Heike Hofmann

Curriculum Vitae

346D Hardin Hall
Department of Statistics
University of Nebraska, Lincoln, NE
✉ hhofmann4@unl.edu
heike

Education

2000 **Ph.D.**, *Statistics*, Augsburg University (Germany).

1998 **M.Sc.**, *Mathematics*, Augsburg University (Germany).
(minor in Computer Science)

Professional Experience

Appointment

2024–now **Full Professor**, *Statistics*, University of Nebraska-Lincoln.

Other Affiliations

2024–now **Affiliate**, *Statistics*, Iowa State University.

2015–now **Core Faculty**, *Center for Statistics and Applications in Forensic Evidence*, CSAFE (ISU).

Previous Appointments

2013–24 **Full Professor**, *Statistics*, Iowa State University.

2019–24 **Kingland Professor**, Iowa State University.

2021–24 **Professor in Charge**, *Data Science*, Iowa State University.

2019–20 **Interim Professor in Charge**, *Data Science*, Iowa State University.

2007–13 **Associate Professor**, *Statistics*, Iowa State University.

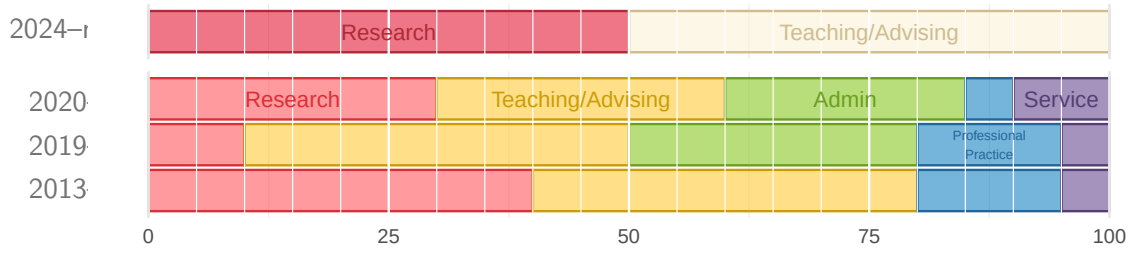
2002–07 **Assistant Professor**, *Statistics*, Iowa State University.

2009–24 **Core Faculty**, *Bioinformatics and Computational Biology*, Iowa State University.

2009–24 **Faculty**, *Human Computer Interaction*, Iowa State University.

2001 **Post Doc**, *Statistics*, AT&T Labs, Florham Park, NJ.

2000–01 **Post Doc**, *Mathematics*, Augsburg University.



Grants

Active

2024–27 **NSF: SoS Collaborative Grant**, *A Testing Framework for Better Visual Communication Practices*, PI, Total: $750,000, Sub: $305,912 (UNL award).

2022–25 **NIJ: Collaborative Grant**, *Advancing the Understanding of 3D Imaging for Firearms Identification*, PI, Total: $303,471, Sub: $59,850 (ISU sub-award).

Previously Funded

2016–25 **CSAFE: Internal award**, *Statistical analysis of firearms evidence*, PI, Total: $2,300,000.

2020–24 **NSF: CNS - S&CC**, *Overcoming the Rural Data Deficit to Improve Quality of Life and Community Services in Smart & Connected Small Communities*, Senior Personnel, Total: $1,500,000.

2021–23 **NISS: (non-competitive)**, *Interactive Visualization for Education Data and Statistics*, PI, Total: $98,663.

2017–21 **Schneider Electric: (non-competitive)**, *Statistical Computing for Exploratory Data Analysis*, PI, Total: $136,249.

2023 **Google: Google Summer of Code**, *You Draw It.*, co-PI, Total: $6,000.

2019 **Google: Google Summer of Code**, *Parallel Coordinate Plots in ggplot2.*, co-PI, Total: $6,000.

2017 **Google: Google Summer of Code**, *Systematic living reviews*, co-PI, Total: $5,000.

2017 **Google: Google Summer of Code**, *Methods for quantile-quantile plots in ggplot2*, co-PI, Total: $5,000.

2017 **ISU Honors Program: Summer Research Grant**, *Research Funding for Ryan Goluch***, PI, Total: $1,000.

2016–19 **ISU: PIIR DDSI**, *Bridging the digital divide in data science: invention and refinement of shared data science infrastructures*, co-PI, Total: $450,000.

2011 **ISU: LAS Strategic Initiatives Proposals**, *GE Health Data*, co-PI, Total: $30,000.

2008 **ISU: LAS Foreign Travel Grant**, Total: $800.

2008 **ISU: LAS CAC COLL**, *mysql Database for online storage of course material*, Total: $4,000.

2005 **ISU: LAS Foreign Travel Grant**, Total: $513.

Awards

External Recognition

2021–now **Elected Member**, *International Statistical Institute*.

2015–now **Elected Fellow**, *American Statistical Association*.

2018 **Statistical Partnerships Among Academe, Industry & Government (SPAIG) award**, *American Statistical Association*, for CSAFE and NIST partnership; key contributor.

Internal Award

2020–24 **Kingland Faculty Fellow**, *Iowa State University*.

2021 **ISU Interdisciplinary Team Research Award**, *Data Sciences for the Public Good*, with Todd Abraham, Cassandra Dorius, Shawn Dorius, Jim Reecy, Christopher Seeger, and Adisak Sukul..

2021 **ISU Extension and Outreach Excellence in Research-Based Programming Award**, *Data Science for the Public Good*, Young Scholars Program team.

2020 **Outstanding Achievement in Teaching**, *Liberal Arts & Sciences, Iowa State University*.

2016 **Mid Career Excellence in Research/Artistic Creativity**, *Liberal Arts & Sciences, Iowa State University*.

2006 **Early Excellence in Research/Artistic Creativity**, *Liberal Arts & Sciences, Iowa State University*.

Competitions

Student advisees indicated with *(graduate) and **(undergraduate).

2016 **Best Macro Paper 2016**, *Managerial Gender Diversity and Firm Performance*, with A. Schwab, J.D. Werbel, and P.L. Henriques. An Integration of Different Theoretical Perspectives. Group & Organization Management, 41(1), 5–31, 2016, doi: 10.1177/1059601115588641.

2016 **Best SAM Paper Award 2016**, *American Statistical Association - Wiley*, with H. Wickham and D. Cook. Visualizing statistical models: Removing the blindfold.

2013 **IEEE VisWeek Redesign Competition**, *First Place*, with H. Hofmann-Sieber. Redesigning the traditional logo sequence plot.

2009 **American Statistical Association Data Expo**, *Second Place*, with D. Cook and students from the Statistical Graphics working group*. Delayed, Cancelled, On Time, Boarding, ... flying over the USA.

2006 **American Statistical Association Data Expo**, *Second Place*, with D. Cook and H. Wickham*. Glaciers melt as Mountains warm..

2005 **IEEE InfoVis Data Contest**, *First Place*, with D. Cook, H. Wickham*, Junjie Sun*, and Christian Röttger. Boom and Bust of Technology Companies at the Turn of the 21st Century.

Student Best Papers

2025 **Interactive Visualization Framework for Forensic Bullet Comparisons.**, *American Statistical Association Statistical Computing*, Nathan Rethwitsch**.

2024 **A reproducible pipeline for extracting representative signals from wire cuts.**, *American Statistical Association Statistical Computing*, Yuhang Lin*.

2022 **Analysis Of Vehicular Crashes In Iowa.**, *First Place. Undergraduate Statistics Project Competition (USCLAP)*, Zachary Swayne**, Nathan Rethwisch**.

2020 **The generalized parallel coordinate plot.**, *American Statistical Association Statistical Graphics*, Yawei Ge*.

2016 **Matching Bullets**, *American Statistical Association Statistical Imaging*, Eric Hare*.

2016 **Using the geomnet Package: Visualizing African Slave Trade, 1514 – 1866.**, *American Statistical Association Statistical Graphics*, Sam Tyner*.

2015 **Introductory Statistics with intRo.**, *American Statistical Association Statistical Graphics*, Andee Kaplan*and Eric Hare*.

2014 **The curse of three dimensions: Why your brain is lying to you.**, *American Statistical Association Statistical Graphics*, Susan Vanderplas*.

2013 **Are you Normal? The Problem of Confounded Residual Structures in Hierarchical Linear Models.**, *American Statistical Association Statistical Graphics*, Adam Loy*.

2012 **Where's Waldo: Closer Look at Line-up Plots.**, *American Statistical Association Statistical Graphics*, Niladri Roy-Chowdhury*(with D. Cook).

2011 **Visual Statistical Inference for Regression Parameters.**, *American Statistical Association Statistical Graphics*, Mahbub Majumder*(with D. Cook).

Publications

Student advisees indicated with *(graduate) and **(undergraduate).

Books

2. Unwin, A., Theus, M., and **Hofmann**, **H.** (2006). *Graphics of Large Datasets: Visualizing a Million*. Statistics and Computing. New York, NY: Springer 2006. ISBN: 978-0-387-32906-2. DOI: 10.1007/0-387-37977-0.

1. **Hofmann**, **H.** (2001a). *Graphical Tools for the Exploration of Multivariate Categorical Data*. Books on Demand 2001. ISBN: 978-3-8311-1660-7.

Book Chapters

3. VanderPlas, S., Carriquiry, A., **Hofmann**, **H.**, Hamby, J., and Tai, X. (2020). "An Introduction to Firearms Examination for Researchers in Statistics". In: *Handbook of Forensic Statistics*. Chapman and Hall/CRC 2020. DOI: 10.1201/9780367527709.

2. **Hofmann**, **H.** (2008). "Mosaic Plots and Their Variants". In: *Handbook of Data Visualization*. Ed. by C.-h. Chen, W. Härdle, and A. Unwin. Springer Handbooks Comp.Statistics. Berlin, Heidelberg: Springer 2008, pp. 617–642. DOI: 10.1007/978-3-540-33037-0_24.

