

Susan Vanderplas

Curriculum Vitae

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🌐 [srvanderplas](https://srvanderplas.github.io)

Education

- 2015 • **PhD, Statistics**, Iowa State University
Dissertation: The Perception of Statistical Graphics
- 2011 • **MS, Statistics**, Iowa State University
- 2009 • **BS, Psychology & Applied Mathematical Sciences**, Texas A&M University

Professional Experience

- 2020 • **Assistant Professor**, *Statistics Department*, University of Nebraska, Lincoln
- 2018 • **Research Assistant Professor**, *Center for Statistics and Applications in Forensic Evidence*, Iowa State University
- 2018 • **Statistical Consultant**, *Nebraska Public Power District*
Provided individual mentoring and project leadership to continue the Business Intelligence Embedded Agent program and provide support for R-related projects.
- 2015-2018 • **Statistical Analyst**, *Nebraska Public Power District*
- 2015 • **Postdoc**, *Iowa State University Office of the Vice President for Research*

Scholarship

Contribution percentages estimated from git contributions using `git flame` where possible. Not all projects have github repositories for which this is meaningful.

Journal Publications

15. 2021 • Submitted as an invited response to Hullman & Gelman's "Designing for Interactive Exploratory Data Analysis Requires Theories of Graphical Inference".
VanderPlas, Susan (July 30, 2021). "Designing Graphics Requires Useful Experimental Testing Frameworks and Graphics Derived from Empirical Results". In: *Harvard Data Science Review*. <https://hdsr.mitpress.mit.edu/pub/m7ur7k3u>. DOI: [10.1162/99608f92.7d099fd0](https://doi.org/10.1162/99608f92.7d099fd0). URL: <https://hdsr.mitpress.mit.edu/pub/m7ur7k3u>.
14. 2021 • Hofmann, Heike, **Susan Vanderplas**, and Alicia Carriquiry (June 2021). "Treatment of inconclusives in the AFTE range of conclusions". en. In: *Law, Probability and Risk* 19.3-4, pp. 317-364. DOI: [10.1093/lpr/mgab002](https://doi.org/10.1093/lpr/mgab002). URL: <https://academic.oup.com/lpr/article/19/3-4/317/6308611> (visited on 12/20/2021).
Contribution: Writing (50%).
13. 2021 • **VanderPlas, Susan**, Christian Röttger, Dianne Cook, and Heike Hofmann (2021). "Statistical significance calculations for scenarios in visual inference". In: *Stat* 10.1, e337. DOI: <https://doi.org/10.1002/sta4.337>.
Contribution: Programming and analysis (30%), Writing (65%).

12. 2020

Vanderplas, Susan, Alicia Carriquiry, Heike Hofmann, James Hamby, and Xiao Hui Tai (2020). "An introduction to firearms examination for researchers in statistics". In: *Handbook of Forensic Statistics*. Ed. by Banks, D., Kafadar, K., Kaye, D., and Tackett, M. New York: Chapman and Hall/CRC 2020. DOI: [10.1201/9780367527709](https://doi.org/10.1201/9780367527709).
Contribution: Writing (50%).
11. 2020

Vanderplas, Susan, Melissa Nally, Tylor Klep, Cristina Cadevall, and Heike Hofmann (Jan. 2020). "Comparison of three similarity scores for bullet LEA matching". In: *Forensic Science International*. DOI: [10.1016/j.forsciint.2020.110167](https://doi.org/10.1016/j.forsciint.2020.110167).
Contribution: Programming and analysis (20%), Writing (55%).
10. 2020

Vanderplas, Susan, Dianne Cook, and Heike Hofmann (Mar. 2020). "Testing Statistical Charts: What Makes a Good Graph?" In: *Annual Review of Statistics and Its Application* 7.1, pp. 13.1–13.28. DOI: [10.1146/annurev-statistics-031219-041252](https://doi.org/10.1146/annurev-statistics-031219-041252).
Contribution: Writing (85%).
9. 2019

Rutter, Lindsay, **Susan VanderPlas**, Dianne Cook, and Michelle Graham (2019). "gge-nealogy: An R Package for Visualizing Genealogical Data". In: *Journal of Statistical Software* 89.13, pp. 1–31. ISSN: 1548-7660. DOI: [10.18637/jss.v089.i13](https://doi.org/10.18637/jss.v089.i13).
8. 2019

