

# PATRICK BREHENY

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## EDUCATION

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2006-2009	University of Iowa Ph.D., Biostatistics. <i>Received July 2009.</i>	Iowa City, IA
2004-2006	University of Iowa M.S., Biostatistics. <i>Received May 2006.</i>	Iowa City, IA
2002-2004	Iowa State University M.S., Biochemistry. <i>Received August 2004.</i>	Ames, IA
1998-2002	Iowa State University B.S., Mathematics, with honors. <i>Received May 2002.</i> B.S., Physics, with honors. <i>Received May 2002.</i>	Ames, IA

## RESEARCH INTERESTS

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- Methods for analyzing high-dimensional data
- Methods and algorithms for penalized likelihood models
- Computational statistics
- Analysis of genomic data and bioinformatics

## EMPLOYMENT

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2009-Present	University of Kentucky Assistant professor, Departments of Statistics and Biostatistics	Lexington, KY
2005-2006	Center for Public Health Statistics, University of Iowa Research assistant	Iowa City, IA

## PEER-REVIEWED PUBLICATIONS

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- FARDO, D. W., DRUEN, A. R., LIU, J., MIREA, L., INFANTE-RIVARD, C. and BREHENY, P. (to appear). An exploration and comparison of methods for combining population- and family-based genetic association using the genetic analysis workshop 17 mini-exome. *BMC Proceedings*.
- BREHENY, P. and HUANG, J. (2011). Coordinate descent algorithms for nonconvex penalized regression, with applications to biological feature selection. *Ann. Appl. Stat.*, **5** 232–253.

- GODE-POTRATZ, C., KUSTUSCH, R., BREHENY, P., WEISS, D. and MCCARTER, L. (2011). Surface sensing in vibrio parahaemolyticus triggers a programme of gene expression that promotes colonization and virulence. *Mol. Microbiol.*, **79** 240–263.
- BREHENY, P. and HUANG, J. (2009). Penalized methods for bi-level variable selection. *Stat. Interf.*, **2** 369–380.
- OLESON, J., BREHENY, P., PENDERGAST, J., RYAN, S. and LITCHFIELD, R. (2008). Impact of travel distance on wisewoman intervention attendance for a rural population. *Prev. Med.*, **47** 565–569.
- GFELLER, K., OLESON, J., KNUTSON, J., BREHENY, P., DRISCOLL, V. and OLSZEWSKI, C. (2008). Multivariate predictors of music perception and appraisal by adult cochlear implant users. *J. Am. Acad. Audiol.*, **19** 120.
- BREHENY, P., LAEDERACH, A., FULTON, D. and ANDREOTTI, A. (2003). Ligand specificity modulated by prolyl imide bond cis/trans isomerization in the itk sh2 domain: a quantitative nmr study. *J. Am. Chem. Soc.*, **125** 15706–15707.

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#### MANUSCRIPTS IN SUBMISSION

- HUANG, J., BREHENY, P., MA, S. and ZHANG, C.-H. (In submission). The mnet method for variable selection.
- BREHENY, P., CHALISE, P., BATZLER, A., WANG, L. and FRIDLEY, B. L. (In submission). Genetic association studies of copy-number variation: should assignment of copy number states precede testing?
- HUANG, J., BREHENY, P. and MA, S. (In submission). A selective review of group selection in high dimensional models.
- PODZIELINSKI, I., DESIMONE, C. P., VAN NAGELL, J. R., ESCOBAR, P. F., COHN, D. E., QUICK, A. M., ALVAREZ SECORD, A., HAVRILESKY, L. J., CHINO, J. P., LOPEZ, M., STEHMAN, F. B., SEITZ, J. L., ZOOK, J. E., RANDALL, M. E., BREHENY, P. J. and SEAMON, L. G. (In submission). Primary radiation therapy for medically inoperable patients with clinical stage I and II endometrial carcinoma.
- NICKELL, M. D., BREHENY, P., STROMBERG, A. J. and MCCLINTOCK, T. S. (In submission). Genomics of immature olfactory sensory neurons.
- SRINIVASAN, J., BREHENY, P. J., KELLY, R. P. and STUNKARD, A. J. (In submission). Meditation for quality improvement of medical encounters: Single-intervention, vedanta-based meditation effects on vital signs and mood indices.

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#### PH.D. DISSERTATION

- Breheny, P. “Regularized methods for high-dimensional and bi-level variable selection”. Dissertation advisor: Professor Jian Huang. Defended May 2009.

OTHER PUBLICATIONS

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- Breheny, P (2011). Review of *Intuitive Biostatistics: A Nonmathematical Guide to Statistical Thinking*, by H. Motulsky. *The American Statistician*, 65: 67-68.
- *2005 Iowa Health Fact Book*, University of Iowa College of Public Health and the Iowa Department of Public Health.

