

JONATHAN REUBEN STROUD

Institute of Statistics & Decision Sciences
Box 90251, Duke University
Durham, NC 27708-0251
Birthdate: 9 July 1971
Citizenship: United States

jon@stat.duke.edu
www.stat.duke.edu/~jon
Tel.1: (919) 681-9390
Tel.2: (919) 490-8038
Fax: (919) 684-8594

EDUCATION

Duke University. Ph.D., *Statistics and Decision Sciences*, June 1999.
Dissertation Topic: *Bayesian Analysis of Nonlinear Time-Series Models*.
Advisor: Professor Peter Müller.

Duke University. M.S., *Statistics and Decision Sciences*, May 1996.
Master's Project: *Estimation and Comparison of Multi-Rater Ordinal Data Models*.
Advisor: Professor Valen Johnson.

Boston University. B.A., *Mathematics*. January 1994.

PH.D. THESIS

MCMC Methods for Nonlinear State-Space Models. Developed simulation-based algorithms to perform filtering and smoothing in nonlinear state-space models. Methods rely on dynamic grids and Gaussian mixtures to approximate the posterior distribution.

Spatio-Temporal Modeling. Developed a flexible class of models for spatio-temporal data. A linear state-space framework is used, yielding posterior distributions in closed form.

Credit Risk in Finance. Used simulation-based methods to identify optimal one-time and sequential strategies for collateralizing over-the-counter derivatives transactions.

RESEARCH PROJECTS

Optimal Design in Clinical Trials, with Profs. Peter Müller, ISDS, and Gary Rosner, ISDS and Dept. of Community and Family Medicine, Duke University. Used hierarchical models to determine optimal sampling times for patients receiving the anti-cancer agent Paclitaxel.

Spatio-Temporal Modeling of Ozone Levels, with Dr. Gabriel Huerta, Northwestern University, and Prof. Bruno Sansó, Universidad Simón Bolívar. Exploring temporal trends and spatial variation in Mexico City ozone levels using Bayesian hierarchical models and kriging-based methods.

Gibbs Sampling vs. Importance Sampling for Conditionally Gaussian Models, with Hedibert Lopes, ISDS. Performing empirical study of convergence rates and computational run time for two Monte Carlo methods.

Black-Scholes Volatility Forecasting using Multivariate DLMS, with Prof. Peter Müller and Dr. Andy Pole, Invictus, Inc. Modeling temporal dynamics of the Black-Scholes implied volatility surface over all strike prices and times to expiration.

EXPERIENCE & CONSULTING

DEPARTMENT OF FINANCE, FUQUA SCHOOL OF BUSINESS, DUKE UNIVERSITY

- **Option Pricing with Stochastic Volatility.** Prof. Robert Whaley, January 1997–present. Created a library of 30 C and FORTRAN functions to value options under stochastic volatility and jump-diffusion processes. Prices were calculated using Fourier inversion, finite-difference methods, binomial trees and Monte Carlo simulation. Created wrappers in Visual Basic, allowing the functions to be called from Excel.
- **Binomial Tree Pricing Methods.** Prof. Stephen Gray, October 1996–December 1996. Developed a mechanism for pricing derivatives under no-arbitrage conditions and the Capital Asset Pricing Model (CAPM).

INSTITUTE OF STATISTICS AND DECISION SCIENCES, DUKE UNIVERSITY

- **Health Care Policy.** Prof. Dalene Stangl, June 1996–August 1996. Developed SAS programs to summarize delivery and costs of children’s mental health services in North Carolina.
- **Undergraduate Grade Inflation.** Prof. Valen Johnson, November 1995–May 1996. Examined undergraduate grade inflation using a multi-rater ordinal data model. Computed Bayes’ factors in high dimensions using Laplace approximation.
- **Statistical Consulting.** September 1995–May 1996. Worked as consultant for professors and graduate students in the environmental sciences. Aided with modeling and data analysis.
- **Oceanography.** Prof. Michael Lavine, April 1995–December 1995. Developed space-time Markov random field models to explore water temperature trends in the North Atlantic.

