Jarad B. Niemi

Department of Statistics & Statistical Laboratory
Iowa State University
Ames, IA 50011-1210
niemi@iastate.edu

Office: 515.294.8679
Fax: 515.294.4040

http://jarad.me

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

Academic Positions

Assistant Professor	Iowa State University	
Statistics & Statistical Laboratory		2011–present
Assistant Professor	University of California, Santa Barbara	
Statistics & Applied Probability		2009–2011

Employment

Consultant	Boehringer Ingelheim Vetmedica, Inc.	2012
	Natural Resources Research Institute	2009–2010
	Denver Health	2008
	Purdue Pharma LP	2007–2008
Research Assistant	Duke University (Mike West)	2006–2009
	University of Minnesota (Brad Carlin)	2004–2005
	University of Minnesota (Grace Peng)	2003–2004
Junior Scientist	University of Minnesota	2001–2004
	Natural Resources Research Institute	2003
Research Engineer	Procter & Gamble	1999-2001

Publications

* Indicates a student who I am advising or co-advising.

In progress

Matthew Simpson*, **Jarad Niemi**, Vivekananda Roy. "Ancillarity-Sufficiency or not; Interweaving to Improve MCMC Estimation of the Local Level DLM."

Jarad Niemi and Michael Ludkovski. "Tau-leaped particle learning."

Jarad B. Niemi

Submitted Articles

Jonathan Dess, Jennifer L. Momsen, **Jarad Niemi**, Lisa Montplaisir. "Student interpretations of phylogenetic trees in an introductory biology course" *submitted to CBE - Lfe Sciences Education*

Daniel Sheinson*, **Jarad Niemi**, and Wendy Meiring. "Estimation of a disease epidemic using particle filtering." *revision submitted to Journal of Mathematical Biosciences*

Robert B. Gramacy, **Jarad Niemi**, Robin Weiss. "Massively parallel approximate Gaussian process regression." *submitted to SIAM/ASA Journal on Uncertainty Quantification* `http://arxiv.org/abs/1310.5182`

Refereed Journal Articles

Jo Eidsvik, Benjamin A. Shaby, Brian J. Reich, Matthew Wheeler, and **Jarad Niemi**. (2013) "Estimation and prediction in spatial models with block composite likelihoods." *Journal of Computational and Graphical Statistics*

Bernie J Daigle Jr, Min K Roh, Linda R Petzold and **Jarad Niemi**. (2012) "Accelerated maximum likelihood parameter estimation for stochastic biochemical systems." *BMC Bioinformatics* 13:68.

David Banks, Gauri Datta, Alan Karr, James Lynch, **Jarad Niemi**, and Francisco Vera. (2012) "Bayesian CAR models for syndromic surveillance on multiple data streams: theory and practice." *Information Fusion*: 13(2): 105–116.

Mike Ludkovski and **Jarad B. Niemi**. (2010) "Optimal dynamic policies for influenza management." *Statistical Communications in Infectious Diseases*: 2(1): 5.

Jarad B. Niemi and Mike West. (2010), "Adaptive mixture modelling Metropolis methods for Bayesian analysis of non-linear state-space models." *Journal of Computational and Graphical Statistics*. 19(2): 260–280.

Quanli Wang, **Jarad Niemi**, Cheemeng Tan, Lingchong You, and Mike West. (2010), "Image segmentation and dynamic lineage analysis in single-cell fluorescent microscopy." *Cytometry: Part A* **77A**(1): 101–110

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.

Book Chapters

Jarad B. Niemi and Gerald J. Niemi. "Linear regression, model averaging, and Bayesian techniques for predicting chemical activities from structure." Ebook chapter on Advances in Mathematical Chemistry , Editors: Subhash C. Basak, Guillermo Restrepo and Jose Luis Villaveces, Bentham Publishers (*accepted*)

Refereed Conference Proceeding

Michael Ludkovski and **Jarad Niemi** (2011) "Optimal disease outbreak decisions using stochastic simulation." *Proceedings of the 2011 Winter Simulation Conference*, eds. S. Jain, R. R. Creasey, J. Himmelspack, K. P. White, and M. Fu.

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

Refereed Abstracts

Jarad Niemi. (2013) "A Tool for Interactive Disease Outbreak Visualization, Detection, and Forecasting" *Online Journal of Public Health Informatics*

Jarad Niemi and Michael Ludkovski. (2013) "Tau-leaped particle learning." *Online Journal of Public Health Informatics* 5:1 `http://dx.doi.org/10.5210%2Fojphi.v5i1.4575`

Jarad Niemi and Michael Ludkovski. (2011) "Optimal sequential management decisions for measles outbreaks." *Emerging Health Threats Journal* 4 `http://dx.doi.org/10.3402/ehtj.v4i0.11907`.

