

John W. Emerson
“Jay”

Curriculum Vitae

Contact Information

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Academic Appointments

- Associate Professor, Department of Statistics, Yale University, 2009-present; Faculty Affiliate, Yale Center for Environmental Law and Policy; Guest Professor, Peking University.
- Assistant Professor, Department of Statistics, Yale University, 2003-2009.
- Lecturer, Department of Statistics, Yale University, Spring 2003.
- Graduate Instructor, Yale University at Pfizer, Spring 2001.
- Graduate Instructor, Department of Statistics, Yale University, Summers 1996, 1997, 1999.

Other Employment

- Statistical consulting, FBI and the U.S. Department of Justice, District of Connecticut, 2002-present.
- Advisor/Consultant, REvolution Computing (2007-2009).
- Consultant, Pfizer, Inc. (2006-2009)
- Expert witness, the Employment Law Group, 2005-2006.
- Statistical consulting for Lansberg Gersick & Associates, LLC, 2005.
- Systems Administrator, Department of Geology and Geophysics, Yale University. 1999-2003.
- Marketing Research Consultant, CBS Network Television. 1996-1998.

Education

- **Yale University**, New Haven, CT. 1994-2002. Ph.D. in Statistics.
Dissertation: Asymptotic Admissibility and Bayesian Estimation.
Advisor: John Hartigan, Eugene Higgins Professor of Statistics.
- **Oxford University**, Exeter College, Oxford, England. 1992-1994. M.Phil. in Economics.
Topics of Study: Micro and Macroeconomic Theory, Industrial Organization, and Econometrics.
Thesis: Finite-Sample Properties of Sample Selection Estimators: Principles and a Case Study.
- **Williams College**, Williamstown, MA. 1988-1992. B.A. Economics and Math, Honors in Math.
Honors: Magna Cum Laude, Phi Beta Kappa, Sigma Xi, Class of 1960 Scholar in Economics.
Thesis: Bayesian Categorical Data with Multivariate Qualitative Measurements.

Academic Honors and Awards; Professional Memberships

- John M. Chambers Statistical Software Award, 2010; with Michael Kane.
- Fellow, Connecticut Academy of Arts and Sciences.
- Member, Institute of Mathematical Statistics.
- Member, American Statistical Association.
- Winner, 1998 Student Paper Competition of the ASA Section on Statistical Graphics.
- Dissertation Fellowship, Yale University, 1998-1999.
- Graduate Fellowship, Yale University, 1994-1998.
- Stirling Fellowship, Yale University, 1994-1996.
- Donovan and Moody Fellowships for graduate study at Exeter College, Oxford, 1992-1994.
- Magna Cum Laude, with Honors in Mathematics, Williams College.
- Class of 1960 Scholar in Economics, Williams College.
- Phi Beta Kappa and Sigma Xi.

Ph.D. Students

- Chandra Erdman (graduated May 2009)
- Michael Kane (graduated December 2010)

Selected recent publications:

- Emerson, John W., Daniel C. Esty, Tanja Srebotnak, and Diana Connett (2011). "Exploring Trade & the Environment: An Empirical Examination of Trade Openness and National Environmental Performance." New Haven: Yale Center for Environmental Law and Policy (forthcoming).
- Emerson, John W. and Silas Meredith (2011). "Nationalistic Judging Bias in the 2000 Olympic Diving Competition." *Math Horizons*, to appear.
- Crimin, Kimberly S., John W. Emerson, and Robb J. Muirhead (2010). "Reference regions for beat-to-beat ECG data." *Pharmaceutical Statistics* DOI: 10.1002/pst.444.
- Emerson, John W., D.C. Esty, M.A. Levy, C.H. Kim, V. Mara, A. de Sherbinin, and T. Srebotnjak (2010). *2010 Environmental Performance Index*. New Haven: Yale Center for Environmental Law and Policy.
- Emerson, John W., Miki Seltzer, and David Lin (2009). "Assessing Judging Bias: an Example from the 2000 Olympic Games." *The American Statistician* 63(2): 124-131.
- Emerson, John W., Marisa Dolled-Filhart, Lyndsay Harris, David L. Rimm, and David P. Tuck (2009). "Quantitative Assessment of Tissue Biomarkers and Construction of a Model to Predict Outcome in Breast Cancer Using Multiple Imputation." *Cancer Informatics* 2009:7, 29-40.
- Erdman, Chandra and John W. Emerson (2008). "A fast Bayesian change point analysis for the segmentation of microarray data." *Bioinformatics* 24(19) 2143-2148; doi: 10.1093/bioinformatics/btn404.
- Erdman, Chandra, and John W. Emerson (2007). "bcp: A Bayesian Analysis for Change Point Problems Using R." *Journal of Statistical Software* 23(3).
- Emerson, John W. (2007). "Chance, On and Off the Ice." *Chance* 20(2).
- Levin, Hillel Y. and John W. Emerson (2006). "Biases in the Jury Selection Process: A Study in Connecticut." *Connecticut Law Review* 38(3), 325-353.

