

Institute of Mathematical Statistics and Actuarial Science



Prof. Dr. Lutz Dümbgen

Professor of Statistics / Director of IMSV

Institute of Mathematical Statistics and Actuarial Science
(IMSV)

Phone

+41 31 684 88 02

E-Mail	lutz.duembgen@unibe.ch
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Office	006
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Postal Address	Alpeneggstrasse 22 CH-3012 Bern
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Consultation Hour	Please arrange a date by e-mail
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Research Interests

Research Interests

- Nonparametric Statistics
(Tests and confidence regions in curve estimation, estimation of distributions under shape constraints)
- Multivariate Analysis
(Classification and discriminant analysis, M-estimation of scatter)
- Statistical Computing
(Exact confidence regions, Nonparametric ML-estimation, Regularization methods)
- Foundations
(Explicit bounds for distributional approximation errors)

Publications

Publications

[Preprints](#)

[Mathematical and Statistics Journals](#)

[Journals in other Fields](#)

[Proceedings, Collections, Book Chapters](#)

[Technical Reports and Working Papers](#)

[Textbooks and Lecture Notes](#)

[Software](#)

Memberships and Service

Memberships and Service

Current memberships

- [Institute of Mathematical Statistics](#) (IMS Fellow since June 2016)
- [International Statistical Institute](#) (Elected Member since October 2006) and [Bernoulli Society](#)
- [Swiss Statistical Society](#)

Service in scientific societies and meetings

- April 2000 - March 2004: Member of the Committee of the Fachgruppe Stochastik (DMV); responsible for internet services (St-Net)
- January 2005 - August 2015: Member of the Committee of the Section Education and Research within the Swiss Statistical Society
- April 2009 - January 2016: Member of SNSF panels for Ambizione Grants and Junior Professorships
- Since January 2005: Local coordinator of the Swiss Statistics Seminars
- Joint Statistical Meetings 2003, San Francisco: Program committee (IMS: Contributed sessions)
- 56th Session of the ISI, August 2007, Lisboa: Program committee (Bernoulli Society)
- Swiss Statistics Meeting and International Conference Ars Conjectandi, October 2013, Basel: Program committee
- Swiss Statistics Meeting, August 2015, Bern: Program committee
- European Meeting of Statisticians, July 2019, Palermo: Chair of scientific program committee

Editorial service

- October 2002 - September 2005: Associate editor of *Statistica Sinica*
- January 2004 - March 2008: Associate editor of *Biometrical Journal*
- August 2008 - December 2011: Associate editor of *Journal of Nonparametric Statistics*
- January 2010 - April 2013: Executive editor (IMS) of *Statistics Surveys*
- January 2004 - December 2015: Associate editor of *The Annals of Statistics*
- January 2018 - April 2020: Associate editor of *Journal of the American Statistical Association (Theory and Methods)*

- January 2012 - December 2024: Associate editor of *Journal of Statistical Planning and Inference*
- Since April 2015: Associate editor of *Statistica Neerlandica*
- Since August 2023: Reviewer for *Mathematical Reviews (AMS)*

Collaborators and Students

Collaborators and Students

Collaborators

Rudolf Beran (University of California at Davis)

Geurt Jongbloed (Technical University at Delft)

Arne Kovac (University of Bristol)

Axel Munk (University of Göttingen)

Klaus Nordhausen (University of Jyväskylä)

Angelika Rohde (University of Freiburg)

Kaspar Rufibach (Roche, Basel)

Richard Samworth (University of Cambridge)

A. Johannes Schmidt-Hieber (University of Twente)

Dominic Schuhmacher (University of Göttingen)

David Tyler (Rutgers University)

Guenther Walther (Stanford University)

Jon A. Wellner (University of Washington at Seattle)

Current PhD Students

- Heike Schuhmacher
- Philip A. Stange
- Tommaso Visonà
- Oliver Warth
- Didier B. Ryter

Former PhD Students

- Christof Strähl: *Nonparametric Estimation of Densities and Related Features*. (Dissertation, Bern 2020; co-advisor: Johanna F. Ziegel)
- Alexandre Mösching: *Distributional Regression under Shape and Order Constraints*. (Dissertation, Bern 2020)
- Petro Kolesnyk: *Bi-Log-Concave Distribution and Regression Functions*. (Dissertation, Bern 2016)
- Till Sabel: *Simultaneous Confidence Statements about the Diffusion Coefficient of an Itô-Process - with Application to Spot Volatility Estimation*. (Dissertation, Göttingen and Bern 2014; 1st advisor: Axel Munk)