WADSWORTH PUBLISHING COMPANY, Belmont, California

- **Editorial Consulting.** April 1995–July 1995. Proofread exercises and verified solutions for the textbook *Statistics: A Bayesian Perspective*, by Prof. Donald Berry.

CENTER FOR THE STUDY OF SPORT IN SOCIETY, Boston, Massachusetts

- **Sports Sociology.** January 1994–June 1994. Collected and analyzed data for three sports sociology projects; developed educational curriculum for student-athletes in Boston inner-city schools.

MANUSCRIPTS

“**A Closed-Form Approach to Spatio-Temporal Modeling.**” Stroud, J., Müller, P., and Sansó, B. *To be submitted.*

“**Simulation-Based Methods for Choosing Optimal Sampling Times.**” Stroud, J., Müller, P., and Rosner, G. *To be submitted.*

“**Efficient Posterior Simulation for Nonlinear State-Space Models.**” Stroud, J. and Müller, P. *In preparation.*

“**A Capitated, Public-sector, Locally Managed Program for Children’s Mental Health: Changes in Service Delivery and Costs during the First Two Years.**” Stangl, D., Tweed, D., Stroud, J., and Burns, B. *Submitted.*

PRESENTATIONS

- “**A Gaussian Mixture Approach to MCMC Simulation for Nonlinear State-Space Models.**” Presented at the *Workshop on Nonlinear and Nonstationary Signal Processing*, Isaac Newton Institute, Cambridge, England, July 1998.
- “**Spatio-Temporal Modeling with Normal Dynamic Linear Models.**” Presented at the *Sixth Valencia International Meeting on Bayesian Statistics*, Valencia, Spain, June 1998.
- “**Nonlinear State-Space Models: Locally-Weighted Mixtures of NDLMs.**” Presented at the *NSF/NBER Time-Series Seminar*, Duke University, October 1997.
- “**Efficient Posterior Simulation for Nonlinear State-Space Models.**” Presented at the *Readings in Statistical Science Seminar*, Duke University, October 1997.
- “**Bayesian Estimation of Stochastic Volatility Models.**” Presented at the *Graduate Lecture Series on Mathematical Finance*, Duke University, November 1997.

TEACHING

- Teaching Assistant: *Basic Statistics; Statistics & Data Analysis in Economics; Probability & Statistics in Engineering; Applied Regression Analysis*; Fall 1994–Fall 1996, Duke University. Average rating by students: 4.8/5.0.
- Dean’s Commendation for Excellence in Teaching, Spring 1996, Duke University.
- Organizer, *Graduate Lecture Series on Mathematical Finance*, Fall 1997, Duke University.

COMPUTER SKILLS

- C, FORTRAN, Visual Basic, and Pascal.
- UNIX, Windows, and MacIntosh.
- Emacs, L^AT_EX, WordPerfect, Word, and HTML.
- S-Plus, SAS, Mathematica, Maple, and Excel.

REFERENCES

Professor Peter Müller

Institute of Statistics and Decision Sciences
Box 90251, Duke University
Durham, NC 27708-0251

email: pm@stat.duke.edu
phone: (919) 684-3437
fax: (919) 684-8594

Professor Mike West

Institute of Statistics and Decision Sciences
Box 90251, Duke University
Durham, NC 27708-0251

email: mw@stat.duke.edu
phone: (919) 684-8842
fax: (919) 684-8594

Professor David Higdon

Institute of Statistics and Decision Sciences
Box 90251, Duke University
Durham, NC 27708-0251

email: higdon@stat.duke.edu
phone: (919) 684-8443
fax: (919) 684-8594

Professor Robert Whaley

The Fuqua School of Business
Box 90120, Duke University
Durham, NC 27708-0120

email: whaley@mail.duke.edu
phone: (919) 660-7781
fax: (919) 660-7949