VanderPlas, Susan, Ryan Goluch, and Heike Hofmann (2019). "Framed! Reproducing and Revisiting 150 year old charts". In: *Journal of Computational and Graphical Statistics*. DOI: [10.1080/10618600.2018.1562937](https://doi.org/10.1080/10618600.2018.1562937).
Contribution: Programming and analysis (60%), writing (50%).
7. 2019

Sievert, Carson, **Susan VanderPlas**, Jun Cai, Kevin Ferris, Faizan Uddin Fahad Khan, and Toby Dylan Hocking (2019). "Extending ggplot2 for linked and animated web graphics". In: *Journal of Computational and Graphical Statistics* 28.2, pp. 299–308. DOI: [10.1080/10618600.2018.1513367](https://doi.org/10.1080/10618600.2018.1513367).
6. 2017

Vanderplas, Susan and Heike Hofmann (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](https://doi.org/10.1080/10618600.2016.1209116).
Contribution: Programming and analysis (90%), writing (50%).
5. 2017

Submitted as an invited response to Donoho's "50 years of Data Science".
Hofmann, Heike and **Susan Vanderplas** (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](https://doi.org/10.1080/10618600.2017.1385474).
Contribution: Writing (75%).
4. 2016



Vanderplas, Susan and Heike Hofmann (2016). "Spatial Reasoning and Data Displays". In: *IEEE Transactions on Visualization and Computer Graphics*. DOI: [10.1109/TVCG.2015.2469125](https://doi.org/10.1109/TVCG.2015.2469125).
Contribution: Programming and analysis (90%), writing (75%).
3. 2015

— (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](https://doi.org/10.1080/10618600.2014.951547).
Contribution: Programming and analysis (50%), writing (60%).
2. 2010

Towfic, Fadi, **Susan VanderPlas**, Casey A Oliver, Oliver Couture, Christopher K Tuggle, M Heather West Greenlee, and Vasant Honavar (2010). "Detection of gene orthology from gene co-expression and protein interaction networks". In: *BMC bioinformatics* 11.Suppl 3, S7. DOI: [10.1186%2F1471-2105-11-S3-S7](https://doi.org/10.1186%2F1471-2105-11-S3-S7).
1. 2009

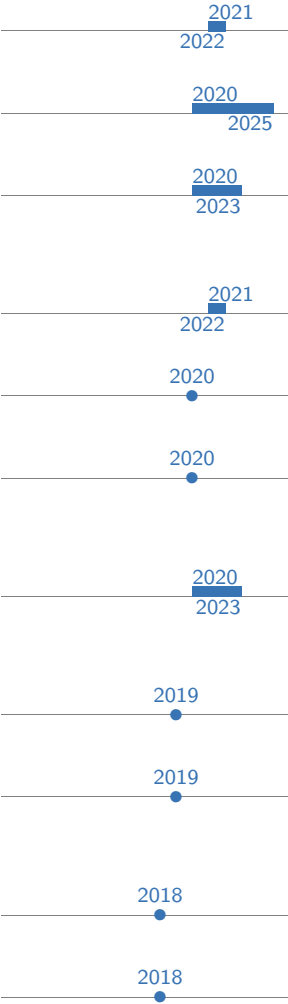
Hull, Rachel, Heather Bortfeld, and **Susan Koons** (2009). "Near-infrared spectroscopy and cortical responses to speech production". In: *The open neuroimaging journal* 3, p. 26. DOI: [10.2174%2F1874440000903010026](https://doi.org/10.2174%2F1874440000903010026).

Other Publications


2.  Carriquiry, Alicia, Heike Hofmann, Xiao Hui Tai, and **Susan VanderPlas** (2019). "Machine learning in forensic applications". In: *Significance* 16.2, pp. 29–35. DOI: [10.1111/j.1740-9713.2019.01252.x](https://doi.org/10.1111/j.1740-9713.2019.01252.x).
Contribution: Writing (50%).
1.  Budrus, Sarah, Susan Vanderplas, and Dianne Cook (2013). "In tennis, do smashes win matches?" In: *Significance* 10.3, pp. 35–38. DOI: [10.1111/j.1740-9713.2013.00665.x](https://doi.org/10.1111/j.1740-9713.2013.00665.x).