1. Wurtele, E. S., Li, L., Berleant, D., Cook, D., Dickerson, J. A., Ding, J., **Hofmann**, **H.**, Lawrence, M., Lee, E.-k., Li, J., Mentzen, W., Miller, L., Nikolau, B. J., Ransom, N., and Wang, Y. (2007). "MetNet: Systems Biology Tools for Arabidopsis". In: *Concepts in Plant Metabolomics*. Ed. by B. J. Nikolau and E. S. Wurtele. Dordrecht: Springer Netherlands 2007, pp. 145–157. DOI: 10.1007/978-1-4020-5608-6_10.

Peer Reviewed Publications

2025

3. Kiegan Rice, Bell, S., Wing, T., du Toit, N., and **Hofmann**, **H.** (2025). "Measuring Real-World Understanding of Patterns in Data Graphics". In: *IEEE Computer Graphics and Applications*. DOI: 10.1109/MCG.2025.3565834.

2. Majumder, M., **Hofmann**, **H.**, and Cook, D. (2025). "Effect of Human Factors on Visual Statistical Inference". In: *WIREs Computational Statistics* 17.3. ISSN: 1939-0068. DOI: 10.1002/wics.70033. URL: http://dx.doi.org/10.1002/WICS.70033.

1. Robinson, E., **Hofmann**, **H.**, and Vanderplas, S. (2025). "A Guide to Designing Experiments to Test Statistical Graphics". In: *WIREs Computational Statistics* 17.2. ISSN: 1939-0068. DOI: 10.1002/wics.70032. URL: http://dx.doi.org/10.1002/wics.70032.

2024

4. Cuellar, M., Gao, S., and **Hofmann**, **H.** (2024). "An algorithm for forensic toolmark comparisons". In: *Forensic Science International: Synergy* 9.100543. ISSN: 2589-871X. DOI: https://doi.org/10.1016/j.fsisyn.2024.100543.

3. Ju, W., VanderPlas, S. R., and **Hofmann**, **H.** (2024). "One Model that Fits Them All – Psychometrics With Generalized Linear Mixed Effects Models". In: *Electronic Imaging* 36.1, pp. 358-1–358-8. DOI: 10.2352/EI.2024.36.1.VDA-358.

2. Rice, K., **Hofmann**, **H.**, Toit, N. du, and Mulrow, E. (2024). "Testing Perceptual Accuracy in a U.S. General Population Survey Using Stacked Bar Charts". In: *Journal of Data Science*, pp. 1–18. ISSN: 1680-743X. DOI: 10.6339/24-JDS1121.

1. Vanderplas, S., Carriquiry, A., and **Hofmann**, **H.** (2024). "Hidden Multiple Comparisons Increase Forensic Error Rates". In: *Proceedings of the National Academy of Sciences* 121.25, e2401326121. DOI: 10.1073/pnas.2401326121.

2023

3. Jeppson, H.* and **Hofmann**, **H.** (2023). "Generalized Mosaic Plots in the ggplot2 Framework". In: *The R Journal* 14.4, pp. 50–78. DOI: 10.32614/RJ-2023-013.

2. VanderPlas, S., Ge, Y.*, Unwin, A., and **Hofmann**, **H.** (2023). "Penguins Go Parallel: A Grammar of Graphics Framework for Generalized Parallel Coordinate Plots". In: *Journal of Computational and Graphical Statistics* 32.4, pp. 1572–1587. DOI: 10.1080/10618600.2023.2195462.

1. Zemmels, J.*, Vanderplas, S., and **Hofmann**, **H.** (2023). "A Study in Reproducibility: The Congruent Matching Cells Algorithm and cmcR package". In: *R Journal* 14 (4), pp. 79–102. DOI: 10.32614/RJ-2023-014.

2022

1. Ju, W.* and **Hofmann**, **H.** (2022). "An Open-Source Implementation of the CMPS Algorithm for Assessing Similarity of Bullets". In: *The R Journal* 14.2, pp. 267–285. DOI: 10.32614/RJ-2022-035.

2021

3. Goode, K.* and **Hofmann**, **H.** (2021). "Visual Diagnostics of an Explainer Model: Tools for the Assessment of LIME Explanations". In: *Statistical Analysis and Data Mining: The ASA Data Science Journal* 14.2, pp. 185–200. DOI: 10.1002/sam.11500.

2. Laurent, A.*, Lyu, X.*, Kyveryga, P., Makowski, D., **Hofmann**, **H.**, and Miguez, F. (2021). "Interactive Web-based Data Visualization and Analysis Tool for Synthetizing on-Farm Research Networks Data". In: *Research Synthesis Methods* 12.1, pp. 62–73. DOI: 10.1002/jrsm.1440.

1. VanderPlas, S., Röttger, C., Cook, D., and **Hofmann**, **H.** (2021). "Statistical Significance Calculations for Scenarios in Visual Inference". In: *Stat* 10.1, e337. DOI: 10.1002/sta4.337.

2020

5. **Hofmann**, **H.**, Carriquiry, A., and Vanderplas, S. (2020). "Treatment of Inconclusives in the AFTE Range of Conclusions". In: *Law, Probability and Risk* 19.3-4, pp. 317–364. DOI: 10.1093/lpr/mgab002.

4. Lyu, X.*, Berg, E. J., and **Hofmann**, **H.** (2020). "Empirical Bayes Small Area Prediction under a Zero-Inflated Lognormal Model with Correlated Random Area Effects". In: *Biometrical Journal* 62.8, pp. 1859–1878. DOI: 10.1002/bimj.202000029.

3. Rice, K.*, Genschel, U., and **Hofmann**, **H.** (2020). "A Robust Approach to Automatically Locating Grooves in 3D Bullet Land Scans". In: *Journal of Forensic Sciences* 65.3, pp. 775–783. DOI: 10.1111/1556-4029.14263.

2. Vanderplas, S., Cook, D., and **Hofmann**, **H.** (2020). "Testing Statistical Charts: What Makes a Good Graph?" In: *Annual Review of Statistics and Its Application* 7.1, pp. 61–88. DOI: 10.1146/annurev-statistics-031219-041252.

1. Vanderplas, S., Nally, M., Klep, T., Cadevall, C., and **Hofmann**, **H.** (2020). "Comparison of Three Similarity Scores for Bullet LEA Matching". In: *Forensic Science International* 308, p. 110167. DOI: 10.1016/j.forsciint.2020.110167.

2019

4. Carriquiry, A., **Hofmann**, **H.**, Tai, X. H., and VanderPlas, S. (2019). "Machine Learning in Forensic Applications". In: *Significance* 16.2, pp. 29–35. DOI: 10.1111/j.1740-9713.2019.01252.x.

3. **Hofmann**, **H.**, Wickham, H.*, and Cook, D. (2019). "The 2013 Data Expo of the American Statistical Association". In: *Computational Statistics* 34.4, pp. 1443–1447. DOI: 10.1007/s00180-019-00923-w.

2. Krishnan, G.* and **Hofmann**, **H.** (2019). "Adapting the Chumbley Score to Match Striae on Land Engraved Areas (LEAs) of Bullets," in: *Journal of Forensic Sciences* 64.3, pp. 728–740. DOI: 10.1111/1556-4029.13950.

1. VanderPlas, S., Ryan, G. C.*, and **Hofmann**, **H.** (2019). "Framed! Reproducing and Revisiting 150-Year-Old Charts". In: *Journal of Computational and Graphical Statistics* 28.3, pp. 620–634. DOI: 10.1080/10618600.2018.1562937.

2018

2. Almeida, A., Loy, A., and **Hofmann**, **H.** (2018). "ggplot2 Compatible Quantile-Quantile Plots in R". In: *The R Journal* 10.2, pp. 248–261. URL: https://journal.r-project.org/archive/2018/RJ-2018-051/index.html.

1. Chowdhury, N. R.*, Cook, D., **Hofmann**, **H.**, and Majumder, M.* (2018). "Measuring Lineup Difficulty By Matching Distance Metrics With Subject Choices in Crowd-Sourced Data". In: *Journal of Computational and Graphical Statistics* 27.1, pp. 132–145. DOI: 10.1080/10618600.2017.1356323.

2017

8. Hare, E.*, **Hofmann**, **H.**, and Carriquiry, A. (2017a). "Algorithmic Approaches to Match Degraded Land Impressions". In: *Law, Probability and Risk* 16.4, pp. 203–221. DOI: 10.1093/lpr/mgx018.

7. — (2017b). "Automatic Matching of Bullet Land Impressions". In: *The Annals of Applied Statistics* 11.4, pp. 2332–2356. DOI: 10.1214/17-AOAS1080.

6. *Submitted as an invited response to Donoho's "50 years of Data Science"*.
Hofmann, **H.** and VanderPlas, S. (2017). "All of This Has Happened Before. All of This Will Happen Again: Data Science". In: *Journal of Computational and Graphical Statistics* 26.4, pp. 775–778. DOI: 10.1080/10618600.2017.1385474.

5. **Hofmann**, **H.**, Wickham, H., and Kafadar, K. (2017). "Letter-Value Plots: Boxplots for Large Data". In: *Journal of Computational and Graphical Statistics* 26.3, pp. 469–477. DOI: 10.1080/10618600.2017.1305277.

4. Kaplan, A.*, **Hofmann**, **H.**, and Nordman, D. (2017). "An Interactive Graphical Method for Community Detection in Network Data". In: *Computational Statistics* 32.2, pp. 535–557. DOI: 10.1007/s00180-016-0663-5.

3. Loy, A.*, **Hofmann**, **H.**, and Cook, D. (2017). "Model Choice and Diagnostics for Linear Mixed-Effects Models Using Statistics on Street Corners". In: *Journal of Computational and Graphical Statistics* 26.3, pp. 478–492. DOI: 10.1080/10618600.2017.1330207.

