Daniel J. Eck

Curriculum Vitae

1Illini Hall
725 South Wright Street
Champaign, IL 61820
✉ dje13@illinois.edu
🖝 https://publish.illinois.edu/danieleck/

Experience

2019– **Assistant Professor**, *Department of Statistics, University of Illinois at Urbana-Champaign*.

2017–2019 **Postdoctoral Associate**, *Biostatistics, Yale University*.
Mentor: Forrest W. Crawford

Education

2013–2017 **Ph.D. in Statistics**, *University of Minnesota*.
Advisors: Charles J. Geyer and R. Dennis Cook

2009 **BS in Mathematics**, *Southern Illinois University at Carbondale*, Magna Cum Laude honors.

Research Interests

maximum likelihood estimation, exponential family theory, generalized linear models, envelope methodology, conformal prediction, causal inference, model averaging, bootstrap techniques, infectious disease epidemiology, life history analysis in ecology, design of experiments, physics applications, and baseball

Submitted/Working Papers

Eck, D. J. and Geyer, C. J. (2020+). Computationally efficient likelihood inference in exponential families when the maximum likelihood estimator does not exist. *Submitted*. *Preprint at* `https://arxiv.org/abs/1803.11240`.

Eck, D. J., Morozova, O., and Crawford, F. W. (2020+). Randomization for infectious disease interventions in clustered study populations. *Submitted*. *Preprint at* `https://arxiv.org/abs/1808.05593`.

Eck, D. J. and Crawford, F. W. (2020+). Conformal prediction for exponential families and generalized linear models. *Submitted*. *Preprint at* `https://arxiv.org/abs/1905.03657`.

Publications

8. Cheng, S., **Eck, D. J.**, and Crawford, F. W. (2019+). Estimating the size of a hidden finite set: large-sample behavior of estimators. *Statistics Surveys*. **14**, 1–31.

7. **Eck, D. J.**, Geyer, C. J., and Cook, R. D. (2019+). Combining envelope methodology and aster models for variance reduction in life history analyses. *Statistical Planning and Inference*, **205**, 283–292.

6. **Eck, D. J.**, Nachtsheim, C., Cook, R. D., and Albrecht, T. (2019). Dimensional analysis in multivariate design of experiments. *Published online at Technometrics*. *See* `https://www.tandfonline.com/doi/full/10.1080/00401706.2019.1585294`.

5. **Eck, D. J.** (2018). Bootstrapping for multivariate linear regression models. *Statistics and Probability Letters*, **134**, 141–149.

4. Kohler, R. J., Arnold, S. A., **Eck, D. J.**, and Pluhar, E. (2018). Short-term complications and risk factors in dogs undergoing craniotomy for intracranial neoplasia: 160 cases (2009-2015). *Journal of the American Veterinary Medical Association*, **253**, 12, 1594–1603.

3. **Eck, D. J.** and Cook, R. D. (2017). Weighted envelope estimation to handle volatility in model selection. *Biometrika*, **104**, 743–749.

2. **Eck, D. J.** and McKeague, I. W. (2016). Central limit theorems under additive deformations. *Statistics and Probability Letters*, **118**, 156–162.

1. **Eck, D. J.**, Shaw, R. G., Geyer, C. J., and Kingsolver, J. (2015). An integrated analysis of phenotypic selection on insect body size and development time. *Evolution*, **69**, 2525–2532.

In preparation

Eck, D. J. Model-free weighted envelope estimation.

Morozova, O., **Eck, D. J.**, and Crawford, F. W. Regression and stratification for contagious outcomes.

Technical Reports

Eck, D. J. (2019). Technical report for "Conformal prediction for exponential families and generalized linear models." `https://github.com/DEck13/conformal.glm/blob/master/techreport/techreport-conformal.pdf`

Eck, D. J., Shaw, R. G., Geyer, C. J., and Kingsolver, J. G. (2015). Supporting Data Analysis for "An Integrated Analysis of Phenotypic Selection on Insect Body Size and Development Time." Technical Report No. 698. School of Statistics, University of Minnesota. `http://conservancy.umn.edu/handle/11299/172272`

Eck, D. J. (2015). Supporting Data Analysis for "An Application of Envelope Methodology and Aster Models." Technical Report No. 699. School of Statistics, University of Minnesota. `http:`

