Ryan T. Elmore

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Degrees

Ph.D. in Statistics, The Pennsylvania State University, August 2003

M.S. in Statistics, Miami University, August 1998

B.S. in Mathematics, Morehead State University, December 1995

Experience

September 2015 – Present	Assistant Professor, Department of Business Information and Analytics Daniels College of Business, University of Denver
May 2010 – June 2015	Senior Scientist National Renewable Energy Lab
November 2011 – August 2015	Faculty Affiliate, Department of Statistics Colorado State University
June 2008 – March 2010	Analytics Researcher Slide, Inc.
August 2009 – December 2009	Distance Course Coordinator, Department of Statistics Colorado State University
August 2005 – June 2008	Assistant Professor, Department of Statistics Colorado State University
October 2003 – April 2005	Postdoctoral Research Associate, Mathematical Sciences Institute The Australian National University
August 1998 – August 2003	Teaching/Research Assistant, Department of Statistics The Pennsylvania State University
May 1999 – August 1999	Internship in Statistics Minitab, Inc.
August 1996 – August 1998	Teaching Assistant, Department of Mathematics and Statistics Miami University
May 1997(8) – August 1997(8)	Internship in Statistics National Institute for Occupational Safety and Health
May 1996 – August 1996	Internship in Statistics Institute for Defense Analyses
January 1996 – April 1996	Internship in Statistics Oak Ridge National Laboratory

Publications

Elmore, R. (2015). A review of *Analytic Methods in Sports: Using Mathematics and Statistics to Understand Data from Baseball, Football, Basketball, and Other Sports*. *The American Statistician*, **69**, 244. http://dx.doi.org/10.1080/00031305.2015.1068616

Inman, D., Elmore, R., and Bush, B. (2015). A case study to examine the imputation of missing data to improve clustering analysis of building electrical demand. *Building Services Engineering Research and Technology*, **36**, 628 – 637. http://dx.doi.org/10.1177/0143624415573215

Davidson, C., Drury, E., Lopez, A., Elmore, R.T., Margolis, R. (2014). Modeling photovoltaic diffusion: an analysis of geospatial datasets. *Environmental Research Letters*, **9**. https://doi.org/10.1088/1748-9326/9/7/074009

Elmore, R.T., Hettmansperger, T.P., and Xuan, F. (2006). On Spherical Depth and a Multivariate Median, *in* R. Y. Liu, R. Serfling, and D. L. Souvaine (eds) *Data Depth: Robust Multivariate Analysis, Computational Geometry, and Applications*, DIMACS Series in Discrete Mathematics and Theoretical Computer Science, **72**, pp. 87–101. http://goo.gl/d5GAvK

Elmore, R.T., Hettmansperger, T.P., and Xuan, F. (2006). A fully nonparametric test for one-way layouts. *Australian and New Zealand Journal of Statistics*, **48**, 477 – 490. http://dx.doi.org/10.1111/j.1467-842X.2006.00452.x

Elmore, R.T., Hall, P., and Troynikov, V.S. (2006). Nonparametric density estimation from covariate information. *Journal of the American Statistical Association*, **101**, 701 – 711. http://dx.doi.org/10.1198/016214505000000916

Hall, P., Neeman, A., Pakyari, R., and Elmore, R.T. (2005). Nonparametric inference in multivariate mixtures. *Biometrika*, **92**, 667 – 678. http://dx.doi.org/10.1093/biomet/asm042

Elmore, R.T., Hall, P., and Neeman, A. (2005). An application of classical invariant theory to identifiability in nonparametric mixtures. *Annales de l'Institut Fourier* (Grenoble), **55**, 1 – 28. http://dx.doi.org/10.5802/aif.2087

Elmore, R.T., Hettmansperger, T.P., and Xuan, F. (2004). The sign statistic, one-way layouts, and mixture models. *Statistical Science*, **19**, 579 – 587. http://projecteuclid.org/euclid.ss/1113832722

Elmore, R.T., Hettmansperger, T.P., and Thomas, H. (2004). Estimating component cumulative distribution functions in finite mixture models. *Communications in Statistics – Theory and Methods*, **33**, 1–12. http://dx.doi.org/10.1081/STA-200026574

Bailer, A.J., Elmore, R.T., Shumate, B.J., and Oris, J.T. (2000). Simulation study of characterisitics of statistical estimators of inhibition concentration. *Environmental Toxicology and Chemistry*, **19**, 3068–3073. http://dx.doi.org/10.1002/etc.5620191229

Technical Reports and Proceedings

Gagnon, P., Margolis, R., Melius, J., Phillips, C., and Elmore, R. (2016). Rooftop Solar Photovoltaic Technical Potential in the United States: A Detailed Assessment. NREL Report No. TP-6A20-65298.

