A self-made career guided by own search rather than by support from a scientific network

- **. . . through the Eyes of an Actuary . . .**

  In fact: A fragment of a title, disclosing that I can offer only a limited view.

Some Remarks on the Early Career of Arnold Janssen

- Hopefully a fairly modest title
- Indicating a restriction to $\approx$ the first half of the career up to now (well before the turn of the century).

2. The 80s: A Difficult Decade to Start a University Career in Statistics

Time Reversal $\longrightarrow$ **How long do 65 years last in reality ?**

A short flashback: 1952 – 65 = 1887, a few years before Statistics was born as a mathematical discipline.

- David Hilbert (1900, 6th problem) regarded Probability as a part of Physics to be axiomatized by Mathematicians; no mention of Statistics at all.
- Early 20th century: Foundation of Mathematical Statistics as biometrically oriented discipline in the U.K. (Karl Pearson, William Gosset/Student, Sir Ronald Aymler Fisher).
- Nothing comparable in Germany. Single tender plants later:
  - Felix Bernstein (applications to Genetics and Actuarial Mathematics; emigration in 1934)
  - Richard von Mises (various contributions: Axiomatization, Goodness of fit-tests, functionals of the edf; emigration in 1933)

— Emil Julius Gumbel (Extreme value theory; emigration in 1933).

$\longrightarrow$ **Afterwards "tabula rasa" in German Mathematical Statistics.**

■ **Systematic new start since 1955,** importing the tremendous scientific progress in Statistics achieved so far abroad (notably also by "Hitler's Gift" [famous book by Medawar & Pyke] to the U.K. & U.S.A.):

— Leopold Schmetterer, Hamburg 1956 – 1961 (1956: *Einführung in die Mathematische Statistik*)

— Johann Pfanzagl, Cologne 1960 – 1993

— Hermann Witting, Münster and Freiburg, 1962 – 1971 – 1992.

■ **Expansion of the University system** in the 60s and 70s. Viz. NW:

— 4 full public universities before 1962 (AC, BN, K, MS)

— 10 more full public universities until 1974 (HHU Düsseldorf 1965 ...)

■ **&** ■ $\longrightarrow$ **The job party ended abruptly.** (Nevertheless successful careers remained possible: Arnold Janssen, ...)

— Mathematics Department in Münster: Not one retirement 1974 – 1989

— "When appointed in 1974, I was the youngest professor at my department, and that remained true until 1989." (Source not found again.)

3. Vita: Arnold Janssen and his Research

■ Studying mathematics with a major in statistics in Münster 1972 – 1977

Statistics based on the books by Lehmann (*Testing Statistical Hypotheses*) and Witting (*Mathematische Statistik*, *Angewandte Mathematische Statistik*), hence based on tools from measure theoretic probability, analysis and optimization.

Diploma Thesis in 1977 on measurable Lebesgue decompositions of kernels (Supervisor **Detlev Plachky**). Problem from measure theory, motivated by the decomposition of decision functions (also: actuarial payment functions).

■ PhD Studies, Habilitation and Assistant Professor in Dortmund 1977 – 1984

Influence of Wilfried Hazod and the Heyer school for probability theory on topological groups (Heyer book 1977: *Probability Measures on Locally Compact Groups*).

PhD Thesis 1979 on convolution semigroups, translation parameter families and Lévy-Khintchine formulae on locally convex spaces and locally compact groups (Title: *Zulässige Translationen von Faltungshalbgruppen*, Supervisor Wilfried Hazod).

First contacts with LeCam's theory of Statistical Experiments ≈ 1980:

— Via Eberhard Siebert (a PhD student of Heyer) and his Habilitation Thesis on *Statistical Experiments and their Conical Measures* (Z. Wahrscheinlichkeitstheorie verw. Geb. 1979)

— Via **Helmut Strasser's** talk *Limesverhalten von Produkten Statistischer Experimente* (May 11, 1981)

— Via fragments and preprints of Helmut Strasser's book *Mathematical Theory of Statistics. Statistical Experiments and Asymptotic Decision Theory* (1985).

$\longrightarrow$ Attracted by the structural and methodological similarities between the theories of infinitely divisible distributions and infinitely divisible statistical experiments.

Habilitation Thesis 1982: *Unendlich teilbare statistische Experimente.*

Conclusio. Opening up of two new fields of own research ("R"):

(R.1) Convolution Semigroups, Infinitely Divisible Distributions.

— Significant paper: *Zero-one laws for infinitely divisible probability measures on groups* (Z. Wahrscheinlichkeitstheorie verw. Geb. 1982, Spin-off from the PhD Thesis).

