

PATRICK BREHENY

Multidisciplinary Science Building
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EDUCATION

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

- Methods for analyzing high-dimensional data
- Methods and algorithms for penalized likelihood models
- Computational statistics
- Analysis of genomic and genetic data
- Statistical graphics and visualization

EMPLOYMENT

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

PEER-REVIEWED PUBLICATIONS

- HUANG, J., BREHENY, P. and MA, S. (to appear). A selective review of group selection in high dimensional models. *Statistical Science*.

- SMITH, K. L., LI, Y., BREHENY, P., HENNEY, P. J., SELLS, S., PRONOST, S., LU, Z., CROSSLEY, B. M., COOK, R. F. and BALASURIYA, U. B. R. (to appear). Development and validation of a new allelic discrimination real-time PCR assay for the detection of equine herpesvirus-1 (EHV-1) and identification of A_{2254} and G_{2254} strains in clinical specimens. *Journal of Clinical Microbiology*.
- NICKELL, M. D., BREHENY, P., STROMBERG, A. J. and MCCLINTOCK, T. S. (to appear). Genomics of immature olfactory sensory neurons. *Journal of Comparative Neurology*.
- BREHENY, P., CHALISE, P., BATZLER, A., WANG, L. and FRIDLEY, B. L. (2012). Genetic association studies of copy-number variation: Should assignment of copy number states precede testing? *PLoS ONE*, **7** e34262.
- SRINIVASAN, J. and BREHENY, P. J. (2012). Meditation for quality improvement of medical encounters: Single-intervention, vedanta-based meditation effects on vital signs and mood indices. *Journal of Evidence-Based Complementary & Alternative Medicine*, **17** 96–103.
- PODZIELINSKI, I., RANDALL, M. E., BREHENY, P. J., ESCOBAR, P. F., COHN, D. E., QUICK, A. M., CHINO, J. P., LOPEZ-ACEVEDO, M., SEITZ, J. L., ZOOK, J. E. and SEAMON, L. G. (2012). Primary radiation therapy for medically inoperable patients with clinical stage I and II endometrial carcinoma. *Gynecologic Oncology*, **124** 36 – 41.
- FARDO, D., DRUEN, A., LIU, J., MIREA, L., INFANTE-RIVARD, C. and BREHENY, P. (2011). Exploration and comparison of methods for combining population- and family-based genetic association using the genetic analysis workshop 17 mini-exome. *BMC Proceedings*, **5** S28.
- BREHENY, P. and HUANG, J. (2011). Coordinate descent algorithms for nonconvex penalized regression, with applications to biological feature selection. *Annals of Applied Statistics*, **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. *Molecular Microbiology*, **79** 240–263.
- BREHENY, P. and HUANG, J. (2009). Penalized methods for bi-level variable selection. *Statistics and Its Interface*, **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. *Preventive Medicine*, **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. *Journal of the American Academy of Audiology*, **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. *Journal of the American Chemical Society*, **125** 15706–15707.

MANUSCRIPTS IN SUBMISSION

- HUANG, J., BREHENY, P., MA, S. and ZHANG, C.-H. (In submission). The mnet method for variable selection.

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

- 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

- `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

- 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.

CLINICAL ABSTRACTS

- “Clinical Parameters to Predict Extubation Outcome In the Pediatric Intensive Care Unit”, James Laham, Patrick Breheny. American Academy of Pediatrics National Conference. New Orleans, LA. October 2012.
- “Impact of Physician Staffing on Pediatric Sedation Complication Rates”, Cheri Landers, Philip Bernard, Dawn Turner, Patrick Breheny, Scottie Day, James Laham. Society for Pediatric Sedation Conference. Cleveland, OH. May 2012.
- “Extubations in the PICU: A pilot study”, James Laham. American Academy of Pediatrics National Conference. Boston, MA. October 2011.
- “A Pilot Study: Preoperative Assessment of Second Hand Smoking Exposure in Children-How Much Can We Trust the Provided History?”, Eric Ashford, Anna Young, Arundathi Reddy, Destiny Chau. American Society of Anesthesiologists Annual Meeting. Chicago, IL. October 2011.
- “Effect of Second-Hand Smoking on PONV in Children Undergoing Tonsillectomies: A Pilot Study”, Anna Young, Arundathi Reddy, Eric Ashford, Destiny Chau. American Society of Anesthesiologists Annual Meeting. Chicago, IL. October 2011.

TEACHING

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

- Currently serving as doctoral dissertation advisor for one student in the statistics department: Yinglei Li
- Advisor for one completed MPH capstone: Zhenyu Huang.
- Committee member for two completed MPH capstones.
- Currently serving on four doctoral committees.
- Currently serving on one DrPH capstone committee.

MASTER'S PROJECTS DIRECTED

- “Statistical analysis of metabolite concentrations in heart tissue from four groups of mouse models in response to Adriamycin treatment,” Zhenyu Huang, College of Public Health, University of Kentucky.

FUNDING (ACTIVE)

- Consultant (2.5%, 08/2012-08/2013). Merck IISP ID 40305, “A study to compare the impact of a school based HPV program on vaccination uptake and completion rates.” Principal investigator: Dr. Christine Weyman. 08/2012-08/2013.
- 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 (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.

FUNDING (COMPLETED)

- 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.

PROFESSIONAL SERVICE

- Review Editor, *Frontiers in Bioinformatics and Computational Biology*
- Reviewer, *The American Statistician*
- Reviewer, *OMICS: A Journal of Integrative Biology*
- Reviewer, *Statistical Science*
- Reviewer, *Biometrics*
- Reviewer, *IEEE Transactions on Parallel and Distributed Systems*
- Reviewer, *Genetic Epidemiology*
- Reviewer, *The Journal of the American Statistical Association*
- Reviewer, *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-.

UNIVERSITY SERVICE

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

- 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: May 1, 2012