Elmore, R., Gruchalla, K., Phillips, C., Purkayastha, A., and Wunder, N. (2016) An Analysis of Application Power and Schedule Composition in a High Performance Computing Environment. NREL Report No. TP-2C00-65392.

Getman, D., Bush, B., Elmore, R., and Inman, D. (2015). Evaluation of Methods for Comparison of Spatiotemporal and Time Series Datasets. NREL Report No. TP-6A20-62647.

Laros III, J.H., Kelly, S.M., Hammond, S., Elmore, R. and Munch, K. (2014). Power/Energy use case project document. Sandia National Laboratories Technical Report SAND2013-10789.

Campanelli, M., Emery, K., Elmore, R., Zaharatos, B. (2014). Uncertainty Analysis for Maximum Power at SRC Using Hierarchical Monte Carlo Simulation. *Proceedings of the 40th IEEE Photovoltaic Specialists Conference*.

Jones, W., Elmore, R., Lee, J., and Kennedy, C. (2011). Step-Stress Accelerated Degradation Testing for Solar Reflectors: Preprint. 10 pp.; NREL Report No. CP-2C00-52624.

Lee, J., Elmore, R., and Jones, W. (2011). Statistical Modeling of Photovoltaic Reliability Using Accelerated Degradation Techniques (Poster). 1 pg.; NREL Report No. PO-2C00-50738.

Lee, J., Elmore, R., Kennedy, C., Gray, M., and Jones, W. (2011). Lifetime Prediction for Degradation of Solar Mirrors using Step-Stress Accelerated Testing (Presentation). NREL (National Renewable Energy Laboratory). 22 pp.; NREL Report No. PR-2C00-52658.

Lee, J., Elmore, R., Suh, C., and Jones, W. (2010). Step-Stress Accelerated Degradation Testing (SSADT) for Photovoltaic (PV) Devices and Cells (Presentation). 15 pp.; NREL Report No. PR-2C00-49487

Elmore, R. T. and Wang, S. (2003). Identifiability and estimation in multinomial mixture models. *Technical Report #03-04*, Department of Statistics, Penn State University.

Hettmansperger, T.P. and Elmore, R.T. (2002). Tests for interaction in a two-way layout: Should they be included in a nonparametrics course? *Proceedings of the Sixth International Conference on Teaching Statistics.*

arXiv Papers

Scharf, H., Elmore, R., and Gruchalla, K. (2014). Prioritized data compression using wavelets. Under review at *Statistical Analysis and Data Mining.* arXiv:1407.2954

Biagioni, D.J., Elmore, R., and Jones, W. (2012). Keeping greed good: sparse regression under design uncertainty with applications to biomass characterization. Revising for submission. arXiv:1207.1888

R Packages

Ballr: An R API for basketball-reference.com (author)

RDSTK: An R wrapper for the data science toolkit API. (author)

mixtools: Tools for analyzing finite mixture models (contributor)

Invited Presentations

"Topics in Power-Aware High Performance Computing" Presented at the University of Denver, Department of Computer Science, October 2015.

"Predicting Who Will Make the NBA Playoffs" Presented at the University of Denver, Department of Business Information and Analytics, January 2015.

"R and Web Scraping" Presented at Analyze Boulder Meetup, November 2013.

"The Future of Programming: Data" Presented at the Davinci Institute, Boulder, CO, September 2013.

"Missing Observations in Time Series Data with Applications to Building Systems Monitors" Presented at Colorado State University, October 2012.

"Computational Sciences Center at NREL" Presented at MIT Energy Initiative, May 2013.

"Data Analysis @ NREL" Presented at the Department of Energy Conference on Data Analysis in Santa Fe, NM, February 2012.

"Mining MLB (Sports) Data" Presented at the August 2011 meeting of the Rocky Mountain Chapter of the Society for American Baseball Research (SABR).

"The Life of a Computational Statistician at the National Renewable Energy Lab" Presented at the Colorado State University and Brigham Young University in October 2010 and February 2011, respectively.

"The Two Sample Problem and Robust Multivariate Methods" Presented at the University of Chicago Department of Statistics on January 8, 2010.

"Robust multivariate statistics and data depth" Presented at Colorado College on November 2, 2007 and University of Wyoming on March 7, 2008.