2. Tyner, S., Briatte, F., and **Hofmann**, **H.** (2017). "Network Visualization with ggplot2". In: *The R Journal* 9.1, pp. 27–59. DOI: 10.32614/RJ-2017-023.

1. VanderPlas, S. and **Hofmann**, **H.** (2017). "Clusters Beat Trend!? Testing Feature Hierarchy in Statistical Graphics". In: *Journal of Computational and Graphical Statistics* 26.2, pp. 231–242. DOI: 10.1080/10618600.2016.1209116.

2016

5. Cheng, X.*, Cook, D., and **Hofmann**, **H.** (2016). "Enabling Interactivity on Displays of Multivariate Time Series and Longitudinal Data". In: *Journal of Computational and Graphical Statistics* 25.4, pp. 1057–1076. DOI: 10.1080/10618600.2015.1105749.

4. Loy, A.*, Follett, L.*, and **Hofmann**, **H.** (2016). "Variations of Q–Q Plots: The Power of Our Eyes!" In: *The American Statistician* 70.2, pp. 202–214. DOI: 10.1080/00031305.2015.1077728.

3. Schloerke, B., Wickham, H., Cook, D., and **Hofmann**, **H.** (2016). "Escape from Boxland". In: *The R Journal* 8.2, pp. 243–257. URL: https://journal.r-project.org/archive/2016/RJ-2016-044/index.html.

2. Schwab, A., Werbel, J. D., **Hofmann**, **H.**, and Henriques, P. L. (2016). "Managerial Gender Diversity and Firm Performance: An Integration of Different Theoretical Perspectives". In: *Group & Organization Management* 41.1, pp. 5–31. DOI: 10.1177/1059601115588641.

1. VanderPlas, S. and **Hofmann**, **H.** (2016). "Spatial Reasoning and Data Displays". In: *IEEE Transactions on Visualization and Computer Graphics* 22.1, pp. 459–468. DOI: 10.1109/TVCG.2015.2469125.

2015

10. Alekel, D. L., Genschel, U., Koehler, K. J., **Hofmann**, **H.**, Van Loan, M. D., Beer, B. S., Hanson, L. N., Peterson, C. T., and Kurzer, M. S. (2015). "Soy Isoflavones for Reducing Bone Loss Study: Effects of a 3-Year Trial on Hormones, Adverse Events, and Endometrial Thickness in Postmenopausal Women". In: *Menopause* 22.2, p. 185. DOI: 10.1097/GME.0000000000000280.

9. Cheng, X.*, Cook, D., and **Hofmann**, **H.** (2015). "Visually Exploring Missing Values in Multivariable Data Using a Graphical User Interface". In: *Journal of Statistical Software* 68, pp. 1–23. DOI: 10.18637/jss.v068.i06.

8. Chowdhury, N. R.*, Cook, D., **Hofmann**, **H.**, Majumder, M.*, Lee, E.-K., and Toth, A. L. (2015). "Using Visual Statistical Inference to Better Understand Random Class Separations in High Dimension, Low Sample Size Data". In: *Computational Statistics* 30.2, pp. 293–316. DOI: 10.1007/s00180-014-0534-x.

7. Hare, E.*, Buja, A., and **Hofmann**, **H.** (2015). "Manipulation of Discrete Random Variables with discreteRV". In: *The R Journal* 7.1, p. 185. DOI: 10.32614/RJ-2015-015.

6. Loy, A.* and **Hofmann**, **H.** (2015). "Are You Normal? The Problem of Confounded Residual Structures in Hierarchical Linear Models". In: *Journal of Computational and Graphical Statistics* 24.4, pp. 1191–1209. DOI: 10.1080/10618600.2014.960084.

5. Sieber, T., Hare, E.*, **Hofmann**, **H.**, and Trepel, M. (2015). "Biomathematical Description of Synthetic Peptide Libraries". In: *PLOS ONE* 10.6, e0129200. DOI: 10.1371/journal.pone.0129200.

4. Stanfill, B.*, Genschel, U., **Hofmann**, **H.**, and Nordman, D. (2015). "Nonparametric Confidence Regions for the Central Orientation of Random Rotations". In: *Journal of Multivariate Analysis* 135, pp. 106–116. DOI: 10.1016/j.jmva.2014.12.003.

3. VanderPlas, S. and **Hofmann**, **H.** (2015). "Signs of the Sine Illusion – Why We Need to Care". In: *Journal of Computational and Graphical Statistics* 24.4, pp. 1170–1190. DOI: 10.1080/10618600.2014.951547.

2. Wickham, H., Cook, D., and **Hofmann**, **H.** (2015a). "Authors' Response to Discussants". In: *Statistical Analysis and Data Mining: The ASA Data Science Journal* 8.4, pp. 242–244. DOI: 10.1002/sam.11276.

1. — (2015b). "Visualizing Statistical Models: Removing the Blindfold". In: *Statistical Analysis and Data Mining* 8.4, pp. 203–225. DOI: 10.1002/sam.11271.

pre 2015

42. Follett, L.*, Genschel, U., and **Hofmann**, **H.** (2014). "A Graphical Exploration of the Deepwater Horizon Oil Spill". In: *Computational Statistics* 29.1-2, pp. 121–132. DOI: 10.1007/s00180-013-0432-7.

41. Loy, A.* and **Hofmann**, **H.** (2014). "HLMdiag: A Suite of Diagnostics for Hierarchical Linear Models in R". In: *Journal of Statistical Software* 56, pp. 1–28. DOI: 10.18637/jss.v056.i05.

40. Stanfill, B.*, **Hofmann**, **H.**, and Genschel, U. (2014). "Rotations: An R Package for SO(3) Data". In: *The R Journal* 6.1, pp. 68–78. URL: https://journal.r-project.org/archive/2014-1/stanfill-hofmann-genschel.pdf.

39. Xie, Y.*, **Hofmann**, **H.**, and Cheng, X.* (2014). "Reactive Programming for Interactive Graphics". In: *Statistical Science* 29.2, pp. 201–213. DOI: 10.1214/14-STS477.

38. Emerson, J. W., Green, W. A., Schloerke, B.*, Crowley, J.*, Cook, D., **Hofmann**, **H.**, and Wickham, H.* (2013). "The Generalized Pairs Plot". In: *Journal of Computational and Graphical Statistics* 22.1, pp. 79–91. DOI: 10.1080/10618600.2012.694762.

37. **Hofmann**, **H.** and Vendettuoli, M.* (2013). "Common Angle Plots as Perception-True Visualizations of Categorical Associations". In: *IEEE Transactions on Visualization and Computer Graphics* 19.12, pp. 2297–2305. DOI: 10.1109/TVCG.2013.140.

36. Loy, A.* and **Hofmann**, **H.** (2013). "Diagnostic Tools for Hierarchical Linear Models". In: *WIREs Computational Statistics* 5.1, pp. 48–61. DOI: 10.1002/wics.1238.

35. Majumder, M.*, **Hofmann**, **H.**, and Cook, D. (2013). "Validation of Visual Statistical Inference, Applied to Linear Models". In: *Journal of the American Statistical Association* 108.503, pp. 942–956. DOI: 10.1080/01621459.2013.808157.

34. Newell, M. A.*, Cook, D., **Hofmann**, **H.**, Jannink, J.-L., et al. (2013). "An Algorithm for Deciding the Number of Clusters and Validation Using Simulated Data with Application to Exploring Crop Population Structure". In: *The Annals of Applied Statistics* 7.4, pp. 1898–1916. DOI: 10.1214/13-AOAS671.

33. Stanfill, B.*, Genschel, U., and **Hofmann**, **H.** (2013). "Point Estimation of the Central Orientation of Random Rotations". In: *Technometrics* 55.4, pp. 524–535. DOI: 10.1080/00401706.2013.826145.

32. Unwin, A., **Hofmann**, **H.**, and Cook, D. (2013). "Let Graphics Tell the Story-Datasets in R." In: *R Journal* 5.1. URL: https://rjournal.github.io/articles/RJ-2013-012/.

31. Zhao, Y., Cook, D., **Hofmann**, **H.**, Majumder, M., and Chowdhury, N. R. (2013). "Mind Reading: Using an Eye-Tracker to See How People Are Looking at Lineups". In: *International Journal of Intelligent Technologies and Applied Statistics* 6.4, pp. 393–413.

30. **Hofmann**, **H.**, Follett, L.*, Majumder, M.*, and Cook, D. (2012). "Graphical Tests for Power Comparison of Competing Designs". In: *IEEE Transactions on Visualization and Computer Graphics* 18.12, pp. 2441–2448. DOI: 10.1109/TVCG.2012.230.

29. Wickham, H., **Hofmann**, **H.**, Wickham, C., and Cook, D. (2012). "Glyph-Maps for Visually Exploring Temporal Patterns in Climate Data and Models". In: *Environmetrics* 23.5, pp. 382–393. DOI: 10.1002/env.2152.

28. Cook, D. and **Hofmann**, **H.** (2011). "R Graphics (2nd Edition)". In: *Journal of Statistical Software* 43, pp. 1–4. DOI: 10.18637/jss.v043.b03.

27. **Hofmann**, **H.**, Cook, D., Kielion, C.*, Schloerke, B.*, Hobbs, J.*, Loy, A.*, Mosley, L.*, Rockoff, D.*, Huang, Y.*, Wrolstad, D.*, and Yin, T.* (2011). "Delayed, Canceled, on Time, Boarding... Flying in the USA". In: *Journal of Computational and Graphical Statistics* 20.2, pp. 287–290. DOI: 10.1198/jcgs.2011.3de.

26. Shedd-Wise, K. M., Alekel, D. L., **Hofmann**, **H.**, Hanson, K. B., Schiferl, D. J., Hanson, L. N., and Van Loan, M. D. (2011). "The Soy Isoflavones for Reducing Bone Loss Study: 3-Yr Effects on pQCT Bone Mineral Density and Strength Measures in Postmenopausal Women". In: *Journal of Clinical Densitometry* 14.1, pp. 47–57. DOI: 10.1016/j.jocd.2010.11.003.

