

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
- 2018–2019 **Research Assistant Professor**, *Center for Statistics and Applications in Forensic Evidence*, Iowa State University
- 2015–2019 **Statistical Analyst/Consultant**, *Nebraska Public Power District*
- 2015 **Postdoc**, *Iowa State University Office of the Vice President for Research*

Publications

Student advisees indicated with *

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

Peer Reviewed Publications

- 15. 2022 Zemmels, Joseph*, **Vanderplas, Susan**, and Hofmann, Heike (2022). "A Study in Reproducibility: The Congruent Matching Cells Algorithm and cmcR package". In: *R Journal*. Accepted October 2022.
Contribution: Programming and analysis (10%), Writing (20%), Advising (40%).
- 14. 2022 Robinson, Emily A.*, Howard, Reka, and **Vanderplas, Susan** (2022). "Eye Fitting Straight Lines in the Modern Era". In: *Journal of Computational and Graphical Statistics*. DOI: [10.1080/10618600.2022.2140668](https://doi.org/10.1080/10618600.2022.2140668).
- 13. 2021 Hofmann, Heike, **Vanderplas, Susan**, and Carriquiry, Alicia (June 2021). "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](https://doi.org/10.1093/lpr/mgab002).
Contribution: Writing (50%).
- 12. 2021 **Vanderplas, Susan**, Röttger, Christian, Cook, Dianne, and Hofmann, Heike (2021). "Statistical significance calculations for scenarios in visual inference". In: *Stat* 10.1, e337. DOI: [10.1002/sta4.337](https://doi.org/10.1002/sta4.337).
Contribution: Programming and analysis (30%), Writing (65%).
- 11. 2020 **Vanderplas, Susan**, Carriquiry, Alicia, Hofmann, Heike, Hamby, James, and Tai, Xiao Hui (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%).

10. 2020

Vanderplas, Susan, Nally, Melissa, Klep, Tylor, Cadevall, Cristina, and Hofmann, Heike (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%).
9. 2020

Vanderplas, Susan, Cook, Dianne, and Hofmann, Heike (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%).
8. 2019

Rutter, Lindsay, **Vanderplas, Susan**, Cook, Dianne, and Graham, Michelle (2019). "ggenealogy: An R Package for Visualizing Genealogical Data". In: *Journal of Statistical Software* 89.13, pp. 1–31. DOI: [10.18637/jss.v089.i13](https://doi.org/10.18637/jss.v089.i13).
7. 2019

Vanderplas, Susan, Goluch, Ryan, and Hofmann, Heike (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%).
6. 2019

Sievert, Carson, **Vanderplas, Susan**, Cai, Jun, Ferris, Kevin, Khan, Faizan Uddin Fahad, and Hocking, Toby Dylan (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).
5. 2017

Vanderplas, Susan and Hofmann, Heike (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%).
4. 2016

— (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, **Vanderplas, Susan**, Oliver, Casey A, Couture, Oliver, Tuggle, Christopher K, Greenlee, M Heather West, and Honavar, Vasant (2010). "Detection of gene orthology from gene co-expression and protein interaction networks". In: *BMC bioinformatics* 11.Suppl 3, S7. DOI: [10.1186/1471-2105-11-S3-S7](https://doi.org/10.1186/1471-2105-11-S3-S7).
1. 2009



Hull, Rachel, Bortfeld, Heather, and **Koons, Susan** (2009). "Near-infrared spectroscopy and cortical responses to speech production". In: *The open neuroimaging journal* 3, p. 26. DOI: [10.2174/1874440000903010026](https://doi.org/10.2174/1874440000903010026).

Other Publications

4. 2021

Submitted as an invited response to Hullman & Gelman's "Designing for Interactive Exploratory Data Analysis Requires Theories of Graphical Inference".
VanderPlas, Susan (July 2021). "Designing Graphics Requires Useful Experimental Testing Frameworks and Graphics Derived From Empirical Results". In: *Harvard Data Science Review* 3.3. DOI: [10.1162/99608f92.7d099fd0](https://doi.org/10.1162/99608f92.7d099fd0).
3. 2019

Carriquiry, Alicia, Hofmann, Heike, Tai, Xiao Hui, and **Vanderplas, Susan** (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%).