Other publications:

- Klein, A., Evan Beach, John W. Emerson, and Julie Zimmerman (2010). "Accelerated solvent extraction of lignin from *Aleurites moluccana* (candlenut) nutshells." *Journal of Agricultural and Food Chemistry* 58 (18), 10045-10048, DOI 10.1021/jf1019856.
- Simpson, Andrew K., J. Sabino, P. Whang, John W. Emerson, and Jonathan Grauer (2009). "The Assessment of Cervical Foramina with Oblique Radiographs: the Effect of Film Angle on Foraminal Area." *Journal of Spinal Disorders and Techniques* 22(1), 21-25.
- Bruscia, Emanuela M., Ping-Xia Zhang, Elisa Ferreira, Christina Caputo, John W. Emerson, David Tuck, Diane Krause, and Marie Egan (2008). "Microphages directly contribute to the exaggerated inflammatory response in Cfrt +/- mice." *American Journal of Respiratory Cell and Molecular Biology* 40, 295-304.
- Emerson, John W. (2008). "Review of Interactive and Dynamic Graphics for Data Analysis." *Biometrics*, 64 (4), 1301-1302.
- Goldstein, Robin, Johan Almenbert, Anna Dreber, John W. Emerson, Alexis herschkowitsch, and Jacob Katz (2008). "Do More Expensive Wines Taste Better? Evidence from a Large Sample of Blind Tastings." *Journal of Wine Economics*, 3(1), 2008.

- George, Mathew K., John W. Emerson, Sameer A. Cheema, Robert McGlynn, Bryce Ford, James F. Martone, Milton Bruce Shields, and Martin Wand (2008). "Evaluation of a modified protocol for Selective Laser Trabeculoplasty." *Journal of Glaucoma* 17(3), 197-202.
- Bible, Jesse E., Andrew K. Simpson, John W. Emerson, Debdut Biswas, and Jonathan N. Grauer (2008). "Quantifying the Effects of Age, Gender, Degeneration, and Adjacent Level Degeneration on Cervical Spine Range of Motion Using Multivariate Analyses." *Spine* 33(2), 1793-1799.
- Arya, Adarsh V., John W. Emerson, Michael Engelbert, Curtis Hagedorn, and Ron A. Adelman (2006). "Surgical management of Pseudophakic Retinal Detachments." *Ophthalmology* 113(10), 1724-1733.
- George, Mathew K, Thomas Kuriakose, Brian M. DeBroff and John W. Emerson (2006). "The effect of Gonioscopy on keratometry and corneal surface topography." *BMC Ophthalmology* 6:26; doi:10.1186/1471-2415-6-26.
- Bertagnoli, Rudolf, James J. Yue, Trace Kershaw, Rahul V. Shah, Frank Pfeiffer, Andrea Fenk-Mayer, Regina Nanieva, Amin Karg, Daniel Husted, and John W. Emerson (2006). "Lumbar total disc arthroplasty utilizing the ProDisc prosthesis in smokers versus nonsmokers: a prospective study with 2-year minimum follow-up." *Spine* 31(9), 992-997.
- Bertagnoli, Rudolf, James J. Yue, Regina Nanieva, Andrea Fenk-Mayer, Daniel Husted, Rahul V. Shah, and John W. Emerson (2006). "Lumbar total disc arthroplasty in patients older than 60 years of age: a prospective study of the ProDisc prosthesis with 2-year minimum follow-up period." *Journal of Neurosurgery: Spine* 4(2).
- Bertagnoli, Rudolf, James J. Yue, Andrea Fenk-Mayer, Jonathan Eerulkar, and John W. Emerson (2006). "Treatment of symptomatic adjacent-segment degeneration after lumbar fusion with total disc arthroplasty by using the prodisc prosthesis: a prospective study with 2-year minimum follow up." *Journal of Neurosurgery: Spine* 4(2).
- Emerson, John W. and Walton Green (2006). "The Spark Mat: a graphical method of exploring spatially distributed time series." JASA poster competition, 2006.
- Shachar, Ron and John W. Emerson (2000). "Cast Demographics, Unobserved Segments, and Heterogeneous Switching Costs in a TV Viewing Choice Model." *Journal of Marketing Research* 37(2), 173-186.
- Emerson, John W. (1998). "Mosaic Displays in S-PLUS: A General Implementation and a Case Study." *Statistical Computing and Graphics Newsletter* 9(1), 17-23.
- "Mosaic Displays in S-PLUS." Winner, 1998 Student Paper Competition of the ASA Section on Statistical Graphics.