SOFTWARE

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- `grpreg`, an R package for computing regularized paths for regression models with grouped covariates (<http://cran.r-project.org/web/packages/grpreg/index.html>)
- `ncvreg`, an R package for fitting MCP- and SCAD-penalized regression models (<http://cran.r-project.org/web/packages/ncvreg/index.html>)

PRESENTATIONS

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- Group exponential penalties for bi-level variable selection. Joint Statistical Meetings. Miami, Florida. July 2011.
- Genetic association studies of copy-number variation: should assignment of copy number states precede testing? Poster. International Genetic Epidemiology Society Meetings. Boston, MA. October 2010.
- The MNet estimator. Joint Statistical Meetings. Vancouver, British Columbia. August 2010.
- Coordinate descent algorithms for nonconvex optimization. ENAR Spring Meeting. New Orleans, LA. March 2010.
- Coordinate descent algorithms for nonconvex penalized regression methods. Joint Statistical Meetings. Washington, D.C. August 2009.
- Statistical graphics and visualization using R and `GGobi`. Biostatistics Student Organization Seminar. Iowa City, IA. March 2009.
- A short guide to SAS macros. Iowa SAS Users Group. Iowa City, IA. February 2009.
- Bilevel feature selection with applications to genetic association studies. **Invited speaker**. Fall Conference on Statistics in Biology. Ames, IA. October 2008.
- A general framework for bi-level variable selection. Joint Statistical Meetings. Denver, CO. August 2008.
- Impact of travel distance on WISEWOMAN intervention attendance. Poster. University of Iowa Research Week. Iowa City, IA. April 2008.
- Extending regression models using penalized approaches. Biostatistics Student Organization Seminar. Iowa City, IA. November 2007.

TEACHING

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University of Kentucky	Instructor Applied Statistical Modeling for Medicine and Public Health (BST 764) Readings in Statistics: Penalized Regression (STA 715) Advanced Regression (BST 760) Nonparametric Statistics (STA 621) Biostatistics I (STA 580)
University of Iowa	Instructor Introduction to Biostatistics (171:161)
University of Iowa	Guest Lecturer Biostatistical Computing (171:178) Biostatistical Methods II (171:202) Theory of Biostatistics II (171:252)
University of Iowa	Teaching Assistant Introduction to Biostatistics (171:161)
Iowa State University	Teaching Assistant Survey of Biochemistry (BBMB 301)
Iowa State University	Supplemental Instructor Calculus II (Math 166)

ADVISING

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- Currently directing one Ph.D. thesis in the statistics department
- Currently directing one MPH capstone.
- Committee member for two completed MPH capstones.
- Currently serving on three doctoral committees.
- Currently serving on two MPH capstone committees.

FUNDING (ACTIVE)

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- Co-investigator (10%, 10/2010-). National Center for Research Resources grant 2-P20-RR020145-07, “Center for the Biologic Basis of Oral/Systemic Diseases”. Principal investigator: Dr. Jeffrey Ebersole. \$2,207,122, 9/2004-7/2014.
- Co-investigator (5%, 9/2010-). National Institute of Child Health and Human Development grant 1-R21-HD059058-01-A2, “Farm to School: A Community-Based Program to Combat Childhood Obesity”. Principal investigator: Dr. Mark Swanson. \$174,761, 9/2010-8/2011.
- Internal (10%, 12/2010-). Dan and Virginia Martin Pediatric Research Fund, in association with the University of Kentucky Department of Pediatrics.

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 FUNDING (COMPLETED)
 

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- Fellow (8/2006-7/2009): National Institute of General Medical Sciences grant 5-T32-GM077973, “Statistics in microbiology, infectious diseases, and bioinformatics”. Principal investigator: Dr. Kathryn Chaloner.

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 PROFESSIONAL SERVICE
 

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- Review Editor, *Frontiers in Bioinformatics and Computational Biology*
- Referee, *Biometrics*
- Referee, *IEEE Transactions on Parallel and Distributed Systems*
- Referee, *Genetic Epidemiology*
- Referee, *The Journal of the American Statistical Association*
- Referee, *The Journal of Bayesian Analysis*
- Session chair, Joint Statistical Meetings, 2009-2011
- Session chair, ENAR Spring Meeting, 2010
- Member, American Statistical Association, 2006-.
- Member, Institute of Mathematical Statistics, 2005-.

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 UNIVERSITY SERVICE
 

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- Discussion moderator, University of Kentucky Health Care Common Reading Experience, 2011.
- Academic Affairs Committee, University of Kentucky College of Public Health, 2011-.
- Practice and Service Committee, University of Kentucky College of Public Health, 2009-2011.
- Degree program committee, Ph.D. in Epidemiology and Biostatistics, University of Kentucky, 2010-.
- Ph.D. qualifying exam committee, Department of Statistics, University of Kentucky, 2010-.
- Ph.D. qualifying exam committee, Department of Biostatistics, University of Kentucky, 2010-.
- Ph.D. qualifying exam committee, Center for Biomedical Engineering, University of Kentucky, 2010
- Picnic committee, Department of Statistics, University of Kentucky, 2009-2010
- Minutes committee, Department of Statistics, University of Kentucky 2009-2010

- Faculty judge, Graduate Student Interdisciplinary Conference, University of Kentucky, *April 2010*.
- President, Biostatistics Student Organization, University of Iowa, *2006-2007*.

#### HONORS AND AWARDS

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- Milford E. Barnes Award (for outstanding graduate student in Biostatistics), University of Iowa, *2009*.
- Elected to Delta Omega (Public Health Honorary Society), *2009*.
- Graduate teaching award, Iowa State University, *2003*.

Last updated: August 17, 2011