In Progress **Perception of Log Scales** Assessment of perception and use of log scales to display exponential growth. Data collection stage.
A Convolutional Neural Network for Outsole Recognition Use CNNs to automate identification of class characteristics in images of footwear outsoles. Revision stage.
Bullet Signature Resampling Method for resampling bullet signatures used to calculate match and non-match score distributions.

Grants

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- NIJ R&D in Forensic Science**, *Automatic Acquisition and Identification of Footwear Class Characteristics*, PI, Funded, \$380,650 total
 - NIST**, *Center for Statistics and Applications in Forensic Evidence*, PI, Funded (\$20 million total, \$456,930 sub-award)
 - USDA CIGOFF**, *Improving the Economic and Ecological Sustainability of US Crop Production through On-Farm Precision Experimentation*, PI, Funded (\$4,000,000 total, \$400,000 UNL subcontract split between 3 UNL PIs)
 - USDA NIFA AFRI**, *Corn Residue Adaptive Grazing Strategies*, Collaborator, Funded, \$300,000
 - USDA NIFA AFRI**, *Practical Framework to Facilitate Adoption of In-Season N Management Technology in Commercial Fields*, Collaborator, Not funded, \$300,000
 - NSF**, *AI Institute: AgroAI: The Institute for Advancing Agriculture and Food in a Changing World Using AI*, Collaborator, Not Funded, Total grant \$20 million, UNL subcontract request \$3,555,327
 - NSF**, *Overcoming the Rural Data Deficit to Improve Quality of Life and Community Services in Smart & Connected Small Communities*, PI, Funded (\$1,500,000 total, \$123,445 subcontract)
 - USDA AFRI-SAS**, *A Cyber-Physical System for Data-Intensive Farm Management*, PI, Not funded, \$3,000,000 total
 - NIJ R&D in Forensic Science**, *Statistical Infrastructure for the Use of Error Rate Studies in the Interpretation of Forensic Evidence*, Collaborator, Funded for FY 2019, \$197,699 total, \$57,596 ISU sub-award
 - NIJ R&D in Forensic Science**, *Passive Acquisition of Footwear Class Characteristics in Local Populations*, PI, Not funded, \$383,104
 - NIJ R&D in Forensic Science**, *Evaluating Photogrammetry for 3D Footwear Impression Recovery*, PI, Not funded, \$281,755

Invited Talks

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- How do you define a circle? Perception and Computer Vision Diagnostics**, *JSM*, Section on Statistical Graphics, Seattle, WA

2021	Pandemics, Graphics, and Perception of Log Scales , <i>R-Ladies DC</i> , Washington, DC
2020	Perception and Visual Communication in a Global Pandemic , <i>Data Science, Statistics, and Visualization Conference</i> , SAMSI, Online
2020	One of these things is not like the others: Visual Statistics and Testing in Statistical Graphics , <i>Data Science Symposium</i> , South Dakota State University, Brookings, SD
2020	Big Data, Big Experiments, and Big Problems , Plant and Animal Genome, San Diego, CA
2019	Statistical Lineups for Bayesians , <i>JSM</i> , Section on Statistical Graphics, Denver, CO
2018	Clusters Beat Trend!? Testing Feature Hierarchy in Statistical Graphics , <i>SDSS</i> , Reston, VA
2015	Animint: Interactive Web-Based Animations Using Ggplot2's Grammar of Graphics , <i>JSM</i> , Seattle, WA
2014	The curse of three dimensions: Why your brain is lying to you , <i>JSM</i> , Section on Statistical Graphics Student Paper Session, Boston, MA