2.  *Submitted as an invited response to Donoho's "50 years of Data Science".*
Hofmann, Heike and **Vanderplas, Susan** (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%).
 1.  Budrus, Sarah, Vanderplas, Susan, and Cook, Dianne (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 **Visual narratives of the COVID-19 pandemic** A discussion of how graphics were used during the first two years of COVID-19. In press at JDSSV.
- Exploring Rural Shrink Smart Through Guided Discovery Dashboards** with Denise Bradford. Revision submitted to Journal of Data Science, Sept 2022.
- 'You Draw It': Implementation of visually fitted trends with r2d3** with Emily Robinson and Reka Howard. Revision submitted to Journal of Data Science, Sept 2022.
- Perception of Log Scales** Assessment of perception and use of log scales to display exponential growth. Several manuscripts in preparation.
- Generalized Parallel Coordinate Plots: ggpcp** with Heike Hofmann and Antony Unwin. An R package for creation of generalized parallel coordinate plots. Paper in preparation for submission to JCGS.
- Bullet Signature Resampling** Method for resampling bullet signatures used to calculate match and non-match score distributions.

Grants

Under Review

2022

NIJ R&D in Forensic Science, *Physical Simulation of Lower Body Biomechanics for Artificial Shoe Wear and Forensics Analysis*, Co-PI, Under Review, \$73,693 UNL budget, \$299,859 total

Funded

2021

NIJ R&D in Forensic Science, *Automatic Acquisition and Identification of Footwear Class Characteristics*, PI, Funded, \$380,650 total

2020
2025

NIST, *Center for Statistics and Applications in Forensic Evidence*, PI, Funded (\$20 million total, \$456,930 sub-award)

2020
2023

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 sub-contract split between 3 UNL PIs)

2021
2022

USDA NIFA AFRI, *Corn Residue Adaptive Grazing Strategies*, Collaborator, Funded, \$300,000

2020
2023

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)

2019

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

2018

NIJ R&D in Forensic Science, *Passive Acquisition of Footwear Class Characteristics in Local Populations*, PI, Not funded, \$383,104

Not funded

2020

USDA NIFA AFRI, *Practical Framework to Facilitate Adoption of In-Season N Management Technology in Commercial Fields*, Collaborator, \$300,000

2020

NSF, AI Institute: AgroAI: The Institute for Advancing Agriculture and Food in a Changing World Using AI, Collaborator, Total grant \$20 million, UNL subcontract request \$3,555,327

2019

USDA AFRI-SAS, A Cyber-Physical System for Data-Intensive Farm Management, PI, \$3,000,000 total

2018

NIJ R&D in Forensic Science, Evaluating Photogrammetry for 3D Footwear Impression Recovery, PI, \$281,755

Talks

Invited

2021

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, *R-Ladies DC*, Washington, DC

2020

Perception and Visual Communication in a Global Pandemic, *Data Science, Statistics, and Visualization Conference*, SAMSI, Online

2020

One of these things is not like the others: Visual Statistics and Testing in Statistical Graphics, *Data Science Symposium*, 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, *JSM*, Section on Statistical Graphics, Denver, CO

2018

Clusters Beat Trend!? Testing Feature Hierarchy in Statistical Graphics, *SDSS*, Reston, VA

2015

Animint: Interactive Web-Based Animations Using Ggplot2's Grammar of Graphics, *JSM*, Seattle, WA

2014

The curse of three dimensions: Why your brain is lying to you, *JSM*, Section on Statistical Graphics Student Paper Session, Boston, MA

Contributed

2022

An Introduction to the Automatic and Objective Firearm Evidence Identification, *International Association for Identification*, Omaha, NE

2022

Local Population Footwear Class Characteristics - An End-to-End Pipeline for Automatic Data Acquisition and Analysis, *International Association for Identification*, Omaha, NE

2021

Welcome to Forensic Statistics, *Data Mishaps Night*, Online

2018

Framed! Reproducing 150 year old charts, *JSM*, Vancouver, BC

2017

A Bayesian Approach to Visual Inference, *JSM*, Baltimore, MD

2016

Clusters Beat Trend!? Testing Feature Hierarchy in Statistical Graphics, *JSM*, Chicago, IL

2015

Visual Aptitude and Statistical Graphics, *InfoVis*, Chicago, IL

2015

Animint: Interactive, Web-Ready Graphics with R, *Great Plains R User Group*, Sioux Center, IA

2014

Do You See What I See? Using Shiny for User Testing, *JSM*, Boston, MA

2013

Signs of the Sine Illusion – why we need to care, *JSM*, Montreal, ON

Seminars

2022

How to Make Good Charts, *CBIO Seminar*, University of Nebraska, Lincoln

2021

Pandemics, Graphics, and Perception of Log Scales, *NUMBATS Seminar*, Monash University, Melbourne, Australia

2021

Exploring Rural Quality of Life Using Data Science and Public Data, *QQPM Seminar*, University of Nebraska, Lincoln

2021

Inconclusive Conclusions: Biases and Consequences, *Law and Psychology Brown Bag Seminar*, University of Nebraska, Lincoln

2021

Visual Statistics: Communication and Graphical Testing, *Animal Science Seminar*, University of Nebraska, Lincoln

2021

How to Make Good Charts, *Biological and Systems Engineering GSA*, University of Nebraska, Lincoln