Work in the pipeline:

- "Scalable Strategies for Computing with Massive Data." Michael J. Kane, John W. Emerson, and Steve Weston, in submission, *Journal of Computational and Graphical Statistics*.
- "Statistical Sleuthing by Leveraging Human Nature: A Study of Olympic Figure Skating." John W. Emerson and Taylor B. Arnold, in submission, *The American Statistician*.
- "Goodness-of-Fit Tests for Discontinuous Distributions." Taylor B. Arnold and John W. Emerson, in submission, *The R Journal*.

- “Towards Molecular Design Guidelines for Reduced Acute Aquatic Toxicity of the Fathead Minnow (*Pimephales promelas*).” Voutchkova, A. M., Emerson, J. W., Osimitz, T., Zimmerman, J. B., and Anastas, P. T., in submission.
- “Evaluation of steady-state visual evoked potentials in diabetic retinopathy.” Mathew George, George Hu, John W. Emerson, Veena Rao, Ron Adelman, James Tsai, and John Huang, in submission.
- “A Comprehensive Rehabilitation Protocol for Lumbar Disc Replacement: The Straubing Rehabilitation Index.” With James Yue *et.al.* in submission.
- “Cone-beam reconstruction for the 2-circles plus line trajectory.” Yanbin Lu, Jiansheng Yang, John W. Emerson, Heng Mao, Yuanzheng Si, and Ming Jiang, in preparation.
- “The generalized pairs plot.” John W. Emerson, Walton A. Green, Barret Schloerke, Di Cook, Heike Hofmann, and Hadley Wickham, in preparation.
- “Minimalist Sufficient Statistics.” In preparation.
- “Distance-based ANOVA with functional magnetic resonance imaging.” With Zarrar Shehzad, in preparation.
- “Multivariate Bayesian Change Point Analysis.” With Chandra Erdman, work in progress.
- “Limitations of Genome-wide association studies: Lessons Learned from the Framingham Project.” With Stephen Stearns and Susan Wang, work in progress.

Committees and Service

- Associate Editor, *Journal of Statistical Software* (2010-present).
- Secretary/Treasurer Elect, American Statistical Association Section on Statistical Graphics (2010).
- MCDB 900 Guest Lecture: Statistics and Statistics at Yale (2010).
- Quantitative Reasoning Committee (2008-present).
- Bates Fellowship Committee (2007-present).
- Jonathan Edwards Senior Essay Awards Committee (2007-2008).
- Secretary of the Fellows, Jonathan Edwards College (2007-present).
- Quan 199 Guest Lecture Module: Quantitative Methods across the Disciplines (2007).
- Department of Statistics Director of Graduate Studies (2006-07).
- Department of Statistics Computer Committee, Chair (2003-09).
- Department of Statistics Statistical Clinic Coordinator (2003-present).
- Yale University Teaching & Learning Committee, Member (2005-2007).
- Yale University Teaching & Learning Portal Advisory Committee, Member (2005-2007).
- Library Hiring Committee, Social Science Data Librarian, Member (2005-2006).
- Department of Statistics Hiring Committee, Member. 2004-2006.
- Department of Statistics Library Coordinator. 2003-2006.
- Bioinformatics Admissions Committee, Member. 2003-2005.
- Reviewer, *Theoretical Biology and Medical Modeling*.
- Reviewer, *Bioinformatics*.
- Reviewer, *The R Journal*.
- Reviewer, *The American Statistician*.