Contributed Talks

2021	Welcome to Forensic Statistics , <i>Data Mishaps Night</i> , Online
2018	Framed! Reproducing 150 year old charts , <i>JSM</i> , Vancouver, BC
2017	A Bayesian Approach to Visual Inference , <i>JSM</i> , Baltimore, MD
2016	Clusters Beat Trend!? Testing Feature Hierarchy in Statistical Graphics , <i>JSM</i> , Chicago, IL
2015	Visual Aptitude and Statistical Graphics , <i>InfoVis</i> , Chicago, IL
2015	Animint: Interactive, Web-Ready Graphics with R , <i>Great Plains R User Group</i> , Sioux Center, IA
2014	Do You See What I See? Using Shiny for User Testing , <i>JSM</i> , Boston, MA
2013	Signs of the Sine Illusion – why we need to care , <i>JSM</i> , Montreal, ON

Seminar Talks

2021	Pandemics, Graphics, and Perception of Log Scales , <i>NUMBATS Seminar</i> , Monash University, Melbourne, Australia
2021	Exploring Rural Quality of Life Using Data Science and Public Data , <i>QQPM Seminar</i> , University of Nebraska, Lincoln
2021	Inconclusive Conclusions: Biases and Consequences , <i>Law and Psychology Brown Bag Seminar</i> , University of Nebraska, Lincoln
2021	Visual Statistics: Communication and Graphical Testing , <i>Animal Science Seminar</i> , University of Nebraska, Lincoln
2021	How to Make Good Charts , <i>Biological and Systems Engineering GSA</i> , University of Nebraska, Lincoln
2020	Statistical Evaluation of Firearms and Toolmark Evidence , <i>Statistics Department Seminar</i> , University of Nebraska, Lincoln

Software

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

2020	vinference , <i>Analysis of visual inference experiments</i>
2019	ShoeScrubR , <i>Cleaning shoe print data for future statistical analysis</i>
2019	groovefinder , <i>Identification of grooves in scans of bullet land engraved areas</i>
2018	ShoeScrapeR , <i>Acquisition of Shoe Images and Metadata from Online Retailers</i>
2018	bulletxtctr , <i>Automated matching of 3d bullet scans</i>
2018	x3ptools , <i>Reading, manipulating, and visualizing x3p files</i>
2018	bulletsamplr , <i>Resampling of bullet signatures</i>
2018	ImageAlignR , <i>Image registration algorithms for forensics</i>
2013 2015	animint , <i>animated, interactive web graphics for R using d3.js</i>

Teaching

2021	Stat 218 - Introduction to Statistics , <i>University of Nebraska, Lincoln</i> , Online, asynchronous
2020	Stat 850 - Computing Tools for Statisticians , <i>University of Nebraska, Lincoln</i> , Hybrid, flipped classroom, synchronous, Course materials: https://srvanderplas.github.io/unl-stat850/ Mean evaluation: 4.76, Median: 5.0
2020	Stat 218 - Introduction to Statistics , <i>University of Nebraska, Lincoln</i> , In person synchronous Mean evaluation: 4.2, Median: 4.0
2019	Stat 585 - Data Technologies for Statistical Analysis , <i>Iowa State University</i> , In person synchronous Co-taught, assisted with curriculum development. Mean evaluation: 4.92, Median: 5.0
2017 2018	Business Intelligence Embedded Agent Program , <i>Nebraska Public Power District</i> , Hybrid Design and implement a program to mentor employees, providing instruction in data science and opportunities to apply new skills within the company. Lead one-on-one and group mentoring sessions to create a sense of community and reinforce skills learned through online courses. 16 students.
2013 2014	R Workshops , <i>Iowa State</i> , In person synchronous Introduction to R, ggplot2, data management and cleaning, package development, literate programming, and Shiny.

Mentoring and Advising

Graduate Students

2021 2022	Jayden Stack , <i>Statistics</i> , MS, Automatic Recognition of Shoe Class Characteristics
2021 2022	Rachel Rogers , <i>Statistics</i> , Ph.D., Explainable Machine Learning for Forensics in Courtrooms
2021 2022	Alison Kleffner , <i>Statistics</i> , Ph.D., Spatial Statistics and Visualization in Ecology and Agriculture Co-advised with Yawen Guan

2020 2022	Emily Robinson , <i>Statistics</i> , Ph.D, Perception and Visual Inference Co-advised with Reka Howard
2020 2022 2020	Denise Bradford , <i>Statistics</i> , Ph.D, Data Science and Interactive Graphics
2019 2022	Ved Piyush , <i>Statistics</i> , MS, Machine Learning and Computer Vision
2019 2022	Joseph Zemmels , <i>Statistics</i> , MS, Ph.D, Analysis and Matching of Cartridge Cases Completed MS (Spring 2020). Co-advised with Heike Hofmann.
2019 2020	Eryn Blagg , <i>Statistics</i> , MS, Ph.D, Analysis of Wear Development in Three-Dimensional Shoe Scans. Completed MS (Spring 2020). Co-advised with Heike Hofmann
2018 2019	Miranda Tilton , <i>Statistics</i> , MS, Footwear Class Characteristics and Computer Vision. Completed MS (Spring 2019).