Jarad Niemi. (2011) "An exploratory analysis of the 2010 measles outbreak in Zimbabwe." *Emerging Health Threats Journal* 4 `http://dx.doi.org/10.3402/ehtj.v4i0.11907`.

Jarad B. Niemi, Michael D. Porter, and Brian J. Reich. (2008), "Mixture likelihood ratio scan statistic for disease outbreak detection." *Advances in Disease Surveillance* 5:49

Book reviews

Jarad B. Niemi. (2010) Dynamic Linear Models with R. *The American Statistician* 64:3, pg 268 http://pubs.amstat.org/doi/abs/10.1198/tast.2010.br643

Other publications

Jarad Niemi and Andrew Gelman. (2011) "Statistical graphics: making information clear – and beautiful. *Significance* 8, 135–137

Jarad B. Niemi. (2010) "Evaluating individual player contributions to team offense and defense: a model based approach." *JSM Proceedings, Section on Statistics in Sports*. Vancouver, BC, Canada: American Statistical Association. 4914–4923.

Jarad B. Niemi and Matthew Wheeler. "Efficient Bayesian inference in stochastic chemical kinetic models using graphical processing units." http://arxiv.org/abs/1101.4242

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 *filed*

Presentations

"Particle learning for low counts in disease outbreaks," Department of Statistics, Iowa State University, 16 September 2013

"Particle learning for sequential estimation and prediction of disease outbreaks" 2013 ICSA-ISBS Joint Statistical Conference, 10 June 2013

"Statistical Methods for Identifying Gene Expression Heterosis" Conference on Applied Statistics in Agriculture, 30 April 2013 (joint with Dan Nettleton)

"Particle learning for low counts in disease outbreaks" Midwest Statistics Research Colloquium, 15 Mar 2013 (invited)

"A computational approach to the sequential control problem" Duke Department of Statistical Science 25^{th} Anniversary Celebration, 20 Oct 2012 (invited)

"Rejection sampling on a graphical processing unit" 11th World Meeting of the International Society for Bayesian Analysis, 28 June 2012 (invited)

"Determining optimal sequential disease outbreak interventions" University of Iowa, Computational Epidemiology Seminar, 20 Jan 2012 (invited)

"Optimal sequential management decisions for measles outbreaks" International Society for Disease Surveillance 10^{th} Annual Conference, 7 Dec 2011 (contributed)

"A sequential Monte Carlo primer" Iowa State University, Department of Statistics, Computational Statistics working group, 12 Oct 2011 (invited)

"Statistical computing on graphical processing units" Iowa State University, Department of Statistics, Computational Statistics working group, 28 Sep 2011 (invited)

"Time management." UCSB IGERT Career Development Seminar Series, 12 April 2011 (invited)

"Optimal dynamic policies for influenza management." Iowa State University departmental seminar, 24 February 2011 (invited)

"Optimal sequential management decisions for influenza outbreaks." University of California, Santa Barbara Statistics and Applied Probability departmental seminar, 12 January 2011 (invited, joint with Mike Ludkovski)

"Optimal sequential management decisions for influenza outbreaks." International Society for Disease Surveillance 9^{th} Annual Conference, 2 Dec 2010 (contributed)

"Evaluating individual player contributions in basketball." Joint Statistical Meetings, 4 Aug 2010 (contributed)

"A brief introduction to R." University of California, Santa Barbara Quantitative Methods in Social Sciences seminar, 8 April 2010 (invited)

"Early outbreak detection using syndromic surveillance networks." University of California, Los Angeles Biostatistics departmental seminar, 19 November 2009 (invited)

"A sequential Monte Carlo primer." University of California, Santa Barbara Statistics and Applied Probability departmental seminar, 21 October 2009 (invited)

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

"Computational methods for general state-space models." University of New Mexico Mathematics and Statistics departmental seminar, 19 February 2009 (invited)

"Computational methods for general state-space models." University of Michigan Statistics departmental seminar, 17 February 2009 (invited)

"Computational methods for general state-space models." University of Texas, Austin Information, Risk, and Operations Management departmental seminar, 17 February 2009 (invited)

"Computational methods for general state-space models." Johns Hopkins Biostatistics departmental seminar, 6 February 2009 (invited)

"Computational methods for general state-space models." University of California, Los Angeles Biostatistics departmental seminar, 28 January 2009 (invited)

"Computational methods for general state-space models." Iowa State Statistics departmental seminar, 26 January 2009 (invited)