25. Vendettuoli, M.*, Doyle, E.*, and **Hofmann**, **H.** (2011). "Clustering Microarray Data to Determine Normalization Method". In: *Software Tools and Algorithms for Biological Systems*. Ed. by H. R. Arabnia and Q.-N. Tran. Advances in Experimental Medicine and Biology. New York, NY: Springer 2011, pp. 145–153. DOI: 10.1007/978-1-4419-7046-6_15.

24. Wickham, H., Cook, D., **Hofmann**, **H.**, and Buja, A. (2011). "Tourr: An R Package for Exploring Multivariate Data with Projections". In: *Journal of Statistical Software* 40, pp. 1–18. DOI: 10.18637/jss.v040.i02.

23. Wickham, H. and **Hofmann**, **H.** (2011). "Product Plots". In: *Visualization and Computer Graphics, IEEE Transactions on* 17.12, pp. 2223–2230. DOI: 10.1109/TVCG.2011.227.

22. Hobbs, J.*, Wickham, H.*, **Hofmann**, **H.**, and Cook, D. (2010). "Glaciers Melt as Mountains Warm: A Graphical Case Study". In: *Computational Statistics* 25.4, pp. 569–586. DOI: 10.1007/s00180-010-0202-8.

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19. Wickham, H., Cook, D., **Hofmann**, **H.**, and Buja, A. (2010). "Graphical Inference for Infovis". In: *IEEE Transactions on Visualization and Computer Graphics* 16.6, pp. 973–979. DOI: 10.1109/TVCG.2010.161.

18. Buja, A., Cook, D., **Hofmann**, **H.**, Lawrence, M.*, Lee, E.-K.*, Swayne, D. F., and Wickham, H.* (2009). "Statistical Inference for Exploratory Data Analysis and Model Diagnostics". In: *Philosophical Transactions of the Royal Society of London A: Mathematical, Physical and Engineering Sciences* 367.1906, pp. 4361–4383. DOI: 10.1098/rsta.2009.0120.

17. Lawrence, M.*, Wickham, H.*, Cook, D., **Hofmann**, **H.**, and Swayne, D. F. (2009). "Extending the GGobi Pipeline from R". In: *Computational Statistics* 24.2, pp. 195–205. DOI: 10.1007/s00180-008-0115-y.

16. Wickham, H.*, Lawrence, M.*, Cook, D., Buja, A., **Hofmann**, **H.**, and Swayne, D. F. (2009). "The Plumbing of Interactive Graphics". In: *Computational Statistics* 24.2, pp. 207–215. DOI: 10.1007/s00180-008-0116-x.

15. Buja, A., Swayne, D. F., Littman, M. L., Dean, N., **Hofmann**, **H.**, and Chen, L. (2008). "Data Visualization With Multidimensional Scaling". In: *Journal of Computational and Graphical Statistics* 17.2, pp. 444–472. DOI: 10.1198/106186008X318440.

14. Yan, A.*, Kloczkowski, A., Hofmann, H., and Jernigan, R. L. (2007). "Prediction of Side Chain Orientations in Proteins by Statistical Machine Learning Methods". In: *Journal of Biomolecular Structure and Dynamics* 25.3, pp. 275–287. DOI: 10.1080/07391102.2007.10507176.

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12. Lee, E. K., Cook, D., **Hofmann**, **H.**, Wurtele, E. S., Kim, D., Kim, J., and An, H. (2004). "GeneGobi: Visual Data Analysis Tools for Microarray Data". In: *COMPSTAT 2004 Symposium*, pp. 1373–1380.

11. Ahn, J. S., **Hofmann**, **H.**, and Cook, D. (2003). "A Projection Pursuit Method on the Multidimensional Squared Contingency Table". In: *Computational Statistics* 18.3, pp. 605–626. DOI: 10.1007/BF03354619.

10. **Hofmann**, **H.** (2003). "Constructing and Reading Mosaicplots". In: *Computational Statistics & Data Analysis*. Data Visualization 43.4, pp. 565–580. DOI: 10.1016/S0167-9473(02)00293-1.

9. Unwin, A. R., **Hofmann**, **H.**, and Wilhem, A. F. X. (2002). "Direct Manipulation Graphics for Data Mining". In: *Int. J. Image Grap.* 02.01, pp. 49–65. DOI: 10.1142/s0219467802000469.

8. **Hofmann**, **H.** (2001b). "Generalized Odds Ratios for Visual Modeling". In: *Journal of Computational and Graphical Statistics* 10.4, pp. 628–640. DOI: 10.1198/106186001317243368.

7. **Hofmann**, **H.**, Unwin, A., and Wilhem, A. (2001). "Data Mining and Statistics Introduction". In: *Computational Statistics* 16.3, pp. 317–321. DOI: 10.1007/s001800100069.

6. **Hofmann**, **H.** and Wilhelm, A. (2001). "Visual Comparison of Association Rules". In: *Computational Statistics* 16.3, pp. 399–415. DOI: 10.1007/s001800100075.

5. **Hofmann**, **H.** (2000). "Exploring Categorical Data: Interactive Mosaic Plots". In: *Metrika* 51.1, pp. 11–26. DOI: 10.1007/s001840000041.

4. **Hofmann**, **H.**, Siebes, A. P. J. M., and Wilhelm, A. F. X. (2000). "Visualizing Association Rules with Interactive Mosaic Plots". In: *Proceedings of the Sixth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*. KDD '00. New York, NY, USA: Association for Computing Machinery 2000, pp. 227–235. DOI: 10.1145/347090.347133.

3. Theus, M. and **Hofmann**, **H.** (1998). "Selection Sequences in MANET". In: *Computational Statistics* 13, pp. 77–87.

2. Unwin, A. and **Hofmann**, **H.** (1998). "New Interactive Graphics Tools for Exploratory Analysis of Spatial Data". In: *Innovations in GIS 5 (Selected Papers from the Fifth National Conference On GIS Research UK)*. Routledge Taylor & Francis 1998, pp. 43–52. ISBN: 978-0-367-57935-7.

1. Unwin, A., Hawkins, G., **Hofmann**, **H.**, and Siegl, B. (1996). "Interactive Graphics for Data Sets with Missing Values - MANET". In: *Journal of Computational and Graphical Statistics* 5.2, pp. 113–122. DOI: 10.1080/10618600.1996.10474700.

Refereed Conference Proceedings

10. Vendettuoli, M.*, Cook, D., and **Hofmann**, **H.** (2010). "Qtpaintgui ()-An Integration of Command Line and Graphical User Interface." In: *BIOCOMP* 2010, pp. 624–629.

9. Huang, Y.*, **Hofmann**, **H.**, and Cook, D. (2009). "Tools for Identifying Homogenous Subgroups in Large Data". In: *BIOT-2009*, p. 83.

8. Vendettuoli, M.*, Lawrence, M.*, Cook, D., and **Hofmann**, **H.** (2009). "Graphical Framework for Processing GCMS Data: Integration of Qt Interfaces". In: *BIOT-2009*, p. 89.

7. Lawrence, M.*, Lee, E.-K., Cook, D., **Hofmann**, **H.**, and Wurtele, E. (2006). "exploRase: Exploratory Data Analysis of Systems Biology Data". In: *Fourth International Conference on Coordinated & Multiple Views in Exploratory Visualization (CMV'06)*. Fourth International Conference on Coordinated & Multiple Views in Exploratory Visualization (CMV'06) 2006, pp. 14–20. DOI: 10.1109/CMV.2006.7.

6. **Hofmann**, **H.** (2004). "Interactive Biplots for Visual Modelling". In: *COMPSTAT 2004 Proceedings in Computational Statistics*. Ed. by J. Antoch. Heidelberg: Physica-Verlag HD 2004, pp. 223–234. DOI: 10.1007/978-3-7908-2656-2_18.

5. Unwin, A., **Hofmann**, **H.**, and Bernt, K. (2001). "The TwoKey Plot for Multiple Association Rules Control". In: *Principles of Data Mining and Knowledge Discovery*. Ed. by L. De Raedt and A. Siebes. Red. by G. Goos, J. Hartmanis, and J. Van Leeuwen. Vol. 2168. Berlin, Heidelberg: Springer Berlin Heidelberg 2001, pp. 472–483. DOI: 10.1007/3-540-44794-6_39.

4. Wilhelm, A. and **Hofmann**, **H.** (2000). "Validation of Association Rules by Interactive Mosaic Plots". In: *COMPSTAT*. Ed. by J. G. Bethlehem and P. G. M. van der Heijden. Heidelberg: Physica-Verlag HD 2000, pp. 499–504. DOI: 10.1007/978-3-642-57678-2_70.

3. Unwin, A. and **Hofmann**, **H.** (1999). "GUI and Command-Line-Conflict or Synergy?" In: *Computing Science and Statistics* 1999, pp. 246–253.

2. **Hofmann**, **H.** (1997). "Graphical Stability of Data Analysing Software". In: *Classification and Knowledge Organization*. Ed. by R. Klar and O. Opitz. Studies in Classification, Data Analysis, and Knowledge Organization. Berlin, Heidelberg: Springer 1997, pp. 36–43. DOI: 10.1007/978-3-642-59051-1_5.

1. Theus, M., **Hofmann**, **H.**, Siegl, B., and Unwin, A. (1997). "Manet Extensions to Interactive Statistical Graphics for Missing Values". In: *In New Techniques and Technologies for Statistics II* 1997.