(R.2) Abstract Theory of Statistical Experiments.

— **LN Statistics (Arnold Janssen, M., Helmut Strasser) 1985:** *Infinitely Divisible Statistical Experiments.* Highlight: Characterization of Poisson experiments (as experiments represented by families of distributions of generalized Poisson processes). Spin-off from the Habilitation Thesis.

■ Associate Professor of Mathematical Statistics in Siegen 1984 – 1992

(R.2) Continued research within the Abstract Theory of Statistical Experiments with contributions to the convergence theory of scale invariant and translation invariant experiments. Significant papers:

— *Comparison of location models of Weibull type samples and extreme value processes.* (Probab. Theory Related Fields 1988, joint with Rolf-Dieter Reiß). How much information is contained in "the k smallest of n observations"?

— *On statistical information of extreme order statistics, local extreme value alternatives and Poisson point processes* (J. Multivariate Anal. 1994, joint with Frank Marohn. PhD Thesis of Marohn 1990)

— *Conditions for local asymptotic normality of exponential families* (Stat. Decis. 1992). Methods from extreme value theory.

Influence of Rolf-Dieter Reiß and his research group in extreme value theory (Michael Falk, Daniel Janas, Edgar Kaufmann, Wolfgang Kohne, Frank Marohn and later Holger Drees . . .)

Opening up three other fields of own research:

(R.3) Probabilistic Extreme Value Theory.

As examples three closely related papers considering convergence of sums of order statistics in the i.i.d. case:

— *Uniform convergence of sums of order statistics to stable laws.* (Probab. Theory Related Fields 1988). Convergence in variational distance

— *The domain of attraction of stable laws and extreme order statistics.* (Prob. Math. Statist. 1989)

— *On the rate of convergence of sums of extremes to a stable law.* (Probab. Theory Related Fields 1990, joint with David Mason)

A considerable part of Arnold's research activities, which at that time I did not perceive adequately. (Sorry !)

(R.4) In the footsteps of Jaroslav Hajék: Application of LeCam's theory to rank tests with a focus on weakening regularity conditions (almost regular models, non-regular models, irregular models leading to Poisson limit experiments).

— **LN Statistics (Arnold Janssen, David Mason) 1990:** *Non-Standard Rank Tests.* Locally most powerful rank tests; asymptotic theory under contiguous alternatives. Focus on tests based on minimum ranks. Very nice appendix on statistical experiments with non-regular densities.

(R.5) Survival analysis with emphasis on testing.
Starting points were LAN-approximations, (conditional) rank tests conditioned on the censoring indicators and a local reparametrization of survival/lifetime models in terms of hazard rate derivatives going back to Efron, Johnstone, Ritov and Wellner):

— *Local asymptotic normality for randomly censored models with applications to rank tests.* (Statist. Neerlandica 1989)

— *Optimal k-sample tests for randomly censored data.* (Scand. J. Statist. 1991)

— *Conditional rank tests for randomly censored data.* (Ann. Statist. 1991)

■ Full Professor of Probability and Mathematical Statistics in Düsseldorf since 1992

"Local influence" from applications of statistics in "Human Life Sciences". Joachim Krauth (Chair for Mathematical Psychology until 2005). Institute for Biometrics and Epidemiology at the German Diabetes Center (Helmut Finner, Guido Giani . . .). More relevant in Arnold's later "Düsseldorf period" ($\longrightarrow$ PhD theses).

(R.5) Continued research in survival analysis. Early significant papers:

— *On local odds and hazard rate models in survival analysis.* (Statist. Probab. Lett. 1994)

— *A hazard-based approach to dependence tests for bivariate censored models.* (Math. Methods Statist. 2000, joint with **Jörg Rahnenführer** and based on his PhD Thesis)

(R.3) Continued research in probabilistic extreme value theory: Extension of the research on convergence of sums of order statistics to the i.n.i.d. case and to invariance principles. Significant papers:

— *Sums of independent triangular arrays and extreme order statistics.* (Ann. Probab. 1994)

— *Invariance principles for sums of extreme sequential order statistics attracted to Lévy processes.* (Stochastic Process. Appl. 2000)

— *The influence of sequential extremal processes on the partial sum process.* (Extremes 2013, joint with **Markus Pauly**)

Opening up other fields of own research:

(R.6) Principal components of nonparametric power functions.
(Inspired by papers of Durbin & Knott and of Neuhaus on the Cramér-von Mises test and by M. & Strasser on the Kolmogorov-Smirnov test.)

Basic theme: The power is "flat" apart from a finite-dimensional space of directions of alternatives (which can be identified or adapted).