"Statistical inference based on elliptical depth" Presented at conference on Current and Future Trends in Nonparametrics, Columbia, South Carolina, October 12, 2007.

"Nonparametric estimation of functionals using covariate information" Presented at University of Sydney, Australia on May 21, 2007.

"Nonparametric density estimation from covariate information" Presented at the following universities' Department of Statistics colloquium series (2006): Kansas State University (Oct 12), Texas A&M (Oct 19), and the University of Georgia (Nov 9).

"A multivariate test for location based on elliptical depth" Presented at the International Conference on Robust Statistics, Jyväskylä, Finland, June 2005.

"An affine-invariant data depth based on random hyperellipses" Presented at: (1) Workshop on Nonparametric Statistical Methods hosted by the University of Tampere, Finland, June 2005, and (2) Statistics Seminar, The Australian National University, May 2005.

"Elliptical data depth: theoretical properties and applications" Presented at University of Sydney, March 2005.

"A fully nonparametric test for one-way layouts" Presented at the following universities' Department of Statistics colloquium series: Colorado State University, North Carolina State University, University of Florida, University of South Carolina, University of British Columbia, February 2005.

"A fully nonparametric test for one-way layouts" Presented at Statistical Society of Australia, Inc – South Australia Branch, November 2004.

"The sign statistic, one-way layouts, and mixture models" Presented at Miami University, September 2003.

Presentations

Denver R Users Group, Denver, CO:

1. "Using R to Predict an NBA Team's Probability of Making the Playoffs", January 2014
2. "Programming with Big Data in R (pbdR)", September 2013
3. "The .RProfile File", December 2011
4. "R and the Data Science ToolKit (RDSTK)", May 2011
5. "Using R to Analyze Freely Available Sports Data", October 2010 (Inaugural Meeting)

Colorado-Wyoming Chapter of the American Statistical Association Fall Meeting, November 2012 "Energy Efficient High Performance Computing".

useR! The 8th International R User Conference, Nashville, TN, June 2012 (lightning talk) "Using R for Scraping Data".

Joint Statistical Meetings, Seattle, WA, August 2006, "Nonparametric density estimation from covariate information." (Note: I was invited to speak in a Topic Contributed session on function estimation.)

The Seventh IMS North American New Researchers Conference, Toronto, Canada, August 2004 "Spherical data depth and an application to multivariate medians".

Applied Statistics Seminar, The Australian National University, July 2004, "Spherical data depth and its applications".

International Biometric Conference / Australian Statistical Conference, Cairns, Australia, July 2004, "The sign statistic and one-way layouts."

Applied Statistics Seminar, The Australian National University, May 2004, "Sign statistics and one-way layouts."

Joint Statistical Meetings, New York, NY, August 2002. "A semiparametric approach to analyzing repeated measures from a finite mixture model."

Workshop on Developments and Challenges in Mixture Models, Bump Hunting and Measurement Error Models, Cleveland, OH, June 2002. "Estimating finite mixture cumulative distribution functions using multinomial mixtures."

Joint Statistical Meetings, Atlanta, GA, August 2001. "An almost nonparametric approach to estimation in the multivariate, finite mixture model."

International Conference on Robust Statistics, Vorau, Austria, July 2001. "Almost nonparametric inference for repeated measures in finite mixture models in the presence of intrasubject correlation."

External Funding

NSF – DMS grant proposal (2006) "Problems in classical and contemporary nonparametric statistical methods." Total budget: $197,104 (not funded)

NSF – DMS grant proposal (2005) "Nonparametric topics in finite mixture models and one-way layouts." Total budget: $188,670 (not funded)

DOD – National Security Agency (2007) "11th North American Meeting of New Researchers in Statistics and Probability." Total budget: $10,000 (funded)

DOD – Office of Naval Research (2008) "11th North American Meeting of New Researchers in Statistics and Probability." Total budget: $8,000 (funded)

NREL Funding

Contributor on Laboratory Directed Research and Development (LDRD) grant proposal "Computational Steering and Modeling using the ESIF Insight Center". Funded for 24 months in FY15 and FY16.

Contributor on LDRD grant proposal"A Framework for Comparison of Spatiotemporal and Time Series Datasets". Funded for 24 months in FY14 and FY15.

PI on LDRD grant proposal "Integrated Energy Management and Analysis for the ESIF's Computational Systems". Funded for 21 months in FY13 and FY14.

Contributor on LDRD grant proposal "Novel Visualization and Analysis for Extreme-Scale Wind Turbine Array Simulations". Funded for 24 months in FY13 and FY14.