"Computational approaches for general state-space models." University of California, Santa Barbara Statistics and Applied Probability departmental seminar, 12 January 2009 (invited)

"Mixture likelihood ratio scan statistic for disease outbreak detection." 7$^{\text{th}}$ 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 (contributed)

"Discrete-time models for intracellular processes in systems biology." Graduate Student Research Day, Duke University, 02 April 2008 (contributed)

"Bayesian analysis in systems biology: Advances and impact in single-cell dynamical networks." Graduate Student Seminar Series, 25 February 2008 (contributed)

"Stochastic modelling and estimation in dynamic cellular networks." 39$^{\text{th}}$ 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$^{\text{th}}$ 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

"A Tool for Interactive Disease Outbreak Visualization, Detection, and Forecasting" International Society for Disease Surveillance 12$^{\text{th}}$ Annual Conference, 7 Dec 2011 (contributed)

"An exploratory analysis of the 2010 measles outbreak in Zimbabwe" International Society for Disease Surveillance 10$^{\text{th}}$ Annual Conference, 7 Dec 2011 (contributed)

"Parameter inference in stochastic chemical kinetic models on GPUs." MCMSki3: 4$^{\text{th}}$ International IMS/ISBA Joint Meeting, 6 Jan 2011

"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 Kickoff 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$^{\text{st}}$ Annual Duke Systems Biology Symposium, 14 September 2006.

"Bayesian parameter estimation for systems biological models of dynamic cellular networks." 8$^{\text{th}}$Valencia International Meeting on Bayesian Statistics, 5 June 2006.

Jarad B. Niemi

Collaborative posters and presentations

MacDonald, A.L., L.A. Schulte Moore, M.J. Helmers, and **J.B. Niemi**. 2012. Bird response to native habitat strips integrated into agricultural fields. Presented August 29 at the International Conference on Agricultural Biodiversity and Sustainability, Hokkaido University, Japan.

A.L. MacDonald, L.A. Schulte, M.J. Helmers, and **J.B. Niemi**. 2012. Testing a new conservation practice for agricultural landscapes: Bird response to prairie strips in row-cropped landscapes. Presented on August 7th at the 97th Annual Meeting of the Ecological Society of America, Portland, Oregon.

News interviews (hyperlinked)

CNBC, CBS Moneywatch, MSN MoneyCentral, Slate (2009, 2011, 2012, 2013), The Chronicle

Courses taught

Regular courses

Fall 2013	401A	Statistical Methods for Research Workers
	615	Advanced Bayesian Methods
Spring 2013	544	Bayesian Statistics
Fall 2012	401A	Statistical Methods for Research Workers
	HON 321E	Paradox
Spring 2012	401A	Statistical Methods for Research Workers
Fall 2011	615	Advanced Bayesian Methods
Spring 2011	120C	Probability and Statistics (categorical, nonparametrics, and Bayesian)
	230	Seminars and Projects in Statistical Consulting
Winter 2011	220B	Advanced Statistical Methods (GLMs)
Fall 2010	120B	Probability and Statistics
Spring 2010	120B	Probability and Statistics (estimation and testing)
	230	Seminar and Projects in Statistical Consulting
Winter 2010	262	Applied Bayesian Time Series

Independent studies

Spring	596	Parallelizing block composite likelihoods
Winter 2011	596	Bayesian inference in stochastic chemical kinetic models
	596	Bayesian inference in ecological models
	510	Preparation for applied statistics qualifying exam
Fall 2010	596	Bayesian inference in graphical processing units
Spring 2010	596	Importance sampling on graphical models

Short courses

Apr 2010	Sequential Monte Carlo methods	ASA-Albuquerque	$\frac{1}{2}$-day
Dec 2009	Introduction to statistical analysis in R	NRRI	2-day

Jarad B. Niemi

Grants, Honors, and Awards

Nettleton, D. Liu, P., Niemi, J., Schnable. P. Hierarchical Modeling and Parallelized Bayesian Inference for the Analysis of RNAseq Data, National Institutes of Health, September 1, 2013 to May 31, 2017 [$ 1,088,156] (2013)

Iowa State University Health Research Initiative on Infectious Diseases (investigator) [$150,000] (2012)

World Meeting of the International Society for Bayesian Analysis Early Career Researchers Travel Grant [$500] (2012)

Iowa State University grant for GPU cluster and RA support [$88,000] (2011)

University of California Regents Junior Faculty Fellowship [$7,500] (2011)

MCMSki3 conference travel support [$650] (2011)

NVIDIA Academic Partnership Program award [2×C2050 GPGPUs] (2010)

Section on Bayesian Statistical Science Student Paper Competition winner [$1,000] (2009)