Other Publications

7. **Hofmann**, **H.**, Cook, D., Kaplan, A.*, Hare, E.*, Leos-Barajas, V.*, Sievert, C.*, and Tyner, S.* (2015). "On the Move at DinoFun World". In: *2015 IEEE Conference on Visual Analytics Science and Technology (VAST)*. 2015 IEEE Conference on Visual Analytics Science and Technology (VAST) 2015, pp. 159–160. DOI: 10.1109/VAST.2015.7347659.

6. Kaplan, A.*, Hare, E.*, **Hofmann**, **H.**, and Cook, D. (2014). "Can You Buy a President? Politics After the Tillman Act". In: *CHANCE* 27.1, pp. 20–30. DOI: 10.1080/09332480.2014.890866.

5. Rockoff, D.* and **Hofmann**, **H.** (2011). "How Good Is Your Eyeballing?" In: *CHANCE* 24.2, pp. 35–45. DOI: 10.1080/09332480.2011.10739861.

4. Mosley, L.*, Cook, D., **Hofmann**, **H.**, Kielion, C.*, and Schloerke, B.* (2010). "Monitoring the 2008 Election Visually". In: *CHANCE* 23.3. DOI: 10.1080/09332480.2010.10739812.

3. **Heike Hofmann** (2007). "Parallel Coordinate Plots". In: *Encyclopedia of Measurement and Statistics*. Ed. by Neil J.Salkind. Sage Publications 2007. DOI: 10.4135/9781412952644.

2. **Hofmann**, **H.** (2007a). "Interview with a Centennial Chart". In: *CHANCE* 20.2, pp. 26–35. DOI: 10.1080/09332480.2007.10722843.

1. — (2007b). "Mosaic Plots". In: *Encyclopedia of Measurement and Statistics*. Ed. by N. J.Salkind. Sage Publications 2007. DOI: 10.4135/9781412952644.

Submitted Papers

Topographic Images of Breech Face Impressions on Cartridge Case Primer Surfaces with Joe Zemmels*, Susan VanderPlas, and Alicia Carriquiry. Submitted to Scientific Data.

An explainable pipeline for machine learning with functional data with Katherine Goode, Derek J Tucker, and Daniel Ries. Submitted to Journal of Data Science, Aug 2025.

To be Submitted within the month

Visual Statistical Inference with Susan VanderPlas, and Rachel Rogers. Submitted to Wire International Reviews, Jan 2025.

Parallel Coordinate Plots for Mixed-Type Variables with Susan VanderPlas, and Matthias Schonlau. Submitted to Wire International Reviews, March 2025.

Talks

Invited

2025 **An ML? AI? Statistical(!) Approach — A Scientific Approach to the Common Source Problem in Firearms Evidence Evaluation**, *ISU-NISS conference AI in Statistics*, Ames, IA.

2025 **Interactive graphics - a look back and forward**, *Joint Statistical Meetings*, Nashville, TM.

2024 **ggplot2 extensions are easy – right?? (Inaugural Seminar)**, *Neb-RUG*, Lincoln, NE.

2024 **Enhancing Forensics through Innovation, Tools & Training**, *Forensics@NIST*, Online.

2024 **Using Visualizations for Policy Changes**, *Joint Statistical Meetings*, Portland, OR.

2024 **Tools for Firearms Comparisons**, *Center for Statistical Applications in Forensic Evidence*, All Hands Meeting, Washington, DC.

2023 **State of Firearm Comparisons**, *Center for Statistical Applications in Forensic Evidence*, All Hands Meeting, Ames, IA.

2023 **Data Visualizations: the why and the how, and many things to see**, *ISU Business Analytics Symposium*, Ames, IA.

2023 **Automatic Matching Algorithms**, *Nebraska Governance and Technology Center*, Lincoln, NE.

2021 **Two-Pronged Study of Bullets Fired by Consecutively Rifled Barrels**, *NIJ Forensic Technology Center of Excellence Firearm Webinar Series*, Online.

2021 **Drawing inference from lineups**, *Centro de Investigación en Matemáticas*, El Instituto Nacional de Estadística y Geografía, Online.

2021 **Scientific Advances in Toolmark Comparisons**, *6th Annual Questioning Forensics Conference*.

2020 **Machine Learning in Forensic Science**, *Joint Statistical Meetings*, Online.

2020 **Visualizing US Elections**, *Data Science, Statistics & Visualisation*, Online.

2020 **A framework for visual Inference**, *Symposium on Data Science and Statistics*, Online.

2019 **Immediate interactivity in statistical graphics**, *Directions of Statistical Computing*, Stanford University, Stanford, CA.

2019 **Bullet matching with machine learning methods**, *SimStat*, Vienna, Austria.

2019 **Lessons (To Be) Learned in Dynamic and Interactive Graphics**, *Joint Statistical Meetings*, Denver, CO.

2019 **Bullet matching with machine learning methods**, *NISS workshop on preventing gun violence*, Arlington, VA.

2019 **Visual Inference: leveraging the power of our eyes.**, *DAGstat*, Munich, Germany.

2018 **Visual Inference: leveraging the power of our eyes.**, *Statistics Department*, Carnegie Mellon University, Pittsburgh, PA.

2018 **A discussion of visual inference**, *Fields Institute*, Toronto, Canada.

2018 **Case validation studies for automatic bullet matching**, *Joint Statistical Meetings*, Vancouver, Canada.

2018 **Interactive graphics - then and now.**, *Symposium on Data Science and Statistics*, Baltimore, MD.

2017 **Visual Inference - Examples and Discussion**, *International Statistical Institute*, Marrakech, Morocco.

2016 **Visualization for IDA.**, *STRATOS initiative*, Banff, Canada.

2016 **Cutting-edge research in modern statistical sciences: Modern Tools and Impact in data science.**, *Joint Statistical Meetings*, Chicago, IL.

2016 **Visual Inference - Examples and Discussion.**, *Statistics Department*, Melbourne University, Melbourne, Australia.

2016 **Visual Inference - Examples and Discussion.**, *WEHI*, Melbourne, Australia.

2016 **Visual Inference - Examples and Discussion.**, *Statistics Department*, University of Technology Sydney, Sydney, Australia.

2016 **Matching Bullets**, *NUMBAT working group*, Monash University, Melbourne, Australia.

2016 **Visual Inference - Examples and Discussion**, *Econometrics & Business Statistics Department*, Monash University, Melbourne, Australia.

2016 **Clusters beat trend!? Testing feature hierarchy in statistical graphics.**, *WOMBAT conference*, Monash University, Melbourne, Australia.

2015 **Power and Significance of Visual Inference**, *Data Visualization & Exploration Tools*, Bio-IT World & Expo, Boston, MA.

2014 **Discussion of Graphical Inference**, *Chicago Chapter, American Statistical Association*, Chicago, IL.

2014 **Discussion of Graphical Inference**, *NORC*, Chicago, IL.

2013 **Redesigning the traditional Logo plot**, *BioVis*, Atlanta, GA.

2013 **Discussion of Graphical Inference**, *Meaningful Use of Complex Medical Data*, Los Angeles, CA.

2013 **Tools for Interactive Graphics**, *Census Bureau*, Washington, DC.

2013 **Painting a Picture of Life in the US - Statistics and the Census Bureau**, *Joint Statistical Meetings*, Montreal, Canada.

2013 **Graphical Inference**, *Interface Meeting*, Orange County, CA.

2013 **Discussion of Graphical Inference**, *Society for Technology in Anesthesiology Annual Meeting*, Scottsdale, AZ.

2012 **Interactive Graphic systems in R**, *SAMSI-FODAVA workshop on Interactive Visualization and Analysis of Massive Data*, Raleigh, NC.

2012 **Discussion of Graphical Inference**, *University of Chicago*, Chicago, IL.

2012 **Facing Off: Power of Visual and Classical Tests**, *Interface Meeting*, Houston, TX.

2012 **Can we say that something's there?**, *Augsburg University*, Augsburg, Germany.

2012 **Statistical Inference for Graphics**, *Information Visualization, Visual Data Mining and Machine Learning*, Dagstuhl Seminar 12081, Germany.

2012 **Statistics Course: Visual Communication**, *Miami University*, Oxford, OH.

2011 **Visual Inference (Best of Interface)**, *Joint Meeting of Taipei International Statistical Symposium and 7th Conference of the Asian Regional Section of the IASC*, Taipei, Taiwan.

2011 **Interactive Statistical Graphics for Data Exploration**, *Conference on Probability, Statistics, and Data Analysis*, IISA, Raleigh, NC.

2011 **Main Direction for Rotation Matrices**, *Augsburg University*, Augsburg, Germany.

2010 **Inference for Graphical Displays**, *Workshop on Extreme Scale Visual Analytics*, Salt Lake City, UT.

2010 **Let the Data Figure!**, *Interface Meeting*, Seattle, WA.

2010 **Body Composition- Statistical Vantage Point**, *NRWC Workshop*, Ames, IA.

2010 **Let the Data Figure!**, *Antony Unwin's 60th Birthday*, Augsburg, Germany.

2009 **Graphical Exploration of Very Large Data**, *Army Conference on Applied Statistics*, Tempe, AZ.

2009 **Visual Assessment of Airline Carriers**, *EURISBIS '09*, Sardinia, Italy.

2009 **Incorporating Interactive graphics into Metabolomics Data Pre-processing**, *ENAR*, San Antonio, TX.

2008 **Visualizing Large Data**, *Large Data Vis Conference*, Bremen, Germany.

2008 **Visualization of Categorical Data**, *Augsburg University*, Augsburg, Germany.

2007 **Statistical Lessons learned from the Netflix Challenge**, *Winona State University*, Winona, MN.

2007 **Scagnostics for Projection Pursuit**, *University of Iowa*, Iowa City, IA.

2007 **Longitudinal Data in R**, *useR! Conference*, Ames, IA.

2007 **Scagnostics for Projection Pursuit**, *Joint Statistical Meetings*, Salt Lake City, UT.