- Reviewer, *Journal of Industrial Ecology*.
- Reviewer, *Computational Statistics*.
- Reviewer, *International Journal of Biostatistics*.
- Reviewer, *Journal of Marketing*.
- Boardmember, Yale Co-op. 1995-1999.
- Graduate Coordinator, Hall of Graduate Studies, Yale University. 1998-1999.
- Dean's Committees, Yale Graduate School. 1995-1997. McDougal Committee (designing the new Graduate Student Center); Kutzinski Committee (reviewing the Teaching Fellow Program).

Teaching

- Summers 2007 and 2009: "An Intensive Course in Data Analysis with Statistical Case Studies," Peking University.
- Quan 199 Guest Lecture Module: Quantitative Methods across the Disciplines.
- MCDB 900 Guest Lecture: Statistics and Statistics at Yale.
- Stat 662, Statistical Computing (new course, 2008)
- Stat 661, Advanced Data Analysis
- Stat 627, Statistical Consulting (new course, 2003)
- Stat 626, Practical Work
- Stat 625, Case Studies
- Stat 242/542, Theory of Statistics
- Stat 230/530, Introductory Data Analysis
- Stat 128, Real-World Statistics (new course, 2009)
- Stat 100, Introductory Statistics

Conferences and Presentations

- Invited Session (organizer), Joint Statistical Meetings, Miami, FL 2011: "The Future of Statistical Computing Environments."
- Topic Contributed Session (organizer and speaker), Joint Statistical Meetings, Miami, FL 2011: "Statistical Analyses of Judging in Athletic Competitions."
- Invited Speaker, Statistical Methods for Very Large Data Sets Conference, Baltimore, MD, June 2011.
- Invited Speaker, American Association for the Advancement of Science, Washington, DC, February 2011.
- Expert review panel presentation, Yale Center for Environmental Law and Policy, Washington, DC, November 2010.
- Chicago R-Meetup presentation, October 2010.
- Seminar series, Yale Center for Analytical Sciences, October 2010.
- Multiple seminar/workshop series, UNICAMP, Campinas, Brazil, September 2010.
- Multiple seminar/workshop series, IME-USP, Sao Paulo, Brazil, September 2010.

- Invited Seminar, IM-UFRJ, Rio do Janeiro, Brazil, September 2010.
- Invited Seminar, Boston University, September 2010.
- Invited Seminar, Census Bureau, Washington, DC, July 2010.
- UseR! Topic Contributed presentation, Washington, D.C., July 2010.
- Interface 2010 Topic Contributed presentation, Seattle, June 2010.
- New York City R-Meetup presentation, June 2010, available online at <http://www.vcasmo.com/video/drewconway/8555>.
- Invited Neyman Seminar, University of California, Berkeley, April 2010.
- Invited Seminar, Choate Rosemary Hall, April 2010.
- Invited Seminar, Bristol-Myers Squibb, April 2010.
- Department Seminar, Yale University, March 2010.
- Invited Seminar, Middlebury College, March 2010.
- New York City R-Meetup presentation, March 2010.
- Announcement of the 2010 Environmental Performance Index (press conference), World Economic Forum, Davos, Switzerland, January 2010.
- “60 Years: Antony Unwin. Mathematisches Festkolloquium.” Augsburg, Germany, January 2010.
- Department Seminar, Biostatistics, Yale University, September 2009.
- UseR! Focus Session, Rennes, France, July 2009.
- Rmetrics Workshop speaker, Meielisalp, Switzerland, July 2009.
- Chinese Environmental Performance Index Workshop, Hong Kong, June 2009.
- Invited Seminar, Department of Statistics and Mathematics, Vienna University of Economics and Business Administration, Vienna, Austria, June 2009.
- Invited Seminar, New York City chapter of the ASA, May, 2009.
- Workshop, “R and Statistics.” West Point, New York, May 2009.
- Workshop, “What’s the Fuss about R?” New York City, April, May, November 2009.
- Invited seminar, Iowa State University, December 2008.
- JSM 2008 Topic Contributed Session; organizer and presenter, Denver, CO, August 2008.
- UseR! Focus Session, Dortmund, Germany, August 2008.
- Workshop, Pfizer. Groton, CT, July 2008.
- Invited Seminar, Boston University, May 2008.
- Workshop, Novartis. Boston, MA, May 2008.
- Invited Seminar, Universität Augsburg, Germany, April 2008.
- Invited Seminar, Colby College, April 2008.
- Invited Seminar, Middlebury College, 2007 and 2005.
- Guest Lecture Module, QUAN 199a: Quantitative methods across the Disciplines (for Charles Bailyn and Doug Kankel), Fall 2007.
- JSM Invited Panel, Salt Lake City, Utah, 2007. Chaired a session.
- JSM Poster: The Sparkmat: A Graphics Method of Exploring Spatially Distributed Time Series. Seattle, WA, 2006.
- Invited Lecture, Pfizer. Groton, CT, 2006.
- Keynote speaker, Annual Meeting of the Connecticut Independent Teachers Association. Greenwich, CT, 2006.
- UseR! Presentation: Sparkmats and Generalized Pairs Plots. Vienna, Austria (2006).