Co-PI on LDRD grant proposal "Automated Analysis of Renewable Energy Datasets". Funded for 18 months in FY12 and FY13.

Contributor on LDRD grant proposal "Towards Building Design Optimization under Uncertainty". Funded for 24 months in FY12 and FY13.

Advising and Committee Membership

Travis J. Atkinson	M.S. in Statistics, Summer 2006 (advisor)
Dustin White	M.S. in Statistics, Summer 2007 (advisor)
Amy Kagey	M.S. in Statistics, Summer 2008 (advisor)
Sarah Williams	M.S. in Statistics, Fall 2006 (committee member)
Megan D. Higgs	Ph.D. in Statistics, Summer 2007 (committee member)
Todd Iverson	Ph.D. in Statistics, Summer 2008 (committee member)

Professional Societies

American Statistical Association

Teaching Experience

Fall 1996	Precalculus (Miami U.)
Spring 1997(8), Fall 1997	Introduction to Statistics (Miami U.)
Fall 1998(9), Spring 1999	Elementary Statistics (Recitation sections at PSU)
Summer 1999	Elementary Statistics (PSU)
Spring 2000(1), Summer 2000	Probability (PSU)
Fall 2000	Experimental Methods I (PSU)
Fall 2001	Computing Environments (PSU)
Fall 2002	Introduction to Biostatistics (PSU)
Spring 2004	Probability, Mathematical Statistics and Stochastic Processes (ANU)
Fall 2005 & 2006	Data Analysis and Regression – ST 540 (CSU)
Fall 2005 & 2006	Statistical Science – ST 501 (CSU)
Spring 2006 & Fall 2007	Nonparametric Statistics – ST 570 (CSU)
Spring 2006	Multiple Regression Analysis – ST 304 (CSU)
Spring 2007 & 2008	Multivariate Analysis – ST 460/560 (CSU)
Fall 2007	Advanced Theory of Statistics I – ST 730 (CSU)

Professional Service

Co-founded the Denver R Users Group – October 2010
Co-organizer for conference on Nonparametric Statistics and Mixture Models – May 2008
Co-organizer for IMS New Researchers Conference in Boulder (NCAR/CU) – July 2008
Conference organizing committee for IMS New Researchers Conference in Salt Lake City – July 2007
Secretary for CO/WY Chapter of the ASA
Founded the Student Organized Activities and Research Seminars (SOARS) at CSU
Co-organizer of CSU colloquium series (August 2005 – August 2007)
Member of undergraduate committee (August 2006 – June 2008)
Reviewed book proposal for CRC Press
Associate Editor for *Journal of Quantitative Analysis in Sports*
Referee for *Journal of Quantitative Analysis in Sports*
Referee for *Journal of the American Statistical Association*
Referee for *Annals of Statistics*
Referee for *Journal of Multivariate Analysis*
Referee for *JRSS Series B*
Referee for *Computational Statistics and Data Analysis* (2)
Referee for *Child Development*
Referee for *Communications in Statistics*
Co-organizer of Mathematical Sciences Institute (at ANU) colloquium series

Computing Skills

Operating Systems: Linux, Macintosh OS X, Unix, Windows/DOS
Programming Languages: R, S-plus, Python, SQL, NoSQL, LaTeX
High Performance Computing: MPI, PBD-R

Honors and Awards

2002	PSU Department of Statistics Research Fellowship
2002	Student award from Workshop on Developments and Challenges in Mixture Models, Bump Hunting and Measurement Error Models
2002	Summer Travel Grant, PSU Department of Statistics
2001	Nominated for The PSU Graduate School's Graduate Assistant Award for Outstanding Teaching
2001	Summer Travel Grant, PSU Department of Statistics
1998	Graduate Scholars Award, PSU Graduate School
1998	Statistical Journal Award, MU Department of Mathematics and Statistics
1996	Science and Engineering Research Sememster, US Department of Energy
1995-6	Thomas E. Fouch Mathematics Award, MSU Department of Mathematical Sciences
1995-6	Outstanding Graduate in Mathematics, MSU Department of Mathematical Sciences
1995-6	Outstanding Undergraduate Student in Mathematical Sciences, MSU Department of Mathematical Sciences
1994-5	Outstanding Statistics Student, MSU Department of Mathematical Sciences

Hobbies

Hiking, backpacking, ultimate frisbee, soccer, rock climbing, yoga, computing and data analysis

References

Available upon request