- Aniña M. Pescatore: *Childhood Wheezing - Clinical Presentation Throughout Childhood and Predicting Persistent Wheeze*.
(Dissertation, Bern 2014; 1st advisor: Claudia Kühni)
- Niki R. Zumbrunnen: *P-Values for Classification: Computational Aspects and Asymptotics*.
(Dissertation, Bern and Göttingen 2014; 2nd advisor: Axel Munk)
- Ben D. Spycher: *Analysis of Phenotypic Variation in Childhood Wheezing Disorders*.
(Dissertation, Bern 2010; co-advisor: Claudia Kühni)
- A. Johannes Schmidt-Hieber: *Nonparametric Methods of Spot Volatility Estimation*.
(Dissertation, Göttingen and Bern 2010; 1st advisor: Axel Munk)
- Dirk Klingbiel: *Permutation Tests for Multivariable Regression*.
(Dissertation, Bern 2009)
- Jimmy P. Brignoni: *Modelling Transfer Processes*.
(Dissertation, Bern 2009; co-advisor: Markus Wäfler)
- André Hüsler: *New Aspects of Modeling with Log-Concave Densities*.
(Dissertation, Bern 2008)
- Angelika Rohde: *New Multiscale Approaches to Nonparametric Statistical Inference*.
(Dissertation, Bern and Heidelberg 2006; 2nd advisor: Rainer Dahlhaus)
- Kaspar Rufibach: *Log-Concave Density Estimation and Bump Hunting for I.I.D. Observations*.
(Dissertation, Bern and Göttingen 2006; 2nd advisor: Axel Munk)
- Bernd-Wolfgang Igl: *Multivariate Estimation and Calibration for Linear Models with Errors-in-Variables*.
(Dissertation, Bern 2004)
- Sandra Freitag: *Nonparametric Inference for Interval-Censored Data*.
(Dissertation, Lübeck 2003)

Diploma and Master Students

- Jonas Hofer: *Predicting Solar Energy Production from Meteorological Data*
(Master thesis in Statistics and Data Science, Bern 2024)
- Didier B. Ryter: *Asymptotic Tail Behavior of the Log-Concave NPMLE of a Univariate Density*
(Master thesis in Statistics and Data Science, Bern 2024)
- Lara Sommer: *Pricing Models in Non-Life Insurance*
(Master thesis in Statistics and Data Science, Bern 2024; co-advisor Michael Mayer)
- Oliver Warth: *Schätzung von Mittelwert und Varianz mittels Kern-Einbettung*
(Master thesis in Statistics and Data Science, Bern 2023)
- Geeta Goyal: *Neural Network Compression via Pruning based on Regularization*
(Master thesis in Statistics and Data Science, Bern 2023; co-advisor Paolo Favaro)
- Fabian Meyes: *Determination of Gaussianity of Multivariate Distributions via Estimation of Differential Entropy*
(Master thesis in Statistics and Data Science, Bern 2023)
- Lukas A. Lüthi: *Konfidenzbänder für isotone Quantilkurven mit Vorzeichentests*
(Master thesis in Statistics and Data Science, Bern 2021)
- Katrin M. Gysel: *P-values for Classification via Neural Networks and Kernel Logistic Regression*.
(Master thesis in Statistics, Bern 2020)
- Mirlind I. Mustafa: *Honest Confidence Bounds for a Mean*.
(Master thesis in Statistics, Bern 2018)
- Fabrice Perler: *Local Projection Pursuit*.
(Master thesis in Statistics, Bern 2017)
- Beatrice Balmer: *Modellierung von Spitalkosten*.
(Master thesis in Statistics, Bern 2017)
- Lukas Bossart: *Schätzung von wochentags-scharfen Quell-Ziel-Matrizen*.
(Master thesis in Statistics, Bern 2016; co-advisor Livio Käslin)