2007 **Modeling Massive Data Sets: The Netflix Challenge from a Statistical Perspective**, *Spring Research Conference*, Iowa State University, Ames, IA.

2007 **Scagnostics for Projection Pursuit**, *ENAR*, Atlanta, GA.

2006 **Variations of Mosaic plots**, *CSC Conference: Workshop on Data and Information Visualization 2006*, Berlin, Germany.

2006 **Variations of Mosaic plots**, *Compstat 2006*, Rome, Italy.

2005 **Boom and Bust of High-Tech Industry at the turn of the Millenium - Data Challenge**, *InfoVis*, Minneapolis, MN.

2004 **Interactive biplots for visual modelling**, *Compstat 2004*, Prauge, Czech Republic.

2003 **How to visuallize a million bins**, *Joint Statistical Meetings*, San Francisco, CA.

2003 **How to visuallize a million bins**, *International Meeting of the Psychometric Society*, Cagliari, Italy.

2003 **Graphics - an Ace up a Statistician's Sleeve**, *WNAR*, President's Invited Address, Golden, CO.

2003 **Graphical Opportunities in Exploring Microarray Data**, *Toxicogenomics: Through the Eyes of Informatics, organized by the Virginia Bioinformatics Institute and NIEHS*, Washington, DC.

2002 **How to visualize a million bins**, *3rd Workshop of Data Visualisation*, Rain am Lech, Germany.

2001 **How to visualize a million points**, *University of Augsburg*, Augsburg, Germany.

2001 **Mosaics, Mosaics, and Mosaics**, *2nd Workshop of Data Visualisation*, Washington, DC.

2001 **Generalized Odds Ratios for Visual Modelling**, *AT&T Research Labs*, Florham Park, NJ.

2001 **Generalized Odds Ratios for Visual Modelling**, *Iowa State University*, Ames, IA.

2001 **Generalized Odds Ratios for Visual Modelling**, *University of Wisconsin*, Madison, WI.

2000 **Do you know your feelings? A statistical analysis of linguistic data**, *International Symposium on Data Mining & Statistics*, Augsburg, Germany.

2000 **Generalized Odds Ratios for Visual Modelling**, *Iowa State University*, Ames, IA.

2000 **MANET - an interactive graphical system**, *Cambridge University*, Cambridge, United Kingdom.

2000 **Interactive Statistical Graphics**, *CWI Amsterdam*, Amsterdam, The Netherlands.

1999 **GUI and Command-line - Conflict or Synergy?**, *Interface Symposium*, Chicago, IL.

1998 **Mosaicplots in an interactive graphical system**, *Yale University*, New Haven, CT.

1998 **Visualising and Working with Categorical Data**, *Lucent Technologies*, Chicago, IL.

1998 **Visualising and Working with Categorical Data**, *Visual Insight*, Chicago, IL.

1997 **MANET - an interactive graphical system**, *AT&T Research Labs*, Florham Park, NJ.

1997 **Can we see what is not there? Exploring and keeping track of missings**, *Joint Statistical Meetings*, Anaheim, CA.

Invited Poster

2013 **Redesigning the traditional Logo plot**, *BioVis*, CA.

2012 **How good is your Eyeballing?**, *Joint Statistical Meetings*, San Diego, CA.

Refereed Conference

2005 **Visual Modeling with Mosaic Plots**, *Interface Meeting*, Saint Louis, MO.

2003 **Visualizing Conditional Distributions**, *Annual meeting of the German Society of Statistical Computing*, Reisensburg, Germany.

2003 **Visualizing Conditional Distributions**, *Interface Meeting*, Salt Lake City, UT.

2002 **Visualizing Simple Association Models**, *Compstat*, Berlin, Germany.

2002 **Visualizing Conditional Distributions**, *Annual meeting of the Gesellschaft für Klassifikation (German Classification Society)*, Mannheim, Germany.

2001 **Visualization of Association Rules**, *Interface Symposium*, Santa Ana, CA.

1999 **Visualisation in Data Mining -Screening Multivariate Categorical Data**, *International Statistical Institute*, Helsinki, Finland.

1998 **Interactive Biplots**, *New Techniques and Technologies for Statistics*, Sorrent, Italy.

Software

Dates show initial involvement; only packages which are no longer maintained have end dates.

2022 — **cmpsR**, *An implementation of the Congruent Matching Profile Segments (CMPS) method (on CRAN).*
https://github.com/willju-wangqian/cmpsR

2021 — **ggpcp**, *Generalized parallel coordinate plots (on CRAN).*
https://github.com/heike/ggpcp

2019 — **cmcR**, *Analysis of cartridge cases (on CRAN).*
https://github.com/CSAFE-ISU/cmcR

2019–2021 — **groovefinder**, *Finding grooves in 3D bullet land cross-sections .*
https://github.com/heike/groovefinder

2018 — **x3ptools**, *Working with x3p files in R (on CRAN).*
https://github.com/heike/x3ptools

2018 — **toolmaRk**, *Toolmark analysis in R (on CRAN).*
https://github.com/heike/toolmaRk

2018 — **bulletxtrctr**, *Analysis of bullet land 3d topographical scans .*
https://github.com/heike/bulletxtrctr

2017 — **qqplotR**, *QQ plots variations in R (on CRAN).*
https://cran.r-project.org/web/packages/qqplotr/vignettes/introduction.html

2016 — **ggmosaic**, *Mosaic plots in R within the ggplot2 framework (on CRAN).*
https://github.com/heike/ggmosaic

2016–2023 — **eechidna**, *Exploring Election and Census Highly Informative Data Nationally for Australia (on CRAN).*
https://github.com/jforbes14/eechidna

2016 — **lvplot**, *Letter-value boxplots in R (on CRAN).*
https://cran.r-project.org/web/packages/lvplot/index.html

2015 — **bulletr**, *Analysis of bullet land 3d topographical scans (on CRAN).*
https://github.com/heike/bulletr

2015–2021 — **geomnet**, *Visualization of network data (on CRAN).*
https://github.com/sctyner/geomnet

2014–2022 — **gglogo**, *Sequence logo plot visualization (on CRAN).*
https://github.com/heike/gglogo

2014–2020 — **MergeGUI**, *A GUI for Merging Datasets in R (on CRAN).*
https://cran.r-project.org/web/packages/MergeGUI/index.html

2014 — **nullabor**, *Package to support visual inference (on CRAN).*
https://github.com/dicook/nullabor

2013 — **vinference**, *Analysis of visual inference experiments (on CRAN).*
https://github.com/heike/vinference

2013 — **peptider**, *R package for working with peptide libraries (on CRAN).*
https://github.com/heike/peptider

2013 — **discreteRV**, *Create, manipulate, transform, and simulate from discrete random variables. (on CRAN).*
https://cran.r-project.org/web/packages/discreteRV/index.html

2013 **rotations**, *Working with Rotation Data (on CRAN).*
https://github.com/stanfill/rotationsC

2013 **chromatoplots**, *A pipeline-based R package for the pre-processing of GC-MS metabolomics data (on Bioconductor).*
https://rdrr.io/github/tengfei/chromatoplots/

2012 **ggboxplots**, *Boxplots with ggplot* .
https://github.com/heike/ggboxplots

2012 **ggparallel**, *Create hammock plots in R (on CRAN).*
https://github.com/heike/ggparallel

2012 **dbData**, *Database Access for Sufficient Statistics of Data Graphics* .
https://github.com/heike/dbData

2011 **dbConnectGUI**, *Provides a simple GUI for connecting to and exploring MySQL databases.* .
https://github.com/Dasonk/dbConnectGUI

2011 **HLMDiag**, *A suite of diagnostic tools for hierarchical (multilevel) linear models. (on CRAN).*
https://cran.r-project.org/web/packages/HLMdiag/index.html

2010 **productplots**, *Framework for visualising tables of counts, proportions and probabilities (on CRAN).*
https://github.com/hadley/productplots/commits/master/

2005–2014 **cranvas**, *Interactive visualization in R* .
https://github.com/ggobi/cranvas

1995 **ggobi**, *Basic implementation of area charts (histograms, bar charts)* .
http://www.ggobi.org

1993–2007 **MANET**, *Interactive visualization* .
http://www.rosuda.de/manet

Teaching

Classes

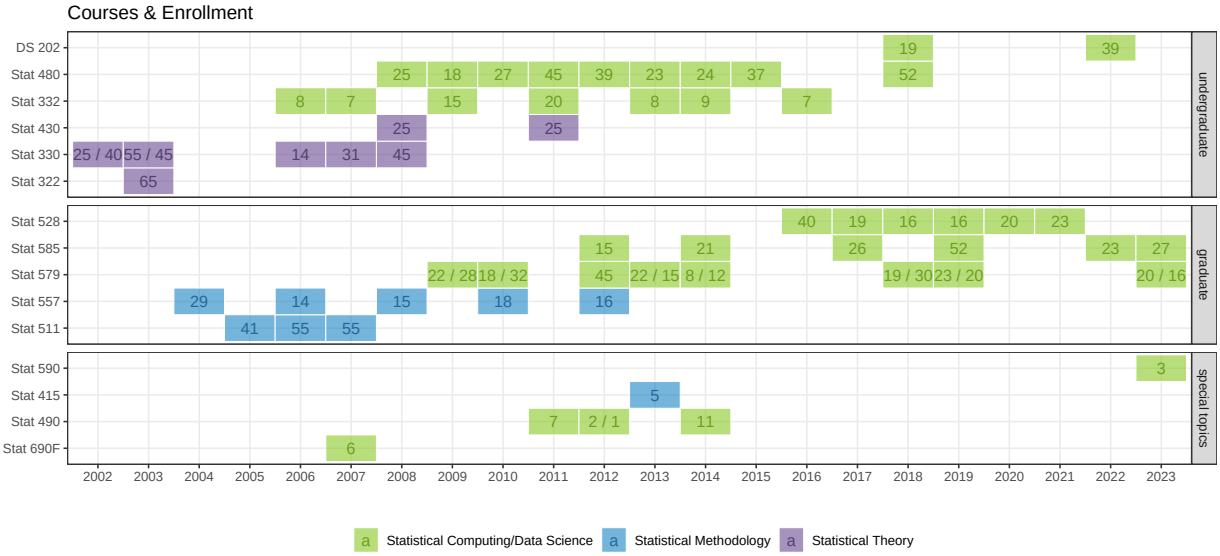
2025 **Stat 251**, *Statistical Computing I: Data Wrangling*, Enroll: 7.

