

## Jarad B. Niemi

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Statistics & Applied Probability  
UCSB  
Santa Barbara CA 93106-3110  
niemi@pstat.ucsb.edu

Cellular: (651) 485-2798  
Fax: (919) 684-8594

<http://www.stat.duke.edu/~jbn9>

### Education

Ph.D. Statistical Science, Duke University, 2009  
Thesis: Bayesian Analysis and Computational Methods for Dynamic Modeling  
Advisor: Mike West

M.S. Biostatistics, University of Minnesota, 2005  
Thesis: Identifying and evaluating contrarian strategies for NCAA tournament pools  
Advisor: Brad Carlin

B.ChE. Chemical Engineering, University of Minnesota, 1999, Lower Div Honors Program

### Academic Positions

Assistant Professor University of California, Santa Barbara  
2009–current

Researching Bayesian approaches to time series models in the context of applied problems. Teaching applied Bayesian time series, statistical consulting, and probability and statistics. Serving as library liaison and computing committee member.

Research Assistant Duke University  
Mike West 2006–2009

Built statistical models representing the dynamics of protein concentration within individual cells. These models account for the relationships between DNA, RNA, and proteins as well as intrinsic and extrinsic noise and measurement error. Parameter and state estimation on these fine-time scale, non-linear models with scarce observations are accomplished using MCMC and SMC methods for batch and real-time applications, respectively.

Research Assistant University of Minnesota  
Brad Carlin 2004–2005

Assessed optimal strategies for selecting champions in elimination tournaments.

Research Assistant University of Minnesota  
Grace Peng 2003–2004

Wrote SAS, S-Plus, and R programs to analyze AIDS clinical trial and NHANES data. Assessed differences between CPCRA clinical trial participants and the general population in terms of body size measurements and blood chemistries.

### Teaching Experience

Head Teaching Assistant Duke University  
David Banks 2005

STA 101: Data Analysis and Statistical Inference. Organized a team of teaching assistants for quick grading and feedback to a class of over 100 undergraduate students. Taught JMP to undergraduate students in weekly one-hour computer lab sessions.

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Teaching Assistant  
Brad Carlin

University of Minnesota  
2004

PubH 5450: Introduction to Biostatistics I. Taught SAS to graduate students in the school of public health during weekly one-hour computer lab sessions.

Tutor  
Institute of Technology

University of Minnesota  
1996–1997

### Employment

Natural Resources Research Institute  
Consultant

Duluth, MN  
2009–current

Built statistical models to infer the environmental state of an ecosystem given species observations.

Purdue Pharma LP  
Consultant

2007–2008

Built spatial statistical models to analyze drug abuse trends in national databases. Tested various models to determine their power for detecting a change in the trend resulting from a regional or national intervention.

University of Minnesota  
Junior Scientist

Saint Paul, MN  
2001–2004

Designed and analyzed experiments to determine the causes of mutations specific to the *P* element transposon in *Drosophila melanogaster*. Designed and executed mating schemes to create flies with a specific genotype. Conducted polymerase chain reactions to determine presence of certain genes. Microinjected transposable elements into fly embryos to create transformed flies.

Natural Resources Research Institute  
Junior Scientist

Duluth, MN  
2003

Analyzed a multi-year ecological dataset to determine prevalence and abundance of forest birds in national forests located in Minnesota.

Procter & Gamble  
Research Engineer

Cincinnati, OH  
1999–2001

Developed the formulation and process for a highly fortified powdered beverage (NutriStar, currently sold in Nicaragua) aimed at fighting malnutrition in developing countries. Tasks included formulation of a high intensity sweetener version, conducting consumer testing through interviews, focus groups, and tastes tests, and process optimization for a homogenous yet soluble product.

Intern

Summer 1998

Studied the tensile and compression properties of Pringles under various formulations.

Intern

Summer 1997

Evaluated the taste profile of coffee molecules separated via membrane filtration.

