

Susan Vanderplas

Curriculum Vitae

349a Hardin Hall North Wing
3310 Holdrege Street
Lincoln, NE 68483-0961
402-472-7290
✉ susan.vanderplas@unl.edu
🌐 [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 **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



- 14. 2021 Hofmann, Heike, **Susan Vanderplas**, and Alicia Carriquiry (2021). "Treatment of Inconclusives in the AFTE Range of Conclusions". In: *Law, Probability, and Risk*. Submitted Oct 2020, Accepted with revision Nov 2020.
Contribution: Writing (50%).
- 13. 2020 **Vanderplas, Susan**, Christian Röttger, Di Cook, and Heike Hofmann (Nov. 2020). "Statistical Significance Calculations for Scenarios in Visual Inference". In: *Stat*. Accepted Oct 2020.
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.  2019
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.  2013
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

2021 2022	NIJ R&D in Forensic Science , <i>Automatic Acquisition and Identification of Footwear Class Characteristics</i> , PI, Funded, \$380,650 total.
2020 2025	NIST , <i>Center for Statistics and Applications in Forensic Evidence</i> , PI, Funded (\$20 million total, \$456,930 sub-award).
2020 2023	USDA CIGOFF , <i>Improving the Economic and Ecological Sustainability of US Crop Production through On-Farm Precision Experimentation</i> , PI, Funded (\$4,000,000 total, \$400,000 UNL subcontract split between 3 UNL PIs).
2021 2022	USDA NIFA AFRI , <i>Corn Residue Adaptive Grazing Strategies</i> , Collaborator, Funded, \$300,000.
2020	USDA NIFA AFRI , <i>Practical Framework to Facilitate Adoption of In-Season N Management Technology in Commercial Fields</i> , Collaborator, Not funded, \$300,000.
2020	NSF , <i>AI Institute: AgroAI: The Institute for Advancing Agriculture and Food in a Changing World Using AI</i> , Collaborator, Not Funded, Total grant \$20 million, UNL subcontract request \$3,555,327.
2020 2023	NSF , <i>Overcoming the Rural Data Deficit to Improve Quality of Life and Community Services in Smart & Connected Small Communities</i> , PI, Funded (\$1,500,000 total, \$123,445 subcontract).
2019	USDA AFRI-SAS , <i>A Cyber-Physical System for Data-Intensive Farm Management</i> , PI, Not funded, \$3,000,000 total.
2019	NIJ R&D in Forensic Science , <i>Statistical Infrastructure for the Use of Error Rate Studies in the Interpretation of Forensic Evidence</i> , Collaborator, Funded for FY 2019, \$197,699 total, \$57,596 ISU sub-award.
2018	NIJ R&D in Forensic Science , <i>Passive Acquisition of Footwear Class Characteristics in Local Populations</i> , PI, Not funded, \$383,104.
2018	NIJ R&D in Forensic Science , <i>Evaluating Photogrammetry for 3D Footwear Impression Recovery</i> , PI, Not funded, \$281,755.

Invited Talks

2021	How do you define a circle? <i>Perception and Computer Vision Diagnostics</i> , JSM, Section on Statistical Graphics, Seattle, WA.
2020	Do You See What I See? Leveraging Human Perception in Computer Vision Tasks , JSM, Section on Statistical Graphics, Online, Session Cancelled due to COVID-related issues..
2020	Perception and Visual Communication in a Global Pandemic , <i>Data Science, Statistics, and Visualization</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

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.

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	bulletssamplr , <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

2020

Stat 850 - Computing Tools for Statisticians, *University of Nebraska, Lincoln*, Course materials: <https://srvanderplas.github.io/unl-stat850/>.

2020

Stat 218 - Introduction to Statistics, *University of Nebraska, Lincoln*.

Mean evaluation: 4.2, Median: 4.0

2019

Stat 585 - Data Technologies for Statistical Analysis, *Iowa State University*.

Co-taught, assisted with curriculum development. Mean evaluation: 4.92, Median: 5.0

2017
2018

Business Intelligence Embedded Agent Program, *Nebraska Public Power District*.

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, *Iowa State*.

Introduction to R, ggplot2, data management and cleaning, package development, literate programming, and Shiny.

Mentoring and Advising

Graduate Students

2021

Jayden Stack, *Statistics*, MS, Automatic Recognition of Shoe Class Characteristics.

2020
2021

Emily Robinson, *Statistics*, Ph.D, Perception and Visual Inference.

Co-advised with Reka Howard

2020
2021

Denise Bradford, *Statistics*, Ph.D, Data Science and Interactive Graphics.

2020

Ved Piyush, *Statistics*, MS, Machine Learning and Computer Vision.

2019
2021

Joseph Zemmels, *Statistics*, MS, Ph.D, Analysis and Matching of Cartridge Cases.

Completed MS (Spring 2020). Co-advised with Heike Hofmann.

2019
2020

Eryn Blagg, *Statistics*, 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, *Statistics*, MS, Footwear Class Characteristics and Computer Vision. .
Completed MS (Spring 2019).

Undergraduate Students

2021

Xinyu Liu, *Actuarial Science and Computer Science*, UNL FYRE Program, Machine learning for shoe sole images.

2019

Jason Seo, *Computer Science and Statistics*, Undergraduate Research, R package for visualization of neural networks using the python library keras-vis..

2018
2019

Talen Fisher, *Computer Engineering*, 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, *Research Experience for Undergraduates*, Summer 2019, Bullet Scan Quality and Machine Learning.

2019

Syema Ailia, Emmanuelle Hernandez Morales, Tiger Ji, *Research Experience for Undergraduates*, Summer 2019, Rapid Quality Control Tools for Confocal Microscopy Scans.

2018

Ben Wonderlin and Jenny Kim, *Young Engineers and Scientists*, Summer 2018, Footwear Class Characteristics and Computer Vision.

Outreach

Forensic Practitioners

2020

CSAFE Firearms Workshop, Invited Talk: Open Source Software in Forensics.

2021

Webinar, *CSAFE*, Treatment of Inconclusive Results in Error Rates of Firearm Studies.

2021

Blog Post, *CSAFE*, Q&A - Treatment of Inconclusive Results in Error Rates of Firearm Studies ([Link](#)).

Service

Service to the Discipline

2021

Associate Editor, *Journal of Computational and Graphical Statistics*.

2020

Associate Editor, *R Journal*.

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), *Symposium on Data Science and Statistics 2020*, 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

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.

2019

2020

Undergraduate Program Committee.

Design an undergraduate statistics major and submit the proposal to the university.

Training

2020

Summer Institute for Online Teaching.

Learn how to organize an online course and leverage backward design principles