Daniel J. Eck

Curriculum Vitae

Computing Applications Building, Room 152
605 E. Springfield Ave.
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

I am an applied statistician developing statistical methodologies to address real-world challenges across science, social science, and sports. My research integrates rigorous statistical modeling with domain expertise from interdisciplinary collaborators to yield both methodological innovation and practical insight. I am also committed to communicating statistics beyond academia through accessible, public-facing work alongside peer-reviewed publications.

Professional Honors and Recognitions

Research featured in "Bonds Beats the Babe! Statistical Model Crowns a New 'Greatest' in Baseball," *New York Times* Science, 12 August 2025 (front-page of print edition, 13 August 2025). `https://www.nytimes.com/2025/08/12/science/baseball-statistics-babe-bonds.html`

List of Teachers Ranked as Excellent by Their Students, Spring 2023 and Spring 2024.

2021 Jack Youden Prize for Best Expository Paper published in the 2020 issue of *Technometrics*

Submitted/Working Papers

* - indicates student author

Elisha Cohen, Adrian Burgos Jr., *Shen Yan, and **Daniel J. Eck** (2025+). Contextualizing Historical

Impact: An Era-Adjusted Modeling Approach.

*Jeonghwan Lee, Lu Yang, **Daniel J. Eck** (2025+) `assessor`: Assessment Tools for Regression Models with Non-continuous Outcomes.

*David P. Lundquist and **Daniel J. Eck** (2025+). Forecast Adjustment Under Shocks: A Unification. `https://github.com/lunddave/synthetic_vol_forecasting/blob/main/unifying_forecast_adjustment.pdf`

*David P. Lundquist and **Daniel J. Eck** (2025+). Volatility Forecasting Using Similarity-based Parameter Correction and Aggregated Shock Information. Preprint at: `https://arxiv.org/abs/2406.08738`.

Publications

Journal Publications

19. Adrian Burgos Jr., *Shen Yan, and **Daniel J. Eck** (2025). A Change at the Top of the Lineup: Statistics, History, and Creation of a Cross-Era Comparison Model to Assess Baseball's All-Time Greats. *NINE: A Journal of Baseball History and Culture, to appear.*

18. *Shen Yan, Adrian Burgos Jr., Christopher Kinson, and **Daniel J. Eck** (2025). Comparing Baseball Players Across Eras via Novel Full House Modeling. *Annals of Applied Statistics*, **19(2)**, 1778–1799.
Preprint: `https://arxiv.org/abs/2207.11332`
Website: `https://eckeraadjustment.web.illinois.edu/`

17. Dhananjay Gotarkar, Anthony Digrado, Yu Wang, Lynn Doran, Ignacio Sparrow-Munoz, Sarah Chung, Nicholas Lisa, Gerardo Amaro, Farwah Wasiq, Bethany Blakely, Brian Diers, **Daniel J. Eck**, Steven Burgess (2025). Variation in relaxation of non-photochemical quenching between the founder genotypes of the soybean (Glycine max) nested association mapping population. *The Plant Journal*, **121**, 2, e17219.

16. **Daniel J. Eck** (2023). General model-free weighted envelope estimation. *Electronic Journal of Statistics*, **17(1)**, 519–547.

15. Ellen S. Fireman, *Zachary S. Donnini, and Michael Weissman, and **Daniel J. Eck** (2023). Are in- person lectures beneficial for all students? A Study of a Large Statistics Class. *Journal of Educational Technology Systems*, **51(4)**, 476–502.
Preprint: `https://arxiv.org/abs/2101.06755`.

14. Lea K. Richardson, Jared Beck, **Daniel J. Eck**, Ruth G. Shaw, and Stuart Wagenius (2023). Spring fires improve summer mating opportunities and influence multiple components of reproductive fitness. *American Journal of Botany*, **110**, 4, e16160.

