Dr. Boris Buchmann
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Mathematics and Statistics
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Personal Data

Born in Göttingen, Germany, October 22, 1969, German citizen.

University education at the University of Hannover in Germany

PhD (April 2001)
Mathematics : 'Sehr gut'.
Institute of Mathematical Stochastics,
Title of thesis:
Decompounding: an estimation problem for the compound Poisson distribution.
Supervisor: Prof. Dr. R. Grübel.

Diplom/Master (April 1997)
Mathematics (Minor: Physics): '1.0' (equivalent to A).
Title of the thesis:
Große Abweichungen bei stückweise deterministischen Markov-Prozessen.
(Large deviations of piecewise deterministic Markov processes.)
Supervisor: Prof. Dr. R. Grübel.

Vordiplom/Bachelor (March 1994)
Mathematics (Minor: Physics): '1.0' (equivalent to A).

Positions

Since September 2007	Lecturer School of Mathematical Sciences Monash Unversity
December 2005–September 2007	Research Fellow MASCOS & CMA The Australian National University
June 2005–November 2005	Postdoctoral Fellow Department of Statistics The Chinese University of Hong Kong

June 2004 – May 2005	Research Fellow MASCOS & CMA The Australian National University
April 2001 – March 2004	Wissenschaftlicher Angestellter Chair of Mathematical Statistics Center for Mathematical Sciences Munich University of Technology
April 1997 – March 2001	Wissenschaftlicher Mitarbeiter Institute of Mathematical Stochastics University of Hannover
October 1995 – March 1997	Student teaching assistent Institute of Mathematics University of Hannover
June 1989 – September 1990	Mandatory social service.

Teaching Experience

- *Probability Modelling and Applications MATH3029.* ANU, Semester 2/2007. Lecturer. Script, assignments and solutions, written exam.
- *Probability Modelling and Applications MATH3029.* ANU, Semester 2/2006. Tutor and guest lecturer. Script, assignments and solutions.
- *Stochastic analysis and Brownian motion.* Chinese University of Hong Kong, 2005. Lecturer. Assignments and solutions
- *Lecture series on Malliavin calculus/white noise analysis and fractional Brownian motion.* Chinese University of Hong Kong, April 2004. Lecturer.
- *Stochastic Models in Life Insurance Mathematics* (part of the curriculum of the Deutsche Aktuarsvereinigung [DAV/German society of actuaries]). Winter terms (WT) 2001/02, 2003/04, Munich University of Technology. Lecturer. Script and written exams.
- *Statistics lab (Splus/R).* WT 2002/03, 2003/04, Munich University of Technology. Coordinator and lecturer. Assignments and solutions.
- *Stochastic Analysis for Finance.* Summer term (ST) 2002, Munich University of Technology. Tutor and guest lecturer. Assignments, solutions and written exam.
- Tutor of the following lectures at the Munich University of Technology and the University of Hannover: *Probability Theory I* (ST 1996, 1997, 1998, 1999, 2001). *Probability Theory II* (WT 1996/1997, 1998/99 1999/2000. 2000/01). *Stochastic Processes* (WT 1998/99, ST 2000). *Large Deviation Theory* (WT 1997/98). *Topology and Functional Analysis* (WT 1996/1997). *Analysis I* (WT 1995/1996).

Complex Analysis I (ST 1996). *Mathematics for Engineers and Computer Scientists* (ST 2001, WT 2001/02). *Queueing Theory and Monte-Carlo Methods for Construction Engineers* (WT 98/99).

Supervised students

- Irmingard Eder: *Grosse Abweichungen in einem Marktmodell mit endogenen Preisen* (Large deviations in a Market model with endogenous prices). Research project. Munich University of Technology, 2004.
- Jannis Charisonas: *Schätzung der Prognosegenauigkeit bei der Ermittlung der Schadensrückstellungen auf Einzelfallbasis.* (On the prediction error for loss reserves). Master's thesis in cooperation with the reinsurance company MunichRe. Munich University of Technology, 2003.
- Bernhard Niesert: *Lokale Alternativen in Tests auf Überdispersion bei zusammengesetzten Poisson-Verteilungen* (Local alternatives in tests for over-dispersion within compound Poisson distributions). Diploma thesis (equivalent to Master's thesis). Munich University of Technology, 2002.

Administration, Professional and Outreach Activity

- Referee for *Annals of Applied Probability*, *Econometric Theory*, *Statistica Sinica*, *Journal of The American Statistical Association*, *Stochastic Processes and Applications*, *Journal of Applied Probability*.
- Committee member of the *Scientific Conference on Insurance and Finance* (Bonn, April 2003). This conference was a part of the yearly assembly of the professional body DAV (The German Society of Actuaries).
- Committee member of the *Scientific Conference on Insurance and Finance* (Weimar, April 2002). This conference was a part of the yearly assembly of the DAV (German Society of Actuaries).
- Committee member generating the B.Sc. curriculum in Mathematics at the University of Hannover.
- Assessor, Diplom and Vordiplom examinations in Mathematics.
- Computer administration (Munich University of Technology).