- JSM Minneapolis, MN (2005).
- JSM Toronto, Canada (2004).
- Invited Seminar, Williams College (1999).
- JSM Winner, Student Paper Competition, Dallas, TX (1998).

Statistical Software:

- R package **bcp** (available on CRAN): Bayesian change point analysis.
- R package **YaleToolkit** (available on CRAN): a collection of tools for exploratory data analysis.
- The Bigmemory Project (<http://www.bigmemory.org/>): a family of R packages (**bigalgebra** and **bigvideo** available on R-Forge, others available on CRAN):
 - **bigmemory**
 - **biganalytics**
 - **bigtabulate**
 - **synchronicity**
 - **bigalgebra**
 - **bigvideo**
- R package **QTTQ** (used internally at Pfizer for cardiac studies).
- R packages **ks.test** and **cvm.test** (available on R-Forge).
- R packages **niftir** and **neurocor** (available on request) for fMRI processing and analysis.

Patent Application:

- Cone-beam Computed Tomography on a Multimodal Imaging System. With Ming Jiang et.al, Peking University.

Grants:

- Federal Express R09621, “Trade and Environmental Linkage Study,” principal investigator (\$250,000, 2010-2011).

In Popular Media

- *Wall Street Journal* (10/25/2010). “In Medicaid’s Data Trove, Clues to Curing Cost Crisis.” Contributor to methodology and analysis.
- *Newsday.com* (2/22/2010). “Statistics say skating judges still don’t have it right.” Quoted.
- *The Statesman* (1/28/2010). “The 2010 Environmental Performance Index.” Quoted.
- *Wall Street Journal* (6/20/2008). “World’s Greatest Athlete: How we did it.” Contributor to methodology and analysis.
- *Wall Street Journal* (4/24/2008). “Ford’s Googol Googol Console Options.” Citation.
- *Wall Street Journal* (3/31/2007). “Reservations at Top Restaurants.” Produced the graphics.
- Emerson, John W. (2006). “Stat prof assesses the Game day data.” *Yale Daily News Yale-Harvard Issue*, November 17.
- *Wall Street Journal* (3/18/2006). “The Perfect Payday.” Collaborated with eventual Pulitzer Prize winning authors Charles Forelle and James Bandler on the methodology (and implemented the R code for the analysis) leading to the infamous stock option backdating scandal.
- *Wall Street Journal* (3/23/2006). “Picking the Perfect NCAA Bracket.” Citation.
- *ABC World News Tonight* (2/17/2006). “John Berman on the new scoring system in skating.” Interviewed, following my analysis of a problem with the new scoring system leading up to the Winter Olympics.
- *Wall Street Journal* (2/15/2006). “Does the New Way of Judging Skating Actually Add Up?” Author Charles Forelle wrote the first piece on my analysis. Subsequent coverage appeared in the *Scientific American* and many online news outlets.
- Emerson, John W. “On the Court, In the Office: A Game of Statistics.” *Hartford Courant*, March 17, 2005.