— *Rényi type goodness of fit tests with adjusted principal direction of alternatives* (Scand. J. Statist. 1993, joint with M. [my last paper in statistics — apart from the Pfanzagl jubilee paper]; bridge from survival analysis to principal components of nonparametric tests).

— *Principal component decomposition of non-parametric tests* (Probab. Theory Related Fields 1995). Generalizes the expansion of power functions to arbitrary tests in Gaussian shift experiments (non-asymptotic).

— *Global power functions of goodness of fit tests* (Ann. Statist. 2000). Includes "locally global" considerations, asymptotic analysis and data driven tests.

— *Regions of alternatives with high and low power for goodness-of-fit tests.* (J. Statist. Plann. Inference 2008, joint with Hülya Ünlü and based on her PhD Thesis)

(R.7) Resampling methods: Bootstrap and permutation tests.

(R.8) Multiple testing.

4. Teaching: PhD Students of Arnold Janssen

(1) Claus-Dieter Mayer (1996): (R.5), Survival analysis
Projection tests for the two-sample problem with censored data

(2) Holger Hebben (1998): (R.7), Resampling
Studentized permutation tests for a generalized Behrens-Fisher problem with various sampling strategies

(3) Jörg Rahnenführer (1999): (R.5), Survival analysis
A hazard-based approach to dependence tests for bivariate censored models

(4) Michael Kunz (2000): (R.6), Principal components
Application of the theory of Gaussian shift experiments to the Kolmogorov-Smirnov test and the one-sided boundary crossing problem

(5) Thorsten Pauls (2002): (R.7), Resampling
Resampling methods and their application in nonparametric testing theory

(6) Vladimir Ostrovski (2006): Testing of functionals
Testing statistical functionals for two-sample problems

(7) Hülya Ünlü (2008): (R.6), Principal components
Regions of alternatives with high power for goodness-of-fit tests

(8) Markus Pauly (2009): (R.7), Resampling
Analysis of conditional tests by conditional central limit theorems for resampling statistics

(9) Martin Tiedje (2011): Mathematical Finance
Applications of the Likelihood Theory in Finance: Modelling and Pricing

(10) Andreas Knoch (2014): Estimation of functionals
Asymptotic estimation of functionals in the nonparametric case

(11) Philipp Heesen (2014): (R.8), Multiple testing
Adaptive step up tests for the false discovery rate (FDR) under independence and dependence

(12) Julia Benditkis (2015): (R.8), Multiple testing
Martingale Methods for Control of False Discovery Rate and Expected Number of False Rejections

(13) Marc Ditzhaus (2017): (R.6), Principal components ???
The Power for Signal Detection in High Dimensional Data Sets.

Summary: 13 PhD students since 1996

(R.5)	Survival analysis with emphasis on testing	**2 theses**
(R.6)	Principal components of nonparametric power functions	**3 theses**
(R.7)	Resampling methods: Bootstrap and permutation tests	**3 theses**
(R.8)	Multiple testing	**2 theses**
	Testing and estimation of functionals	**2 theses**
	Mathematical Finance	**1 thesis**

5. Organizing Conferences

Conferences organized jointly with Strasser & M.

Bayreuth Conferences on Statistics: A Forum for Young Statisticians in Germany and a germ cell for the "German Open Conference on Probability and Statistics GOCPS" (alias "GPSD", since 1993)

Erste Bayreuther Statistik-Tagung (Bayreuth)	July 4 – 7, 1985
Zweite Bayreuther Statistik-Tagung (Bayreuth)	July 2 – 5, 1987
Asymptotische Statistische Methoden (Dortmund) Asymptotic Methods in Statistics	July 6 – 9, 1989
Asymptotische Statistische Methoden (Siegen) Asymptotic Methods in Statistics	June 26 – 30, 1991

Status quo ante:

— High hurdles for participating in Oberwolfach conferences for young statisticians

— No general conference for stochastics in Germany in the early 80s

— Wanted: A Forum for (the) Mathematical Theory of Statistics.

Status quo post: GOCPS (1993, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010 2012, 2013, 2014, 2016, 2018).

Asymptotics for high dimensional statistical models (Mathematisches Forschungsinstitut Oberwolfach) December 12 – 17, 1994 (our final).

Another two Oberwolfach-Conferences on Statistics co-chaired by Arnold Janssen in 2003 (jointly with Rudy Beran and Georg Neuhaus) and 2011 (jointly with Aad van der Vaart and Jon A. Wellner).

6. Finally: “Niemals geht man so ganz”

$\approx$ “One never leaves completely”

Trude Herr (with Wolfgang Niedecken and Tommy Engel, all Cologne dialect and folk singers) in 1987, short before she moved from Cologne to the Fiji Islands.