International Society for Disease Surveillance Technical Contest 2nd place (2008)

NSF National Research Service Award Fellowship (2003–2004)

Memberships

American Association for the Advancement of Science

American Statistical Association

International Society for Bayesian Analysis

International Society for Disease Surveillance

Service

Refereeing

- Journal of Computational and Graphical Statistics (2014), Technometrics (2013), Electronic Journal of Statistics (2013), Journal of the American Statistical Association (2012), Journal of Quantitative Analysis in Sports (2012) , Statistics and Computing (2012) , Journal of Agricultural, Biological, and Environmental Statistics (2012 x 2) , Current Computer-Aided Drug Design (2012) , IEEE Trans. on Systems, Man, and Cybernetics–Part C: Applications and Reviews (2011) , Journal of Agricultural, Biological, and Environmental Statistics (2011) , Applied Stochastic Models in Business and Industry (2011) , Annals of Applied Statistics (2011×2) , Computational Statistics & Data Analysis (2010) , Electronic Journal of Statistics (2010) , International Society for Disease Surveillance conference (2010–2013) , Journal of Statistical Education (2009)

Conference organization

- International Society for Disease Surveillance Analytical Methods track chair (2012,2013)
- International Society for Disease Surveillance session chair (2010)
- Joint Statistical Meetings, Section on Statistical Computing session chair (2009)

Other statistical community service (hyperlinked if appropriate)

- ISBA Web Editor (2013-present)
- News Editor for Significance Magazine (2010–2012)
- Professional blog (`http://jarad.me/archive.html`) (2009–present)
- Professional twitter account (`@NiemiSTAT`)

- Boy Scouts of America troop presentation on estimating player abilities in basketball

University service

- Iowa State University Faculty Senate departmental representative (2012–present)
- UCSB faculty legislature, member (2010–2011)
- Center for research in financial mathematics and statistics, UCSB, member (2010–2011)
- Quantitative methods in the social sciences, UCSB, core faculty (2009–2011)

Departmental service

- Iowa State University Department of Statistics & Statistical Laboratory
  * Preparing Future Faculty mentor for Will Landau (2013–2014)
  * Advisory Committee to the Chair (2013–present)
  * Department Chair search committee (2012–present)
  * Computational Statistics working group, chair (2011–present)
  * STAT-ers advisor (2011–present)
  * Computation advisory committee, member (2011–present)
  * Social committee, member (2011–present)
  * Graduate student committees, see Table below
- UCSB Department of Statistics & Applied Probability
  * Graduate student committees, see Table below
  * Applied statistics qualifying exam committee, UCSB (2010–2011)
  * Computing committee, UCSB (2009–2011)
  * Library liaison, UCSB (2009–2011)

Student	School	Department	Degree	Completed	Chair
Danny Sheinson	UCSB	PSTAT	PhD	In progress	Co-chair
Chi-Yang Chiu	UCSB	PSTAT	MS	2011	
Danny Sheinson	UCSB	PSTAT	MS	2011	Co-chair
Andreea Erciulescu	ISU	STAT	PhD	In progress	
David Osthus	ISU	STAT	PhD	In progress	
Kenneth Wakeland	ISU	STAT	PhD	In progress	
Vianey Leos	ISU	STAT	PhD	In progress	
Matthew Simpson	ISU	STAT	PhD	In progress	Chair
Anwen Yin	ISU	ECON	PhD	In progress	
Tyler Streeter	ISU	E CPE	PhD	In progress	
Hao Cheng	ISU	AN S	PhD	In progress	
Jian Zeng	ISU	AN S	PhD	In progress	
Andrea Kaplan	ISU	STAT	MS	In progress	
Samuel Benidt	ISU	STAT	MS	In progress	
Ignacio Alvarez	ISU	STAT	MS	In progress	Chair
Adam Martin-Schwarze	ISU	STAT	MS	In progress	Chair
Rayma Cooley	ISU	NREM	MS	In progress	
Rebecca Reeves	ISU	NREM	MS	In progress	
Minliang Yang	ISU	A B E	MS	In progress	
Yihui Xie	ISU	STAT	PhD	2013	
Caitlyn Abell	ISU	AN S	PhD	2013	
Andrew Lithio	ISU	STAT	MS	2013	
Carson Sievert	ISU	STAT	MS	2013	
Eddie Shea	ISU	NREM	MS	2013	
Casey Oliver	ISU	STAT	MS	2012	Co-chair
Nicholas Michaud	ISU	STAT	MS	2012	
Rachel Fahrenholtz	ISU	STAT	MS	2012	
Anna MacDonald	ISU	NREM	MS	2012	

Table 1: Graduate student committees