### Academic Publications

**Jarad Niemi**, Chiranjit Mukherjee, Hedibert Lopes, and Carlos Carvalho. “Bayesian methods for simultaneous state and fixed parameter estimation using sequential Monte Carlo.” *to be submitted to Bayesian Analysis*

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**Jarad Niemi**, Cheemeng Tan, Lingchong You, and Mike West. “Dynamic nonlinear models for time-lapse fluorescent microscopy.” *to be submitted to Annals of Applied Statistics*

**Jarad B. Niemi** and Mike West. Adaptive mixture modelling Metropolis methods for Bayesian analysis of non-linear state-space models. *submitted to Journal of Computational and Graphical Statistics*

Gerald J. Niemi and **Jarad B. Niemi**. “Old and new applications of multivariate statistics to problems in QSAR.” *submitted to First Indo-US Lecture Series on Discrete Mathematical Chemistry*

Michael D. Porter, **Jarad B. Niemi**, and Brian J. Reich. “Mixture Likelihood Ratio Scan Statistic for Disease Outbreak Detection.” *to appear in Advances in Disease Surveillance*

David Banks, Gauri Datta, Alan Karr, James Lynch, **Jarad Niemi**, and Francisco Vera. “Bayesian CAR Models for Syndromic Surveillance on Multiple Data Streams: Theory and Practice.” *to appear in Information Fusion*

Quanli Wang, **Jarad Niemi**, Cheemeng Tan, Lingchong You, and Mike West. “Image segmentation and dynamic lineage analysis in single-cell fluorescent microscopy.” *to appear in Synthetic Biology*

**Jarad Niemi**, Meredith Smith, and David Banks. (2008), “Test Power for Drug Abuse Surveillance.” in *Biosurveillance and Biosecurity, Proceedings of BioSecure 2008, Lecture Notes in Computer Science*, eds. Daniel Zeng, Hsinchun Chen, Henry Rolka, and William B. Lober. pp. 131–142.

**Jarad Niemi**, Brad Carlin, and Jon Alexander. (2008), “Contrarian strategies for NCAA tournament pools: a cure for March madness?” *Chance* **21**(1): 39–46

Michael J. Simmons, **Jarad B. Niemi**, Don-Felix Ryzek, Cecile Lamour, Joseph W. Goodman, Wojtek Kraszkiewicz, and Ryan Wolff. (2007), “Cytotype Regulation by Telomeric *P* Elements in *Drosophila melanogaster*: Interactions with *P* Elements from M' Strains.” *Genetics* **176**(4): 1957–1966

Cheemeng Tan, Hao Song, **Jarad Niemi**, and Lingchong You. (2007), “A synthetic biology challenge: making cells compute.” *Molecular BioSystems* **3**: 343–353

Kevin J. Haley, Jeremy R. Stuart, John D. Raymond, **Jarad B. Niemi**, and Michael J. Simmons. (2005), “Mutations in the Su(var)2-5 Gene Impair Cytotype-mediated Regulation of *P* Element Activity in *Drosophila melanogaster* through a Maternal Effect.” *Genetics* **171**: 583–595.

**Jarad B. Niemi**, John D. Raymond, Ryan Patrek, and Michael J. Simmons. (2004), “Establishment and Maintenance of the *P* Cytotype Associated With Telomeric *P* Elements in *Drosophila melanogaster*.” *Genetics* **166**: 255–264.

Michael J. Simmons, John D. Raymond, **Jarad B. Niemi**, Jeremy R. Stuart, and Peter J. Merriman. (2004), “The *P* Cytotype in *Drosophila melanogaster*: A Maternally Transmitted Regulatory State of the Germ Line Associated With Telomeric *P* Elements.” *Genetics* **166**: 243–254.

Michael J. Simmons, Kevin J. Haley, Craig D. Grimes, John D. Raymond, and **Jarad B. Niemi**. (2002), “A hobo Transgene That Encodes the P-Element Transposase in *Drosophila melanogaster*: Autoregulation and Cytotype Control of Transposase Activity.” *Genetics* **161**: 195–204.