13. **Daniel J. Eck**, Olga Morozova, and Forrest W. Crawford (2022). Randomization for infectious disease interventions in clustered study populations. *Journal of Mathematical Biology*, **85(4)**, 37.
Preprint: `https://arxiv.org/abs/1808.05593`.

12. Georgiana May, Ruth G. Shaw, Charles J. Geyer, and **Daniel J. Eck** (2022). Do defensive symbionts cause selection for greater pathogen virulence? *The American Naturalist*, **199**, 2, 252-–265.

11. *Jilei Lin and **Daniel J. Eck** (2021). Minimizing post-shock forecasting error through aggregation of outside information. *International Journal of Forecasting*, **37**, 4, 1710—1727.
Preprint: `https://arxiv.org/abs/2008.11756`

10. **Daniel J. Eck** and Charles J. Geyer (2021). Computationally efficient likelihood inference in exponential families when the maximum likelihood estimator does not exist. *Electronic Journal of Statistics*, **15(1)**: 2105—2156.
Preprint: `https://arxiv.org/abs/1803.11240`

9. **Daniel J. Eck**, R. Dennis Cook, Cristopher J. Nachtsheim, and Thomas A. Albrecht (2020). Dimensional analysis in multivariate design of experiments. *Technometrics*, **62**, 1, 6—20.

8. Si Cheng, **Daniel J. Eck**, and Forrest W. Crawford (2020). Estimating the size of a hidden finite set: large-sample behavior of estimators. *Statistics Surveys*, 14, 1—31.

7. **Daniel J. Eck**, Charles J. Geyer, and R. Dennis Cook (2020). Combining envelope methodology and aster models for variance reduction in life history analyses. *Statistical Planning and Inference*, **205**, 283—292.

6. **Daniel J. Eck** (2020). Challenging nostalgia and performance metrics in baseball. *Chance*, **33**, 1, 16—25.
Shiny app: `https://deck13.shinyapps.io/challenging_baseball_nostalgia/`

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

4. Rickard J. Kohler, Susan A. Arnold, **Daniel J. Eck**, Christopher B. Thomson, Matthew A. Hunt, and G. Elizabeth Pluhar (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. **Daniel J. Eck** and R. Dennis Cook (2017). Weighted envelope estimation to handle volatility in model selection. *Biometrika*, **104**, 743–749.

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

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

Public Engagement and Commentary

4. **Daniel J. Eck** (2025). A Case Study in Publication Practices: Full House Modeling. *Amstat News*, A Statistician's View column (November 2025).
`https://magazine.amstat.org/blog/2025/11/03/stat-view-full-house-modeling/`

3. **Daniel J. Eck** (2025). Quoted expert on team performance variability in "The Colorado Rockies are off to one of the worst starts in MLB history," by Joe Murphy and David K. Li. *NBC News*, May 6, 2025.
`https://www.nbcnews.com/news/sports/colorado-rockies-historic-2025-start`

2. **Daniel J. Eck** (2020). Challenging WAR and other statistics as era-adjustment tools.
`https://community.fangraphs.com/challenging-war-and-other-statistics-as-era-adjustment-tools/`

1. **Daniel J. Eck** with *Charles Young and David Dalpiaz (2020). SEAM Methodology for Player Matchup Evaluations.
`https://community.fangraphs.com/seam-methodology-for-player-matchup-evaluations/`

Technical Reports

*Suyoung Park, Alexander E. Lipka, and **Daniel J. Eck** (2022). Robust model-based estimation for binary outcomes in genomics studies.
Preprint: `https://arxiv.org/abs/2110.15189`

*Julia Wapner, David Dalpiaz, and **Daniel J. Eck** (2022). SEAM methodology for context-rich player matchup evaluations in baseball.
Preprint: `https://arxiv.org/abs/2005.07742`
Website: `https://seam.stat.illinois.edu`

Daniel J. Eck and Charles J. Geyer (2021). Computationally efficient likelihood inference in exponential families when the maximum likelihood estimator does not exist. `https://arxiv.org/abs/1803.11240`

Daniel J. Eck (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`

Daniel J. Eck, Ruth G. Shaw, Charles J. Geyer, and Joel G. Kingsolver (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`

Daniel J. Eck (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

Qiyang Wang and **Daniel J Eck** (2025). `R` package **postshock** (package for Post-Shock Forecasting with an Intercept Correction Modeling Framework). Version 1.0.