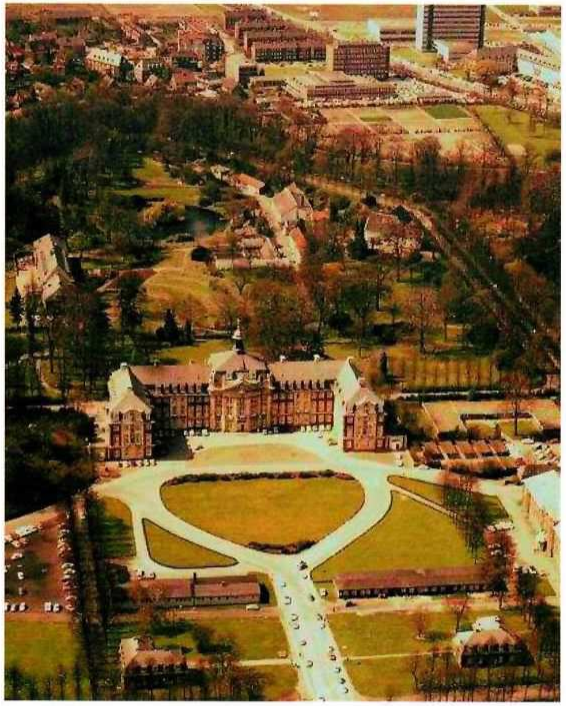
Congratulations Arnold to your Œuvre:
We are looking forward to (R.9), (R.10), . . .

VIELEN DANK FÜR IHRE AUFMERKSAMKEIT !

Illustrative Material

Norbert Schmitz

1959 – 2009



50 Jahre

Institut für Mathematische Statistik

der

Westfälischen Wilhelms-Universität Münster

Meßbare Lebesgue-Zerlegung von Kernen

DIPLOMARBEIT

Dem Fachbereich Mathematik der Westfälischen Wilhelms-Universität vorgelegt von

A R N O L D J A N S S E N

aus Forlitz-Blaukirchen (Ostfriesland)