2020

Statistical Evaluation of Firearms and Toolmark Evidence, *Statistics Department Seminar*, University of Nebraska, Lincoln

Software

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

2021

ggpcp, *Generalized parallel coordinate plots*

2020

vinference, *Analysis of visual inference experiments*

2019

groovefinder, *Identification of grooves in scans of bullet land engraved areas*

2019

cmcR, *Automated matching of 3d cartridge case scans using the congruent matching cells algorithm*

2018

bulletxtctr, *Automated matching of 3d bullet scans*

2018

x3ptools, *Reading, manipulating, and visualizing x3p files*

2018

bulletsamplr, *Resampling of bullet signatures*

2018

ShoeScraperR, *Acquisition of Shoe Images and Metadata from Online Retailers*

2020

ImageAlignR, *Image registration algorithms for forensics*

2020

animint, *animated, interactive web graphics for R using d3.js*

2013

2015

Teaching

2022

Stat 892 - Writing in Statistics/TA Prep, *University of Nebraska, Lincoln*, In person, synchronous

2022

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

2022

Stat 982 - Advanced Inference, *University of Nebraska, Lincoln*, In person, synchronous, reading course

Co-taught

2022

Stat 151 - Introduction to Statistical Computing, *University of Nebraska, Lincoln*, Hybrid, flipped classroom, synchronous, Statistical programming in R and python. Course materials: <https://srvanderplas.github.io/Stat151/>

2021

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

Mean evaluation: 4.76, Median: 5.0

2021	Stat 218 - Introduction to Statistics , <i>University of Nebraska, Lincoln</i> , Online, asynchronous Mean evaluation: 4.0, Median: 4.0
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
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.
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

2022	Tyler Wiederich , <i>Statistics</i> , MS, Perception of Three-Dimensional Graphics
2022	Muxin Ha , <i>Statistics</i> , MS, Automatic Recognition of Shoe Class Characteristics
2021	Rachel Rogers , <i>Statistics</i> , Ph.D., Explainable Machine Learning for Forensics in Courtrooms
2021	Alison Kleffner , <i>Statistics</i> , Ph.D., Spatial Statistics and Visualization in Ecology and Agriculture Co-advised with Yawen Guan
2020	Denise Bradford , <i>Statistics</i> , Ph.D, Data Science and Interactive Graphics
2021	Jayden Stack , <i>Statistics</i> , MS, Automatic Recognition of Shoe Class Characteristics
2020	Emily Robinson , <i>Statistics</i> , Ph.D, Perception and Visual Inference Co-advised with Reka Howard
2020	Ved Piyush , <i>Statistics</i> , MS, Machine Learning and Computer Vision
2019	Joseph Zemmels , <i>Statistics</i> , MS, Ph.D, Analysis and Matching of Cartridge Cases Completed MS (Spring 2020). Co-advised with Heike Hofmann.
2019	Eryn Blagg , <i>Statistics</i> , MS, Ph.D, Analysis of Wear Development in Three-Dimensional Shoe Scans. Co-advised with Heike Hofmann
2018	Miranda Tilton , <i>Statistics</i> , MS, Footwear Class Characteristics and Computer Vision.

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, *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

Legal Briefs and Testimony

2022

Amicus Curiae Brief, *Supreme Court of New Jersey*, A-56-18 State v. Michael Olenowski (082253)

2022

Amicus Curiae Brief, *Supreme Court of Maryland*, In Support of Appellant Kobina Ebo Abruquah

2022

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

2021

Written Testimony, *Cook County Circuit Court*, Assessment of the Reliability of Studies of Firearms Examination in Forensics

Forensic Practitioners

2021

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

2021

Webinar, *CSAFE*, 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

2023

Advisory Committee on Forensic Science, ASA

2025

2023

Graphics Section Chair, ASA

2024

2022

Graphics Section Chair-Elect, ASA

2023

2021

Associate Editor, *Journal of Computational and Graphical Statistics*

2024

2020

Associate Editor, *R Journal*

2023

2020

Graphics Section Program Chair (2021), ASA, Official duties include planning JSM sessions in 2020 and running the Data Expo in 2022

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

R Workshop Coordinator

Develop and coordinate a week of R workshops taught in January, May, and August each year

2021

Faculty Senate, Statistics Department Representative

2022

2021

Faculty Advisory Council, Vice-Chair

2022

2021

MS Comp Exam Committee

2022

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

Seminar Organizer

2021

Arrange speakers for the department seminar.

2020

SCIL 101 Poster Judge, Fall Semester

2019

Undergraduate Program Committee

2020

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

Training & Professional Development

2022

Nebraska Governance and Technology Center, Faculty Fellow

2023

2021

Peer Review of Teaching Program

2022

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