2025 **Stat 471**, *Analysis of Messy Data*, Enroll: 12.

2024 **Stat 850**, *Computing Tools for Statisticians*, Enroll: 19, Eval: ? (11/18).

2024 **Stat 810**, *Alpha Seminar*, Enroll: 11, Eval: ? (6/11).

Classes at ISU



Course Development

2025 **Stat 471**, *Analysis of Messy Data*, New course, required capstone course for the Statistics Major. Material covers data normal forms, formalizing data type and range requirements, identifying outliers, dealing with missing values and structures, record linkage..

2018 **DS 202**, *Data Acquisition and Exploratory Data Analysis.*, Developed new course. Required class for the minor and major in the DS program..

2018 **Stat 480**, *Applied Statistical Computing*, Change of material to streamline with new material in Stat 479.

2016 **Stat 528**, *Visual Business Analytics*, online-only course, prep time 1000h (one-thousand, not a typo), students pre-req is enrollment in the Master of Business Analytics. It would make sense to change that pre-requisite to all students from graduate programs outside of statistics..

2012–2023 **Stat 585**, *Data Technologies in Statistics*, initially with D. Cook, now by myself: this course is going over methods and tools for good practices in statistical computing. This has been an area of rapid advancements over the last ten years, making rather deep changes to the material necessary for each course iteration. Team-taught with S. VanderPlas in 2019..

2011 **Stat 490**, *Data Visualization Competition for the DOT*, 2 projects for DOT challenge: visualizing transportation data safety (6 students), visualization of state regulations regarding DUI convictions and effects on rate of fatal accidents. Economics (1 student): visualization of effect of wind patterns on efficiency of airports.

2009–2014 **Stat 579**, *Introduction to Statistical Computing*, re-worked and extended material taught: data centered modules with lab components with a strong emphasis on working with real (and occasionally large) data and problem solving techniques..

2008–2011 **Stat 430**, *Statistics for Computer Scientists*, with Bill Duckworth: statistics for CS graduate students (first taught in Spring 2006 by Arka Ghosh); by now this course has evolved to serve entry-level graduate students from BCB, Computer Science and Computer Engineering..

2007 **Stat 690F**, *Special Topics in Statistical Graphics*, with D. Cook, reading-based course on statistical graphics. We have been discussing a wide range of statistical graphics: visual perception, statistical testing of effective displays, multidimensional graphics, interactive statistical graphics, elements of data exploration, grand tours and projection pursuit..

2006

Stat 503, *Exploratory Methods and Data Mining*, Added material on categorical data: measures of associations and use in algorithms, such as association rules. Added material on large databases..

2006
2016

Stat 332, *Visual Communication of Quantitative Information*, with D. Cook and Charles Kostelnick (English): undergraduate course (with graduate credit), team-taught for the first time in Spring 2006.

Mentoring and Advising

PhD

2025 **Beenu Sareena Wanni Arachchige**, *University of Nebraska-Lincoln*.

2024 **Muxin Hua**, *University of Nebraska-Lincoln*, with Susan VanderPlas.

2024 **Carson Trego**, *University of Nebraska-Lincoln*.

2023 **Marie Hardt**, *Iowa State University*, with Shauna Hallmark, Alicia Carriquiry.

2022 **Yuhang (Tom) Lin**, *Iowa State University*, with Alicia Carriquiry.

2021 **Wangqian (Will) Ju**, *Iowa State University*, with Alicia Carriquiry.

2017 **Ganesh Krishnan**, *Iowa State University*, with Alicia Carriquiry.

2020
2024 **Yawei Ge**, *Iowa State University*, with Yumou Qiu.

2020
2023 **Joseph Zemmels**, *Iowa State University*, with Susan VanderPlas, UNL.

2017
2021 **Haley Jeppson**, *Iowa State University*, Dr. Jeppson is Visiting Assistant Professor in the Department of Statistics at the University of Iowa.

2016
2021 **Katherine Goode**, *Iowa State University*.

2016
2020 **Xiaodan Liu**, *Iowa State University*, with Emily Berg.

2016
2019 **Natalia Acevedo-Luna**, *Iowa State University*, with Geetu Tuteja.

2015
2020 **Kiegan Rice**, *Iowa State University*, with Ulrike Genschel.

2015
2017 **Samantha Tyner**, *Iowa State University*.

2014
2017 **Natalia da Silva**, *Iowa State University*, co-advisor: Di Cook. Dr. da Silva is Assistant Professor in the Department of Statistics at the Universidad de la República in Montevideo.

2014
2017 **Eric Hare**, *Iowa State University*, Dr. Hare is the Chief Data Scientist at OmniAnalytics.

2013
2016 **Carson Sievert**, *Iowa State University*.

2012
2015 **Karsten Maurer**, *Iowa State University*, Dr. Maurer went to a tenure track position at Miami University, OH..

2011
2015 **Susan VanderPlas**, *Iowa State University*, Dr. VanderPlas is Assistant Professor at the University of Nebraska Lincoln.

2010
2014 **Niladri Roy Chowdhury**, *Iowa State University*, co-advisor: D. Cook. Dr. Roy Chowdhury is working for Novartis Inc in New Jersey..

2009–2013 **Yihui Xie**, *Iowa State University*, co-advisor: D. Cook. Dr. Xie was a Software Engineer at RStudio, Inc/Posit until 2023. He is the author of the R packages knitr and rmarkdown, which have been transformative in that both he and Dr. Wickham have been mentioned by name in David Donoho's white paper on '50 years of Data Science' as having large impact on the community: "This effort may have more impact on today's practice of data analysis than many highly-regarded theoretical statistics papers." (Donoho, 2015).

2009–2013 **Mahbub Majumder**, *Iowa State University*, co-advisor: D. Cook. Dr. Majumder is an Associate Professor of Statistics in the Department of Mathematics at the University of Nebraska at Omaha..

2009–2013 **Marie Vendettuoli**, *Iowa State University*, co-advisors: D. Cook, Eve Wurtele. Dr. Vendettuoli is a Computer Scientist at USDA.

2009–2013 **Adam Loy**, *Iowa State University*, Dr. Loy is Associate Professor of Statistics in the Department of Mathematics and Statistics at Carleton College, MN..

2004–2008 **Hadley Wickham**, *Iowa State University*, co-advisor: D. Cook. Dr. Wickham is Chief Scientist at RStudio/Posit, PBC. He is a member of the R Foundation and currently serves as the President of the R Consortium.He is an Honorary Professor of Statistics at Auckland University. He has been elected a Fellow of the American Statistical Association in 2015. He won the COPSS award in 2019. His work is hugely influential among the statistical computing community: he authored six of the top ten R packages in 2015; each of these packages was downloaded at least 400,000 times..

MS

2024–2025 **Azizul Islam**, *Iowa State University*, with Ulrike Genschel.

2021 **Wangqian Ju**, *Iowa State University*.

2021 **Charlotte Roiger**, *Iowa State University*.

2020 **Yawei Ge**, *Iowa State University*.

2020 **Joseph Zemmels**, *Iowa State University*.

2020 **Eryn Blagg**, *Iowa State University*.

2018 **Taikgun Song**, *Iowa State University*.

2017 **Kiegan Rice**, *Iowa State University*, with Dan Nordman.

2017 **Joe Papio**, *Iowa State University*, with David Peterson, Political Science.

2015 **Sam Helmich**, *Iowa State University*, with Ulrike Genschel.

2015 **Samantha Tyner**, *Iowa State University*.

2014 **Krisoye Smith**, *Iowa State University*, with Ulrike Genschel.

2014 **Alex Shum**, *Iowa State University*.

2014 **Eric Hare**, *Iowa State University*, with Ulrike Genschel.

2014 **Andee Kaplan**, *Iowa State University*.

2014 **Lendie Follett**, *Iowa State University*.

2013 **Takisha Harrison**, *Iowa State University*.

2013 **Carson Sievert**, *Iowa State University*.

2012 **Dason Kurkievicz**, *Iowa State University*.

2011 **Karsten Maurer**, *Iowa State University*.

2011 **Bryan Stanfill**, *Iowa State University*.

2010 **Xiang Wu**, *Iowa State University*.

2010 **Yunhui Cao**, *Iowa State University*.

2010 **David Rockoff**, *Iowa State University*.

2009 **Adam Loy**, *Iowa State University*.

2009 **Danielle Wrolstad**, *Iowa State University*.

2008 **Rachel Graham**, *Iowa State University*.

2007 **Dominik Birkmeier**, *Iowa State University*.

2007 **Aimin Yan**, *Iowa State University*.

2006 **Jie Zhu**, *Iowa State University*.

2006 **Hong Bai**, *Iowa State University*.

2006 **Junjie Sun**, *Iowa State University*.

2005 **Suzanna Stevens**, *Iowa State University*.

2005 **Jeff Thostenson**, *Iowa State University*.

2004 **Lifeng You**, *Iowa State University*.

Professional Practice

Visualization of Biological Data in R

2.5 day workshop at SISBID

2025 **with D. Cook, S. Vanderplas**, *Online*.

2024 **with D. Cook, S. Vanderplas**, *Online*.

2023 **with D. Cook, S. Vanderplas**, *Online*.

2022 **with D. Cook, S. Vanderplas**, *Online*.

2021 **with D. Cook**, *Online*.