Michael Friendly, Chris Dalzell, Martin Monkman, Dennis Murphy, Vanessa Foot, Justeena Zaki-Azat, **Daniel J Eck**, and Sean Lahman (2025). `R` package **Lahman** (Sean 'Lahman' Baseball Database). Version 12.0-0. `https://cran.r-project.org/web/packages/Lahman/index.html`

Daniel J Eck and *Muskan Bhatla and *Zheer Wang (2024). `R` package **fullhouse** (Package for Estimating Talent and Era-Adjusted Performance Metrics). Current version 1.0. `https://github.com/DEck13/fullhouse/`

David Dalpiaz and **Daniel J. Eck** (2020). `R` package **seam** (Functions to Apply SEAM Methodology). Current version 0.0.0.9001. `https://github.com/ecklab/seam/`

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

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

Daniel J. Eck (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`

Teaching and Appointments

University of Illinois

Classroom teaching
Instructor for STAT 430 Baseball Analytics.
   Spring 2025, Spring 2024, Spring 2023, Fall 2022

Several students from STAT 430 (Baseball Analytics) have gone on to careers in sports data science, including Jack Banks (New York Yankees) and Riku Komatani (Seattle Mariners).

Instructor for STAT 528 Advanced Regression II.
   Spring 2025, Spring 2024, Spring 2023, Spring 2022, Spring 2021

Instructor for STAT 385 Statistical Programming Methods.
  Fall 2025, Fall 2024, Fall 2023, Spring 2021, Spring 2020, Fall 2019.

Open-Access Instructional Materials

Daniel J. Eck (2025). Teaching the Binomial Distribution Through Baseball: Comparing Players Across Eras with Era-Adjusted WAR.
`https://ecklab.github.io/binomial-distribution-example.html`

Daniel J. Eck (2025). Primer for Full House Modeling.
`https://cran.r-project.org/web/packages/Lahman/vignettes/FHM-primer.html`

University of Minnesota

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

Chicago Cubs Baseball Analytics, 2024-
University of Minnesota Statistical Consulting Center, 2016.

Mentoring

PhD Students

Jun Hee Kim, 2025- (primary advisor).
Dimitri Mandravelis, 2024- (primary advisor).
David Lundquist, 2021-2025 (primary advisor). Current appointment: Apple.
Shen Yan, 2020-2024 (primary advisor). Current appointment: Postdoc at UIUC.

Yihe Wang, 2020-2021 (dissertation committee). Current appointment: Meta.

MD Students

Jacob Gasienica, 2023-2024. Current appointment: Western Michigan University.
Travis Neuberger, 2023-2024. Current appointment: Carle Illinois College of Medicine.

Master's Students

Ryan To, 2025-
Logan Blancett, 2025-
Qiyang Wang, 2025-
Gan Yao, 2022-2024. Current appointment: PhD student at The University of Hong Kong.
Colin Alberts, 2022-2024. Current appointment: Cisco.
Anurag Anand, 2021.
Suyoung Park, 2020-2021. Current appointment: Bayer.
Jilei Lin, 2019-2021. Current appointment: PhD student at George Washington Uninversity.