//conservancy.umn.edu/handle/11299/178384

Software

Eck, D. J. (2018). R package **conformal.glm** (Conformal Prediction for Generalized Linear Regression Models). Current version 0.2. `https://github.com/DEck13/conformal.glm`

Geyer, C. J. and **Eck, D. J.** (2016). R package **glmdr** (Exponential Family Generalized Linear Models Done Right). Current version 0.1. `https://github.com/cjgeyer/glmdr`

Eck, D. J. (2016). R package **envlpaster** (envelope estimators of aster model parameters). Current version 0.1-2. `https://cran.r-project.org/web/packages/envlpaster/index.html`

Fun Projects

Eck, D. J. (2019+). Challenging nostalgia and performance metrics in baseball. *Accepted at CHANCE. Preprint at* `https://arxiv.org/abs/1810.08029`.

Teaching and Appointments

University of Illinois

Classroom teaching
Instructor for STAT 385 *Statistical Programming Methods*, Fall 2019.

University of Minnesota

Classroom teaching
Instructor for STAT 3011 *Introduction to Statistics*, Summer 2014.

Instructor for STAT 3011 *Introduction to Statistics*, Fall 2013.

Teaching assistant
TA for STAT 8054 *Advanced Statistical Computing*, Spring 2015.

TA for STAT 8112 *PhD Asymptotic Statistics*, Spring 2015.

TA for STAT 5303 *Masters level Design of Experiments*, Fall 2014.

TA for STAT 3011 *Introduction to Statistics*, Spring 2014.

TA for STAT 5102 *Masters level Statistical Theory*, Spring 2013.

TA for STAT 4101 *Statistical Theory*, Fall 2012.

Research assistant
Ruth G. Shaw Lab, University of Minnesota, Summer 2016.

Georgiana May, University of Minnesota, Summer 2015.

Consulting
University of Minnesota Statistical Consulting Center, Spring 2016.

▬▬▬▬ Presentations

"Model-free Weighted Envelope Methodology"
    July 2020: The 4th International Conference on Econometrics and Statistics, Seoul.

"Efficient and minimal length parametric conformal prediction regions"
    December 2019: The 12th International Conference of the ERCIM WG on Computational and Methodological Statistics, London.

"Agnostic and parametric approaches to inference: conformal prediction and randomized control trials"
    December 2018: Department of Statistics, University of Illinois at Urbana-Champaign.
    November 2018: Department of Statistics, Texas A& M University.
    October 2018: Department of Biostatistics, Rutgers University.
    October 2018: Department of Biostatistics, Indiana University.
    September 2018: Crawford Lab, Yale University.

"Weighted Envelope Estimation to Handle Variability in Model Selection"
    August 2018: Joint Statistical Meetings, Vancouver.

"Conformal prediction for generalized linear models"
    April 2018: Crawford Lab, Yale University.

"Reproducible Research"
    November 2017: Crawford Lab, Yale University.

"Maximum Likelihood Estimation in Exponential Families"
    May 2017: Student Seminar, University of Minnesota.

"Envelope methodology applied to aster models"
    August 2015: Joint Statistical Meetings, Seattle, Washington.

"Central limit theory under additive deformations"
    November 2015: Student Seminar, University of Minnesota.

"Enveloping the Aster Model"
    October 2015: poster at the ASA Fall Research Conference, Mayo clinic, Rochester, MN.

Service

Departmental
2019: Seminar Chair, PhD admissions committee

Conferences
Session organizer for "Modern Methods for Semi-Parametric Regression", The 32nd New England Statistics Symposium (2018), University of Massachusetts, Amherst.

Reviewer
Biometrika, *Statistica Sinica*, *Statistics and Probability Letters*, *SIAM/ASA Journal on Uncertainty Quantification*, *The American Statistician*, *United States Geological Survey*, *Punjab University Journal of Mathematics*

Community
Volunteer mathematics tutoring through the Hennepin County Library system (2016-2017).

Awards and Honors

Summer Research Fellowship, 2013. This summer work led to the paper "An Integrated Analysis of Phenotypic Selection on Insect Body Size and Development Time".

Southern Illinois University at Carbondale undergraduate student tuition waiver, a scholarship awarded on the basis of academic achievement.
    received Fall 2009, Fall 2008, and Spring 2008.