1 9 7 7

Zulässige Translationen von Faltungshalbgruppen

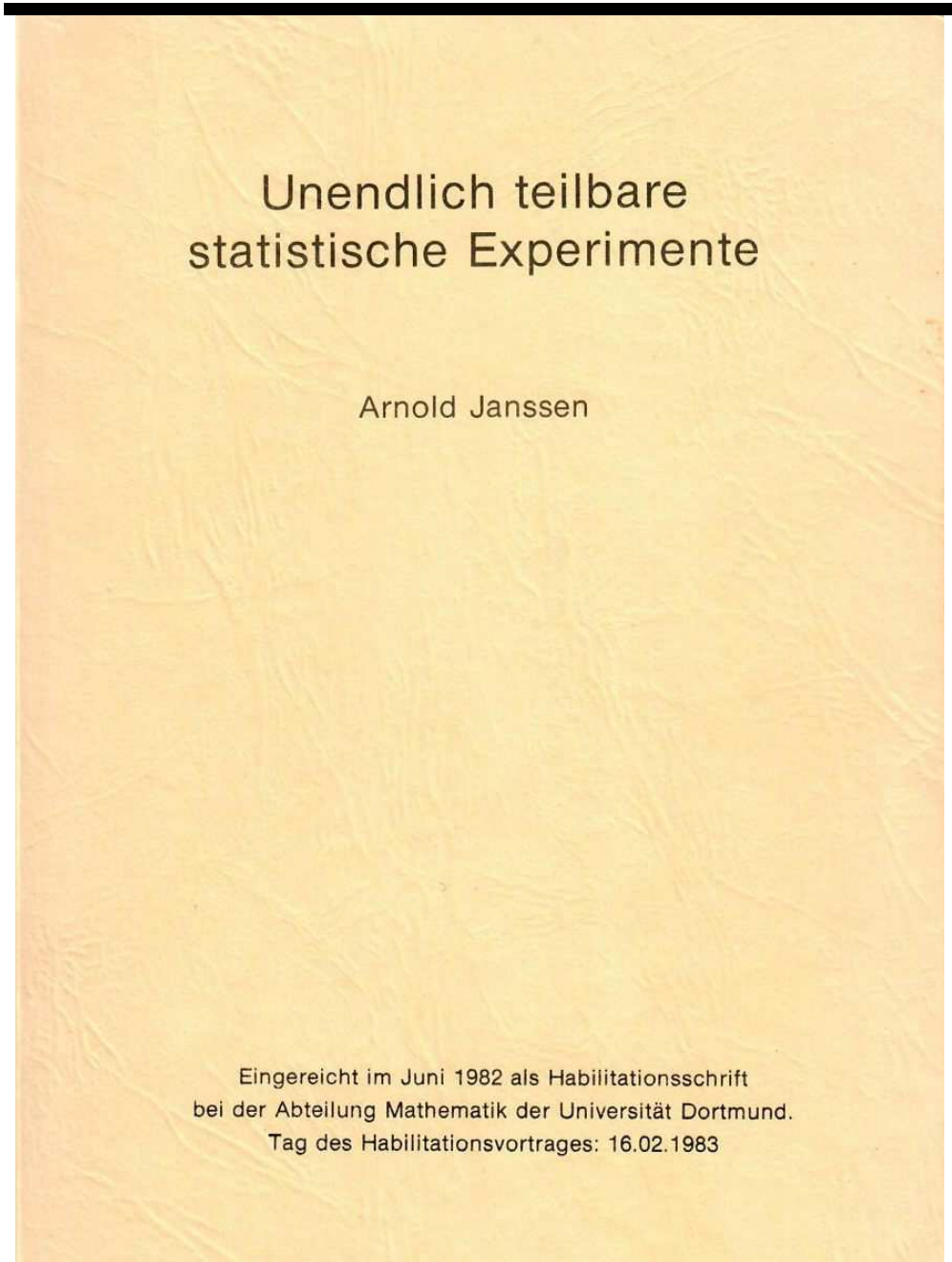
Dissertation

zur Erlangung des Grades eines Doktors
der Naturwissenschaften
der Abteilung Mathematik der Universität Dortmund

vorgelegt von

Arnold Janssen
aus Forlitz-Blaukirchen (Ostfriesland)