Computer skills

- Unix, Pascal, C, Scheme, Splus, R, Matlab, Maple.

Current Research Interests

- Nonparametric inference for stochastic processes, inference for nearly nonstationary time series with long range dependence, stochastic analysis.
- Fractional Brownian motions, Hermite processes, Lévy processes, empirical processes and point processes.
- Functional limits theorems, almost sure cluster sets, Euler schemes for odes in random environments, fluctuations of stochastic differential equations. Applications to evolutionary market models.

Research visits

- Munich University of Technology. December 2008, finalizing research project.
- ANU. November 2008, research on Lévy processes and small time behaviour.
- Chinese University of Hong Kong. December/January, 2006/07, finalizing research project.
- Chinese University of Hong Kong, June 2006, revision of a paper.
- University of Virginia. Research stay within the Emphasis Year of the IMS on Applied Probability and Mathematical Finance. January/February 2005, talk and research on Lévy processes.
- Chinese University of Hongkong, April 2004, Lecture series and initiation of joint research projects.

Talks at universities and academic meetings

- 2008: Invitation to "The Mathematics and Statistics of Quantitative Risk Management", Mathematisches Forschungsinstitut Oberwolfach, March.
- 2007: IGSSE Seminars, Munich University of Technology December; Time Series Analysis Workshop, Monash University, Melbourne, November; Colloqium, Monash University, Melbourne, October; Monash University, Melbourne, February; University of Manchester, January.
- 2006: 5th National Symposium on Financial Mathematics, Melbourne, September; IMS 69th Annual Meeting of the Institute of Mathematical Statistics, Rio de Janeiro, July/August.
- 2005: NSF/NBER Time Series Conference, Heidelberg, September; Probability Seminar, University of Virginia, January.

- 2004: Lecture series on Malliavin calculus/white noise analyis and fractional Brownian motion, Chinese University of Hongkong, April; Statistics in Finance workshop, Mathematisches Forschungsinstitut Oberwolfach, January.
- 2003: Yearly assembly DMV (German Mathematical Society), Rostock, September; Herrsching, Autumn School on Risk Management, September.
- 2002: Munich Spring School on Mathematical Finance, April; German Open Conference on Probability and Statistics, University of Magdeburg, March; Graduiertenkolleg, Technische Universität Berlin, January.
- 2000: Statistical Laboratory Seminars, University of Cambridge, October; German Open Conference on Probability and Statistics, Hamburg, March.

Book review

- Reiss, R.-D., Thomas, M. (2001) Statistical analysis of extreme values, from insurance, finance, hydrology and other fields. Extended 2nd edition, Birkhäuser Boston. Reviewed in *Statistics & Decisions,* **20***, 2002, pp. 217-218*

Publications

- Buchmann, B., Maller, R. and Szimayer, A. (2008). An Almost Sure Functional Limit Theorem at Zero for a Class of Levy Processes Normed by the Square Root Function, and Applications. To appear in *Probab. Theory Related Fields.* http://www.springerlink.com/content/l543nu1286811888/
- Buchmann, B. and Chan, N.H. (2007). Asymptotic theory of least squares estimators for nearly unstable processes under strong dependence. *Ann. Statist.* **35** no. 5, 2001-2017.
- Buchmann, B. and Weber, S. (2007). A continuous time approximation of an evolutionary stock price model. *Int. J. Theor. Appl. Finance.* **10**, no. 7, 1229 - 1253.
- Buchmann, B. and Klüppelberg, C. (2006). Fractional integral equations and state space transforms. *Bernoulli* **12**, no. 3, 431–456.
- Buchmann, B. and Klüppelberg, C. (2005). Maxima of stochastic processes driven by fractional Brownian motion. *Adv. in Appl. Probab.* **37**, no. 3, 743–764.
- Buchmann, B. and Klüppelberg, C. (2004). Extremal behaviour of fractal models. *Statistics in Finance workshop, Conference Paper.* Mathematisches Forschungsinstitut Oberwolfach, Germany, 11-17 January.

- Buchmann, B. and Grübel, R. (2004). Decompounding Poisson random sums: recursively truncated estimates in the discrete case. *Ann. Inst. Statist. Math.* **56**, no. 4, 743–756.
- Buchmann, B. and Grübel, R. (2003). Decompounding: an estimation problem for Poisson random sums. *Ann. Statist.* **31**, no. 4, 1054–1074.

Papers in submission

- Buchmann, B. and Chan, N.H. (2008). Integrated Functionals of Fractional and Normal Processes. Monash University and Chinese University of Hongkong. Resubmitted to *Ann. of Appl. Probab.* after second revision.
- Buchmann, B. and Szimayer, A. (2008). Weighted supnorms in the nonparametric inference for Lévy Processes. Monash University and Fraunhofer ITWM. Submitted for publication.