2020 **with D. Cook**, *Online*.

2019 **with D. Cook**, *Seattle, WA*.

2018 **with D. Cook**, *Seattle, WA*.

2017 **with D. Cook**, *Seattle, WA*.

2016 **with D. Cook**, *Seattle, WA*.

Machine Learning for Forensic Practitioners

6h workshop at Center for Statistics and Applications in Forensic Evidence

2023 **3 sessions of 2h each**, *Online*.

Scans to Scores – a discussion of the process from 3d topographic scans to similarity scores

4h workshop at International Association for Identification

2022 **HH**, *Omaha, NE*.

Randomforests: properties and limitations / same gun or different gun? - Quantifying the Similarity Between Bullet Striations

4h workshop at American Academy Of Forensic Science

2020 **with Alicia Carriquiry and Jeff Salyards**, *Anaheim, CA*.

Intro to R, Visualizing Data

6h workshop at Midwest Big Data Summer School

2018 **HH**, *Iowa State University, Ames, IA*.

2017 **HH**, *Iowa State University, Ames, IA*.

2016 **HH**, *Iowa State University, Ames, IA*.

Statistical methodology in firearm examination

1.5 day workshop at Center for Statistics and Applications in Forensic Evidence

2018 **Workshop to train Firearm and toolmark examiners on statistical methodology, introduce participants to the lab facilities on the ISU campus of CSAFE, and provide details on automatic matching (and some of its limitation). 8 FTEs from different locations (Houston FSI, St Louis PD, Denver PD, and Virginia PD) attended the workshop, as well as our technical advisor Alan Zheng from NIST**, *Ames, IA*.

R Workshop series

2017 **5 day workshop at Iowa State University** with graduate students: Haley Jeppson, Joe Papio, Sam Tyner, *Ames, IA*.

2016 **5 day workshop at Iowa State University** with graduate students: Eric Hare, Andee Kaplan, Sam Tyner, *Ames, IA*.

2015 **5 day workshop at Iowa State University** with graduate students: Eric Hare, Andee Kaplan, Carson Sievert, *Ames, IA*.

2014 **evening classes workshop at Iowa State University** with graduate students: Karsten Maurer, Carson Sievert, Susan Vanderplas, Eric Hare, *Ames, IA*.

2014 **4 day workshop at Iowa State University** with graduate students: Karsten Maurer, Susan Vanderplas, Eric Hare, *Ames, IA*.

2013 **4 day workshop at Iowa State University** with graduate students: Karsten Maurer, Susan Vanderplas, Eric Hare, *Ames, IA*.

2013 **5 day workshop at Iowa State University** with graduate students: Adam Loy, Karsten Maurer, Susan Vanderplas, *Ames, IA*.

2012 **5 day workshop at Iowa State University** with graduate students: Adam Loy, Karsten Maurer, Dason Kurkievicz, *Ames, IA*.

Graphics in R

1 day workshop at Miami University

2012 **HH**, *Oxford, OH*.

Graphics in R and ggobi

1 day workshop at IEEE InfoVis

2012 **with D. Cook, Winston Chang, Yihui Xie**.

Visualization of Climate Data

5 day workshop at SARMA/Ties workshop

2011 **with H. Wickham and D. Cook**, *Reykjavik, Iceland*.

Looking at Data

1 day workshop at Joint Statistical Meetings

2009 **with H. Wickham and D. Cook**, *Washington, DC*.

Visualizing Data with R

4h workshop at Iowa State University

2009 **with D. Cook**, *Ames, IA*.

Graphics of Large Datasets

1 day workshop at Joint Statistical Meetings

2008 **with Antony Unwin**, *Denver, CO*.

2007 **with Antony Unwin**, *Salt Lake City, UT*.

Visualizing Multivariate Data

2 day workshop at ASA Alaska

2003 **with D. Cook**, *Alaska*.

Visual Data Mining

1 day workshop at Joint Statistical Meetings

2000 **HH**, *Indianapolis, IN*.

Graphical Methods for Categorical Data

1 day workshop at Interface Meeting

1999 **with Antony Unwin**, *Chicago*.

Service

Committee

2022 **Women Impacting ISU Selection Committee**.

2019–2022 **VPR Internal Funding Proposal Evaluation Committee**.

2019 **Chair Search Committee**.

2017 **VPR committee member for internal review of the Virtual Reality Applications Center**.

2016–2024 **University Curriculum Advisory Board for Data Science**.

2016–2017 **LAS Development Committee for Major in Data Science**.

2015–2020 **LAS P&T Committee**.

Conference Organization

2020 **Analysis and interpretation of bullet and cartridge case evidence using 3D technologies, two day NIST Center of Excellence workshop**, *2 day NIST Center of Excellence workshop at Iowa State (with Alicia Carriquiry).*

2015 **Interface session: Interactive Graphics in R**.

2013 **Painting a picture of the United States session organizer, invited session, JSM 2013**.

2013 **Data Expo '13: Soul of the Community**.

2012 **Man AND Machine: the Conversation using the language of interactive graphics, session organizer, invited session, Interface 2012**.

2011 **Advances in Statistical Graphics topic-contributed session organizer, JSM 2011**.

2008 **Dealing with Large Data session organizer, invited session, JSM 2008**.

2006 **Program Committee Member, 4th International Conference on Coordinated & Multiple Views in Exploratory Visualization (CMV2006), July 4, London, UK**.

2002 **Discrete Data session organizer, JSM 2002**.

2002 **Member of the Organizing Committee: Third International Workshop on Data Visualization for large data sets and Data Mining, October 6 - 9, 2002, Augsburg, Germany.**.

2000 **Member of the Organizing Committee: International Symposium on Data Mining and Statistics, November 20-21, 2000, University of Augsburg, Germany.**.

Department Committee

2024 **Seminar Chair**.

2019–2024 **Data Science Curriculum Advisory Board**, *chair since 2020.*

2019 **Ad Hoc Committee for Improving Statistics MS and PhD Exam Procedures**.

2019 **Search Committee (CSAFE)**.

2018–2024 **Computation Advisory Committee**.

2018–2024 **Honors and Awards Committee**.

2017 **Search Committee**.

2017 **Search Committee (CSAFE)**.

2015–2018 **Advisory Committee on Tenure and Promotion**, *chair Fall 2017 - Spring 2018.*

2015–2017 **P&T Committee**, *chair in 2017.*

2014 **Search Committee (joint w/ Political Science)**.

2012–2013 **Computation Advisory Committee**, *chair Fall 2009-Spring 2011.*

2012 **Search Committee (joint w/ Computer Science)**.

2011–2015 **Student/Faculty Committee on Instruction**.

2011–2013 **Admissions Committee**.

2011–2012 **Curriculum Committee**.

2011–2012 **Library**.

2008–2015 **Undergraduate Committee**.

2008–2009 **Diversity Committee**.

2008 **Search Committee**.

2007 **Search Committee**.

2005–2010 **MS Exam Question**.

2005–2007 **MS Exam Committee**.

2005 **Social Committee**.

2003–2005 **Graduate Admission**.

2003 **Search Committee**.

Discipline

2026 **ASA Statistical Graphics Past Chair**.

2025 **ASA Statistical Graphics Chair**.

2024 **ASA Statistical Graphics Chair Elect**.

2024 **NIJ Panel Member**.

2023 **NIJ Panel Member**.

2022–2024 **ASA Advisory Committee on Forensic Science**.

2021 **Ad-hoc reviewer for the French Science Foundation (one proposal)**.

2019 **External Reviewer for Doctoral Thesis**.

2018 **Student Paper Competition Award Committee, ASA Section on Statistical Graphics and Statistical Computing**.

2017–2023 **Board Member, Interface**, *Interface dissolved 2023*.

2017 **Ad-hoc reviewer for the Belgian Science Foundation (one proposal)**.

2013–2023 **InfoVis Program Committee**.

2013 **NSF Panel Member**.

2013 **ASA Statistical Graphics Past Chair**.

2012–2014 **Board Member, Interface**.

2012 **Reviewer for Austrian Science Foundation**.

2012 **ASA Statistical Graphics section Chair**.

2011 **ASA Statistical Graphics Chair Elect**.

2011 **Judge, NSF IGERT Poster Competition**, *Ranked 20 poster contributions*.

2010 **ASA Statistical Graphics Program Chair**.

Justice

2023 **Written Testimony to the Federal District Court – Northern District of Florida (Pensacola), Assessment of the Reliability of Studies of Firearms Examination in Forensics, filed in US v. Quinton Pete 3:22cr48/TKW**, *with Susan Vanderplas*.

2022 **Written Testimony to the Cook County Circuit Court, Reply to Response by FBI Laboratory filed in Illinois v. Winfield and Affidavit by Biederman et al. filed in US v. Kaevon Sutton (2018 CF1 009709)**, *with Susan Vanderplas, Kori Khan, Alicia Carriquiry*.

2021 **Written Testimony to the Cook County Circuit Court, Assessment of the Reliability of Studies of Firearms Examination in Forensics**, *with Susan Vanderplas, Kori Khan, Alicia Carriquiry*.

2020 **Witness to Hon. April A. Newbauer, Acting Justice of the NY State Supreme Court Criminal Term in New York City, on firearm toolmark analysis**.

Refereeing and Editing

2014 **Guest Editor of the Computational Statistics' special issue on Soul of the Community**.

2002–2005 **Associate Editor, Journal of Computational and Graphical Statistics**.

2002–2004 **Associate Editor, Computational Statistics**.

2001 **Co-Editor, "Graphics for Large Datasets"**.

2001 **Guest Editor of the Computational Statistics special issue on Data Mining and Statistics, vol. 16 (3), 2001.**.

2000– **Referee for book and book chapters (Springer, Chapman &Hall), and journal submissions (JCGS, TAS, CSDA, JSS, R Journal, TCGV, Bioinformatics, ...)**.