- Augustine Saugy: *Statistical Forecasting of Snow Avalanche Situations Using Field Measurements*. (Master thesis in Climate Sciences, Bern 2015; co-advisor Robert Bolognesi)
- Martin Bichsel: *Robust estimation of the error distribution in multivariate regression*. (Master thesis in Statistics, Bern 2015)
- Ellen M. van der Lans: *Modelling Pig Mortality: Syndromic Surveillance in Four Swiss Cantons by Applying a Poisson Point Process*. (Master thesis in Statistics, Bern 2015)
- Paul Ruppen: *Messen von Fähigkeiten und Einstellungen mittels Item Response Theorie*. (Master thesis in Statistics, Bern 2015)
- Bernhard Freiermuth: *Multiscale Testing and Regularization*. (Master thesis in Statistics, Bern 2014)
- Patric Bonadei: *Multidimensionale Taut Strings*. (Master thesis in Statistics, Bern 2013)
- Martin Bigler: *The Conjugate Gradient Algorithm for Smooth Functions*. (Master thesis in Mathematics, Bern 2012)
- Franziska Schöni-Affolter: *Association of community viral load and new HIV diagnoses in Switzerland: a cohort study*. (MAS thesis in Applied Statistics, Bern 2012)
- Heike Knötzsch: *Newton- und Quasi-Newton-Verfahren für multivariate M-Schätzer*. (Master thesis in Statistics, Bern 2010)
- Livio Kaeslin: *Approximationsfehler linearer und kubischer Splines*. (Master thesis in Mathematics, Bern 2010)
- Lukasz Piotrowski: *Local Projection Pursuit*. (MAS thesis in Applied Statistics, Bern 2010)
- Niki Zumbrunnen: *P-Values for Weighted Nearest-Neighbor Classifiers*. (Master thesis in Mathematics, Bern 2009)
- Kathrin Weyermann: *Ein Active-Set-Algorithmus für die Schätzung log-konkaver diskreter Verteilungen*. (Diploma thesis in Statistics, Bern 2008)
- Simon Wandel: *Some General Theory for Multivariate M-Estimation of Location and Scatter*. (Diploma thesis in Statistics, Bern 2006)
- Dirk Klingbiel: *Statistical Analysis and Visualization of Gene Expression Data*. (Diploma thesis in Computer Science, Lübeck 2003)
- Lars Hömke: *Detecting abrupt changes in profiles - with an application to cytoarchitectonic mapping*. (Diploma thesis in Computer Science, Lübeck 2003)
- Ulrich Erlenmaier: *Ein Anpassungstest für Markov-Zeitreihen*. (Diploma thesis in Mathematics, Heidelberg 1998)
- Perla Zerial: *Über Projektionen von hochdimensionalen Verteilungen*. (Diploma thesis in Mathematics, Heidelberg 1995)
- Holger Durst: *Anwendung des EM-Algorithmus auf lineare inverse Probleme*. (Staatsexamensarbeit, Heidelberg 1995)

Former Bachelor Students

Ivana Peric (2024), Anna L. Friedli (2024)
 Anna L. Grütter (2021), Didier B. Ryter (2021)
 Fabian Meyes (2021), Marco Zini (2020)
 Nathanael Glauser (2017), Katrin M. Gysel (2017)
 Lisa Holer (2017), Stefan Binder (2017)
 Barbara Baumann (2016), Nadine Seitlinger (2016)
 Manuela Häfliger (2014), Angela Singer (2012)

Bernhard Freiermuth (2011), Matthias Kirchner (2009)

Yves Bartels (2008), Gabriel P. Fischer (2008)

Thomas Wüthrich (2007)

Curriculum vitae

Curriculum vitae

At the [University of Heidelberg](#) I studied Mathematics with secondary subject Biology/Chemistry. There I joined Statlab within the Institute of Applied Mathematics and finished my PhD thesis about nonparametric change-point estimation in 1990. My advisor and mentor was Prof. D.W. Müller.

During 1990-1992 I spent two years at the [University of California at Berkeley](#) as a Research Fellow of the [Miller Insitute for Basic Research in Science](#). In particular this offered the opportunity to meet excellent scientists in the [Department of Statistics](#). Thereafter I returned to Heidelberg and, after a short stay at the [University of Bielefeld](#) in 1993, started working on my Habilitation thesis.

In 1996 the latter endeavor was finished, and in 1997 I accepted a position as Professor of Stochastics at the [\(Medical\) University at Lübeck](#). There I joined the [Mathematical Institute](#).

In March 2002 I started working at the [University of Bern, Switzerland](#), as a Professor of Statistics within the [Institute of Mathematical Statistics and Actuarial Science](#) and [Department of Mathematics and Statistics](#). In the spring of 2006 I received an offer from the University of Heidelberg, but finally my family and I decided to stay in Bern.