Undergraduate Students

Idrees Kudaimi, 2024-
Christopher Ye, 2025-
Ashrith Anumala, 2024-2025.
Colin Doherty, 2024-2025.
Zheer Wang, 2024-2025. Current appointment: MS student at Georgia Tech.
Mohit Singh, 2024-2025.
Muskan Bhatla, 2024. Current appointment: Deloitte.
Jamin Kim, 2023-2024.
Ryan To, 2023-2024. Current appointment: MS student at UIUC.
Aidan Glickman, 2023. Current appointment: IMC.
Jack Banks, 2022-2023. Current appointment: New York Yankees.
Michael Escobedo, 2022-2023.
Sicong He, 2021-2023. Current appointment: JP Morgan.
Julia Wapner, 2021-2022. Current appointment: Baltimore Orioles.
Christian Chase, 2021-2022. Current appointment: Vanderbilt Law School.
Danyu Sun, 2020-2021.
Charles Young, 2019-2020. Current appointment: Pittsburgh Pirates.

Presentations

"Full House Modeling: Rethinking fairness, extremes, and historical comparisons in statistics"
  August 2025: EcoSta 2025
  August 2025: Saberseminar

"Sports Analytics Panelist"
    February 2024: Illinois Sports Business Conference

"Comparing baseball players across eras via the novel Full House Model"
    August 2023: SaberSeminar 2023
    August 2023: EcoSta 2023
    February 2023: Department of Mathematics and Statistics, South Dakota State University.
    October 2022: Department of Mathematics, Southern Illinois University.
    October 2022: School of Statistics, University of Minnesota.
    June 2022: Blackwell Summer Scholars Program, University of Illinois Urbana-Champaign.
    May 2022: University High School

"Coordinated Online Learning (COOL): A Model for Online and In-Person Lecture Options
    May 2022: University High School

"Minimizing post-shock forecasting error through aggregation of outside information"
    December 2022: CMStatistics 2022, cancelled due to COVID.
    December 2021: School of Business, University of Kansas

"Multivariate Design of Experiments for Engineering Dimensional Analysis"
    November 2021: Invited talk for the Fall Technical Conference

"Statistics Demonstration."
    October 2021: Long Lab, University of Illinois Urbana-Champaign

"Challenging nostalgia and performance metrics in baseball."
    August 2021: Invited talk for the Chance section at JSM

"Do defensive symbionts cause selection for greater pathogen virulence? (an aster analysis)"
    October 2020: Program of Ecology, Evolution, and Conservation Biology, University of Illinois

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

"Computationally efficient likelihood inference in exponential families when the maximum likelihood estimator does not exist"
    May 2020: 2020 MEETING OF ISDSA, Notre Dame

"Efficient and minimal length parametric conformal prediction regions"
    December 2019: 12th International Conference of the ERCIM, 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
2024-2025: PhD admissions, Undergraduate research, PhD Qualifying Exam, Bohrer workshop, 40th anniversary workshop
2023-2024: PhD admissions, Undergraduate research, PhD Qualifying Exam, Bohrer workshop
2022-2023: PhD admissions, Undergraduate research, PhD Qualifying Exam, Bohrer workshop
2021-2022: PhD admissions, Undergraduate research, PhD Qualifying Exam, Bohrer workshop
2020-2021: PhD admissions, Curriculum, Undergraduate research
2019-2020: Seminar chair, PhD admissions

Created a UIUC-Chicago Cubs internship program (with Ehsan Bokhari and David Dalpiaz).

Courses
2022: Developed the STAT 430 Baseball Analytics course.
2020: Developed the STAT 528 course.
2019: Revamped the STAT 385 class (with Christopher Kinson).

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

Associate Editor
Statistical Analysis and Data Mining, 2023-

Reviewer
The American Statistician, The Annals of Statistics, Biometrics, Biometrika, Econometric Reviews, Evolution, Frontiers in Applied Mathematics and Statistics, Journal of Computational and Graphical Statistics, Journal of Official Statistics, Journal of Quantitative Analysis in Sports, Journal of Sports Analytics, Journal of The American Statistical Association, Journal of The Royal Statistical Society series B, Journal of Statistical Planning and Inference, Punjab University Journal of Mathematics, SIAM/ASA Journal on Uncertainty Quantification, Statistica Sinica, Statistics, Statistics and Probability Letters, Statistical Science, United States Geological Survey

General
Junior Liaison Contact, NISS, 2020-

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

Student 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.