Undergraduate Students

2021	Xinyu Liu , <i>Actuarial Science and Computer Science</i> , UNL FYRE Program, Machine learning for shoe sole images
2019	Jason Seo , <i>Computer Science and Statistics</i> , Undergraduate Research, R package for visualization of neural networks using the python library keras-vis.
2018 2019	Talen Fisher , <i>Computer Engineering</i> , Undergraduate Research, Tools for working with x3p files, database design for storing bullet scans and intermediate analysis products.

Summer Research Programs

2019	Molly McDermott and Andrew Maloney , <i>Research Experience for Undergraduates</i> , Summer 2019, Bullet Scan Quality and Machine Learning
2019	Syema Ailia, Emmanuelle Hernandez Morales, Tiger Ji , <i>Research Experience for Undergraduates</i> , Summer 2019, Rapid Quality Control Tools for Confocal Microscopy Scans
2018	Ben Wonderlin and Jenny Kim , <i>Young Engineers and Scientists</i> , Summer 2018, Footwear Class Characteristics and Computer Vision

Outreach

Forensic Practitioners

2021	Written Testimony , <i>Cook County DA</i> , Assessment of the Reliability of Studies of Firearms Examination in Forensics
2021	Blog Post , <i>CSAFE</i> , Q&A - Treatment of Inconclusive Results in Error Rates of Firearm Studies (Link)
2021	Webinar , <i>CSAFE</i> , Treatment of Inconclusive Results in Error Rates of Firearm Studies
2020	CSAFE Firearms Workshop , Invited Talk: Open Source Software in Forensics

Service

Service to the Discipline

2021 2024	Associate Editor , <i>Journal of Computational and Graphical Statistics</i>
2020 2023	Associate Editor , <i>R Journal</i>

2020 2022	Graphics Section Program Chair (2021) , ASA, Official duties include planning JSM sessions in 2020 and running the Data Expo in 2022
2020	Program Committee (Graphics) , <i>Symposium on Data Science and Statistics 2020</i> , Visualization Track co-chair
2019 2021	Gertrude Cox Scholarship Committee Member , ASA Assisted with selection of the Gertrude Cox Scholarship recipients and honorable mentions
2019	Uncoast Unconference Organizing Committee , Des Moines, IA Organized the first R Uncoast Unconference to bring R developers in flyover country together for a 3-day event. Over 50% of the participants at the conference were women or minorities, and participants included students, academics, and industry R programmers with a variety of experience levels in R programming.
2017 2019	Graphics Section Representative to the Council of Sections , ASA
Department and Institutional Service	
2021	R Workshop Coordinator Develop and coordinate a week of R workshops taught in January, May, and August each year
2021	Faculty Advisory Council , <i>Vice-Chair</i>
2021 2022	MS Comp Exam Committee Committee to evaluate the current MS Stat Day presentation component and consider other options for the MS program
2021	Digital Ag Minor Committee Committee to develop a digital ag minor.
2021	Data Science Joint Committee Committee of Math, Computer Science, and Statistics departments to develop a comprehensive undergraduate data science program.
2020 2021	Seminar Organizer Arrange speakers for the department seminar.
2020	SCIL 101 Poster Judge , <i>Fall Semester</i>
2019 2020	Undergraduate Program Committee Design an undergraduate statistics major and submit the proposal to the university.
Training & Professional Development	
2021 2022	Peer Review of Teaching Program Create a course portfolio for Stat 850 in order to assess course design and analyze student engagement and learning
2020	New Faculty Development Program
2020	Summer Institute for Online Teaching Online course structure and backwards design principles