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Tim W. Dake, **Jarad B. Niemi**, Don L. Hughes, Jeff J. Kester, Don B. Compton, Jon J. Calderas, Rich G. Schafermeyer, Kevin P. Christmas. “Compositions having enhanced aqueous solubility and methods of their preparation.” PCT/US2002/014505

### Presentations

“Adaptive mixture modeling Metropolis methods for state inference in nonlinear time series.” 2009 Joint Statistical Meetings, 3 August (Invited)

“Mixture Likelihood Ratio Scan Statistic for Disease Outbreak Detection.” 7<sup>th</sup> Annual Meeting of the International Society for Disease Surveillance, 3 December 2008 (Contributed)

“Test Power for Drug Abuse Surveillance.” BioSecure, 2 December 2008 (Contributed)

“Assessing the effectiveness of a national drug intervention policy.” Graduate Student Seminar Series, 17 November 2008

“Discrete-time models for intracellular processes in systems biology.” Graduate Student Research Day, Duke University, 02 April 2008

“Bayesian analysis in systems biology: Advances and impact in single-cell dynamical networks.” Graduate Student Seminar Series, 25 February 2008

“Stochastic Modelling and Estimation in Dynamic Cellular Networks.” 39<sup>th</sup> Symposium on the Interface: Computing Science and Statistics, 24 May 2007 (Invited, given on behalf of Mike West)

“Bayesian Modeling and Inference in Single Cell Dynamic Networks.” 39<sup>th</sup> Symposium on the Interface: Computing Science and Statistics, 26 May 2007 (Contributed)

“Identifying and Evaluating Contrarian Strategies for NCAA Tournament Pools.” 2006 Joint Statistical Meetings, 8 August (Contributed)

### Posters

“Nonlinear Dynamic Models for Single-Cell Time-Lapse Microscopy.” Duke Center for Systems Biology Retreat, 18 May 2009

“Adaptive mixture filtering: an alternative to particle filtering?” SAMSI Sequential Monte Carlo Workshop, 8 September 2008.

“Bayesian parameter estimation for systems biological models of dynamic cellular networks.” SAMSI Biosystems Modeling Workshop, 5 March 2007.

“Bayesian parameter estimation for systems biological models of dynamic cellular networks.” 1<sup>st</sup> Annual Duke Systems Biology Symposium, 14 September 2006.

“Bayesian parameter estimation for systems biological models of dynamic cellular networks.” 8<sup>th</sup> Valencia International Meeting on Bayesian Statistics, 5 June 2006.

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### Service

Department of Statistics & Applied Probability Computing Committee, UCSB (2009–current)  
Department of Statistics & Applied Probability Library Liaison, UCSB (2009–current)  
Graduate Consultative Committee, Duke University (2005–2007)  
Student representative on Biostatistics Faculty Committee, University of Minnesota (2003–2005)  
Overall Plan for Advising Students Work Group, University of Minnesota (1997-1999)  
Semester Advising Task Force, University of Minnesota (1997-1999)  
Committee for Semester Conversion Institution, University of Minnesota (1996-1999)  
Semester Conversion Committee, University of Minnesota (1996-1999)  
Business and Rules Committee, University of Minnesota (1996-1997)  
Student Senate Consultative Committee, University of Minnesota (1996-1997)  
Management Team for the Minnesota Student Association, University of Minnesota (1996-1997)  
Institute of Technology Senator, University of Minnesota (1996-1997)

### Honors and Awards

Section on Bayesian Statistical Science Student Paper Competition winner (2009)  
International Society for Disease Surveillance Technical Contest 2<sup>nd</sup> place (2008)  
NSF National Research Service Award Fellowship (2003–2004)  
Undergraduate Research Opportunity Program grant (1997)  
John Tate Memorial Scholarship (1997)  
Presidential Leadership Award (1997)  
Lower Division Honors (1997)  
Whiteside Scholastic Scholarship (1995)  
Phillips Family Scholarship (1995)

### Memberships

American Association for the Advancement of Science  
American Statistical Association  
International Society for Bayesian Analysis