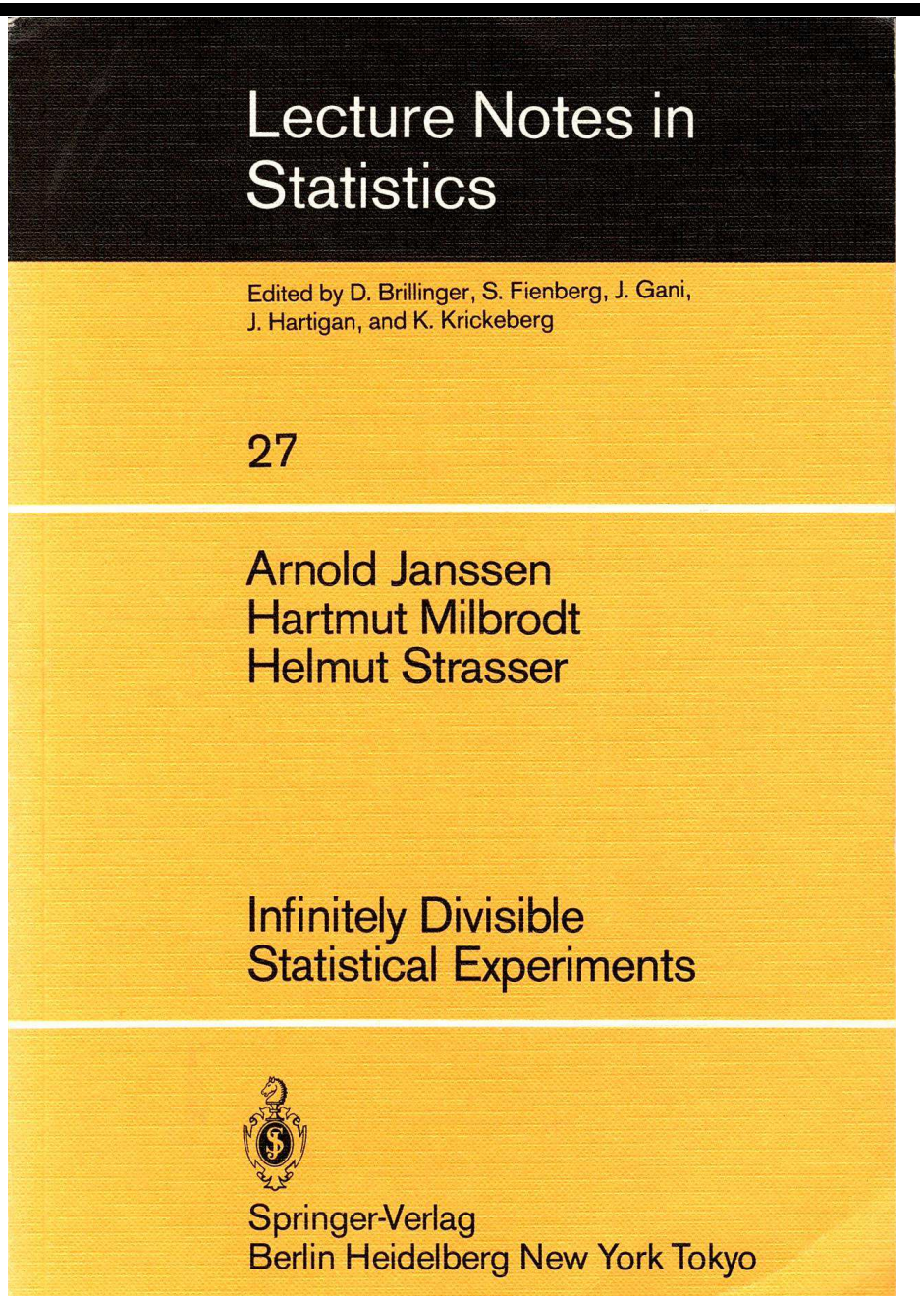
1979



Unendlich teilbare statistische Experimente

Arnold Janssen

Eingereicht im Juni 1982 als Habilitationsschrift
bei der Abteilung Mathematik der Universität Dortmund.
Tag des Habilitationsvortrages: 16.02.1983



Lecture Notes in Statistics

Edited by D. Brillinger, S. Fienberg, J. Gani, J. Hartigan, and K. Krickeberg

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Arnold Janssen
Hartmut Milbrodt
Helmut Strasser

Infinitely Divisible Statistical Experiments

Springer-Verlag
Berlin Heidelberg New York Tokyo

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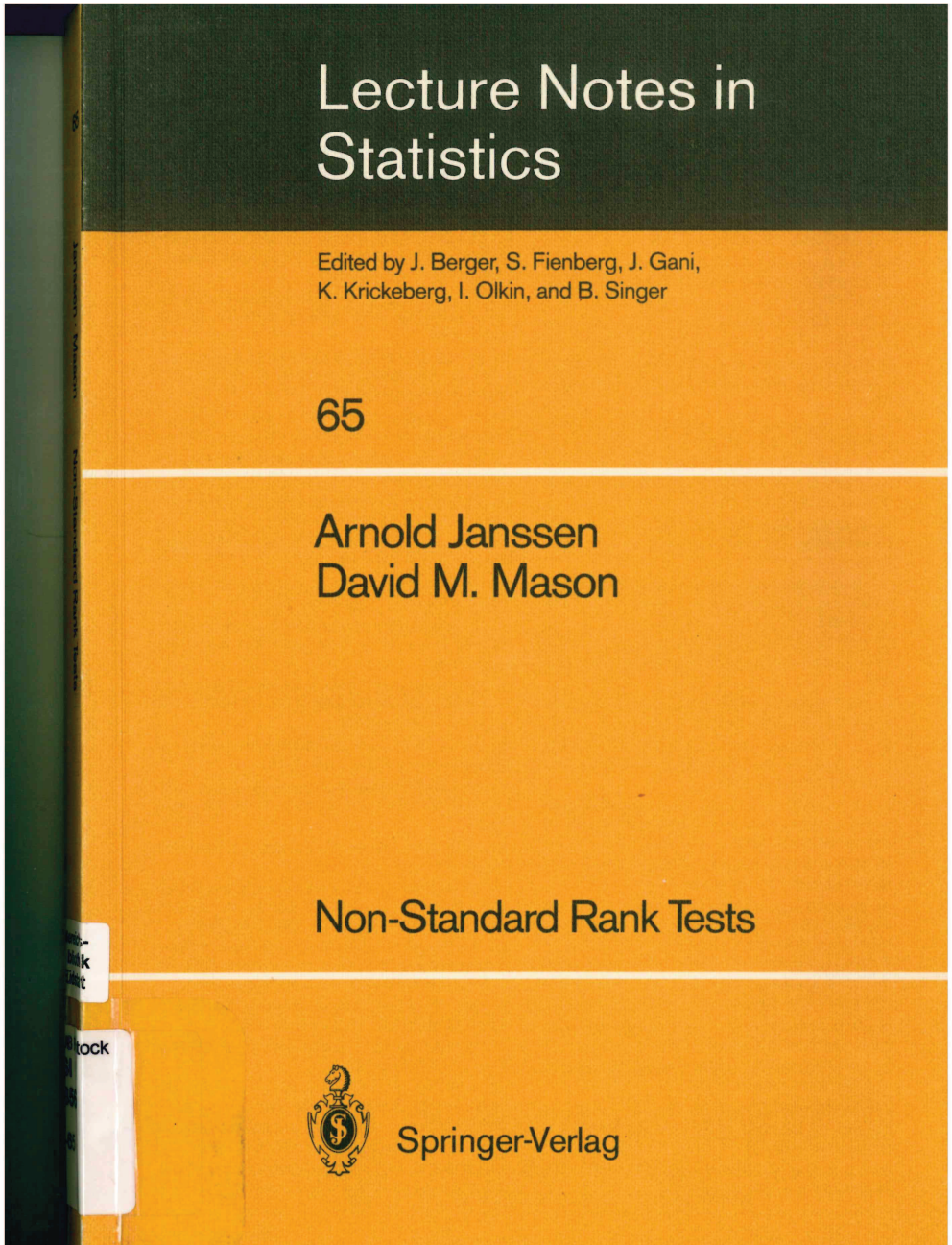
Lecture Notes in Statistics
Edited by J. Berger, S. Fienberg, J. Gani, K. Krickeberg, I. Olkin, and B. Singer
65
Arnold Janssen
David M. Mason
Non-Standard Rank Tests
Springer-Verlag

PROGRAMM DER STATISTIK - TAGUNG

Bayreuth, 5.7.1985 - 7.7.1985

DONNERSTAG, 4.7.1985: Anreisetag

FREITAG, 5.7.1985:

Vormittag: Chairman D.W. Müller (Heidelberg)

9.00 - 9.45 G. Neuhaus (Hamburg)
Lokale Asymptotik bei linearen Rangtests mit geschätzten Scores

10.00-10.30 W. Stadje (Osnabrück)
Schätzprobleme bei Stichproben mit Meßfehlern

Kaffee- / Teepause

11.15-12.00 H. Rieder (Bayreuth)
Die nichtparametrische LAM Schranke, oder, ein $0 - \infty$ Gesetz für den Bias

Möglichkeit zum Mittagessen in der Mensa

Nachmittag: Chairman E. Siebert (Tübingen)

14.00-14.45 E. Mammen (Heidelberg)
Optimale lokale Normalapproximation exponentieller Familien

15.00-15.45 H. Milbrodt (Bayreuth)
Asymptotische Theorie von Stichproben-experimenten

Kaffee- / Teepause

16.30-17.15 A. Janssen (Siegen)
Limites von translationsinvarianten Experimenten

17.30-18.00 H. Zeuner (Tübingen)
Zusammengesetzte Poissonexperimente

N a c h s i t z u n g

SAMSTAG, 6.7.1985:

Vormittag: Chairman L. Rüschendorf (Freiburg)

9.00 - 9.45 U. Müller-Funk (Freiburg)
Thema aus dem Bereich der Sequential-analyse

10.00-10.45 R. Rhiel (München)
Boundary-Crossing und optimales Stoppen bei der Konstruktion von Bayes-optimalen Sequenztests

Kaffee- / Teepause

11.30-11.50 W. Wefelmeyer (Köln)
Lokale asymptotische Normalität mit Konvergenz-raten

12.00-12.30 I. Bomze (Wien)
Zur Theorie der erwartungstreuen Schätzfunk-tionen

Möglichkeit zum Mittagessen

Nachmittag: Gemeinsamer Ausflug

SONNTAG, 7.7.1985

Vormittag: Chairman K. Behnen (Hamburg)

9.00 - 9.45 W. Großmann (Wien)
Adaptive Methoden

10.00-10.45 J.-P. Kreiß (Hamburg)
(Adaptive) Schätz- und Testverfahren bei ARMA-Modellen

Kaffee- / Teepause

11.30-12.15 G. Pflug (Gießen)
Adaption in abhängigen Fällen

Möglichkeit zum Imbiß im Institut

Akademie der Wissenschaften der DDR

Karl-Weierstraß-Institut für Mathematik

AdW der DDR · Karl-Weierstraß-Institut für Mathematik
Mohrenstraße 39 · Berlin · DDR - 1086

Prof. Dr. Helmut Strasser
Lehrstuhl f. Angewandte Mathematik
Universität Bayreuth
Postfach 10 12 51
D-8580 BAYREUTH
BRD

Ihre Zeichen	Ihre Nachricht vom	Fernsprechangabe	Unsere Zeichen	Datum
		20770		

Betreff:

6. 2. 1989

Sehr geehrter Herr Professor Strasser,

Ich danke Ihnen vielmals für Ihre Einladung zur Tagung über Asymptotische Entscheidungstheorie und nehme sie sehr gern an. Das Thema meines Vortrages wäre "Risikoschranken vom Hajek-Le Cam-Typ in der nichtparametrischen Regression" (Risk bounds of Hajek-Le Cam type in nonparametric regression). Weiterhin hätte ich gern einige Informationen über die vorgesehene Dauer des Vortrages und über den Teilnehmerkreis (um zu wissen, welche Spezialisierung anzunehmen ist, und ob Deutsch möglich ist).

Ich bin sicher, daß das Zusammentreffen mit einer Schule theoretisch orientierter Statistiker für mich von großem Nutzen sein wird.

Mit freundlichen Grüßen

Michael Nussbaum

Michael Nussbaum

Karl-Weierstraß-Institut für Mathematik
Akademie der Wissenschaften der DDR
Mohrenstr. 39
Berlin
DDR-1086

Tagungsprogramm

Donnerstag, den 6. Juli 1989:

ab 19^{30} *"Vorsitzung" im Hotel/Restaurant Handelshof, Mengeder Straße 664, DO-Mengede*

Freitag, den 7. Juli 1989:

Vormittag: Chairman G. Neuhaus (Hamburg)

8^{30}–8^{35} Begrüßung

8^{35}–9^{35} F. Götze (Bielefeld)
Approximationen in funktionalen Grenzwertsätzen mit Anwendungen auf das Bootstrap.

9^{55}–10^{20} M. Falk (Siegen)
Überdeckungswahrscheinlichkeiten von Bootstrap-Konfidenzintervallen für Quantile.

10^{35}–11^{05} E. Mammen (Heidelberg).
Bootstrap in hochdimensionalen linearen Modellen.

11^{20}–11^{45} U. Müller-Funk (Münster)
Über Differentiale und Projektionen.

12^{00}–12^{30} R. Dahlhaus (Heidelberg)
Empirische Spektralprozesse und deren Anwendung in der Zeitreihenanalyse.

Mittagspause, Gelegenheit zum Mittagessen in der Mensa

Nachmittag: Chairman R. Dahlhaus (Heidelberg)

14^{00}–15^{00} J.-P. Kreiß (Hamburg)
Bootstrap-Verfahren in der Zeitreihenanalyse.

15^{15}–15^{40} H. Luschgy (Münster)
LAMN von Modellen für Diffusionsprozesse.

Kaffee- /Teepause

16^{25}–16^{50} R. Höpfner (Freiburg)
LAN/LAMN für null-rekurrente Markovprozesse.

17^{00}–17^{25} W. Wefelmeyer (Köln)
Effizientes nichtparametrisches Schätzen bei stochastischen Prozessen.

17^{35}–18^{00} L. Rüschendorf (Münster)
Statistische Probleme in Punktprozessen.

ab 18^{30} *Nachsitzung im Restaurant Wiewaldi, DO-Groß-Barop, Ecke Baroper Straße – H.-Heimsath-Straße*

Samstag, den 8. Juli 1989:

Vormittag: Chairman M. Falk (Siegen)

8^{30}–9^{00} W. Grossmann (Wien)
Semiparametrische Modelle für Verlaufskurven.

9^{10}–10^{10} M. Nussbaum (Berlin/Ost)
Risikoschranken vom Hájek-LeCam Typ in der nichtparametrischen Regression.

Kaffee- /Teepause

10^{45}–11^{15} H. Witting (Freiburg)
Asymptotik eines bedingten Rangtests.

11^{25}–11^{50} G. Neuhaus (Hamburg)
Rangtests bei konkurrierenden Risiken.

12^{00}–12^{25} H. Strasser (Bayreuth)
Asymptotisches Testen mit hochdimensionalen Alternativen.

Gemeinsamer Ausflug

Sonntag, den 9. Juli 1989:

Vormittag: Chairman V. Mammitzsch (Marburg)

9^{15}–9^{45} W. Stadje(Osnabrück)
Ungleichungen für die Verwerfungswahrscheinlichkeiten des sequentiellen Quotiententests.

10^{00}–10^{20} K.C. Klauer (Berlin/West)
Anwendung asymptotischer Entscheidungstheorie auf Probleme der psychologischen Testtheorie.

10^{30}–11^{20} W. Ehm (Heidelberg)
"n-freie" Asymptotik für log-lineare und verwandte Modelle.

11^{30}–12^{20} W. Stute (Gießen)
Bedingte U-Statistiken.

ab 12^{45} *Imbiß und Tagungsausklang im Foyer des Mathematikgebäudes*

Die angegebenen Vortragszeitspannen schließen die jeweilige Vortragsdiskussion nicht mit ein. Alle Vorträge finden im **Hörsaal E29** des Mathematikgebäudes der Universität Dortmund (Campus Nord) statt.

Dortmund, Mai 1989