

# 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 **Statistical Analyst**, *Nebraska Public Power District*.
- 2015 **Postdoc**, *Iowa State University Office of the Vice President for Research*.


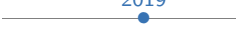

### Scholarship




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


#### Journal Publications

- 16. 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>.
- 15. 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%).
- 14. 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%).

13. 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%).
12. 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%).
11. 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%).
10. 2019  

Rutter, Lindsay, **Susan VanderPlas**, Dianne Cook, and Michelle Graham (2019). "ggenealogy: 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).
9. 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%).
8. 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).
7. 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%).
6. 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%).
5. 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%).
4. 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%).
3. 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).
2. 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**

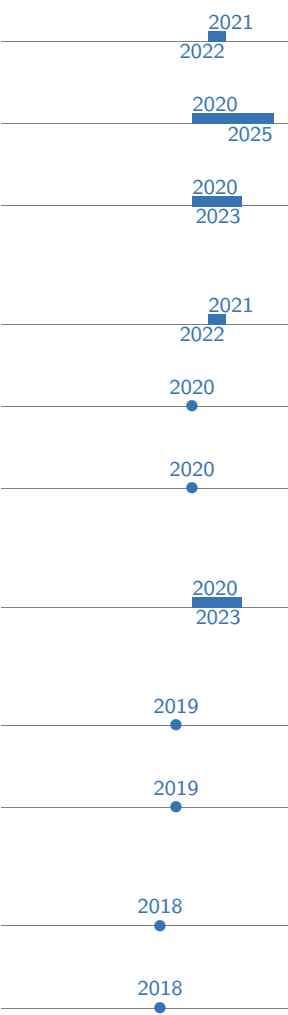
**Generalized Parallel Coordinate Plots: ggpcp** An R package for creation of generalized parallel coordinate plots

**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

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

#### Contributed Talks

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

#### Seminar Talks

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

2020	<b>Statistical Evaluation of Firearms and Toolmark Evidence</b> , <i>Statistics Department Seminar</i> , University of Nebraska, Lincoln.
	<b>Software</b>
	Dates show initial involvement; only packages which are no longer maintained have end dates.
2021	<b>ggpcp</b> , <i>Generalized parallel coordinate plots</i> .
2020	<b>vinference</b> , <i>Analysis of visual inference experiments</i> .
2019	<b>ShoeScrubR</b> , <i>Cleaning shoe print data for future statistical analysis</i> .
2020	<b>groovefinder</b> , <i>Identification of grooves in scans of bullet land engraved areas</i> .
2019	
2018	<b>ShoeScrapeR</b> , <i>Acquisition of Shoe Images and Metadata from Online Retailers</i> .
2018	<b>bulletxtrctr</b> , <i>Automated matching of 3d bullet scans</i> .
2018	<b>x3ptools</b> , <i>Reading, manipulating, and visualizing x3p files</i> .
2018	<b>bulletssamplr</b> , <i>Resampling of bullet signatures</i> .
2018	<b>ImageAlignR</b> , <i>Image registration algorithms for forensics</i> .
2013	<b>animint</b> , <i>animated, interactive web graphics for R using d3.js</i> .
2015	

## Teaching

2021	<b>Stat 850 - Computing Tools for Statisticians</b> , <i>University of Nebraska, Lincoln</i> , Hybrid, flipped classroom, synchronous, Course materials: <a href="https://srvanderplas.github.io/unl-stat850/">https://srvanderplas.github.io/unl-stat850/</a> . Mean evaluation: 4.76, Median: 5.0
2021	<b>Stat 218 - Introduction to Statistics</b> , <i>University of Nebraska, Lincoln</i> , Online, asynchronous. Mean evaluation: 4.0, Median: 4.0
2020	<b>Stat 850 - Computing Tools for Statisticians</b> , <i>University of Nebraska, Lincoln</i> , Hybrid, flipped classroom, synchronous, Course materials: <a href="https://srvanderplas.github.io/unl-stat850/">https://srvanderplas.github.io/unl-stat850/</a> . Mean evaluation: 4.76, Median: 5.0
2020	<b>Stat 218 - Introduction to Statistics</b> , <i>University of Nebraska, Lincoln</i> , In person synchronous. Mean evaluation: 4.2, Median: 4.0
2019	<b>Stat 585 - Data Technologies for Statistical Analysis</b> , <i>Iowa State University</i> , In person synchronous. Co-taught, assisted with curriculum development. Mean evaluation: 4.92, Median: 5.0
2017	<b>Business Intelligence Embedded Agent Program</b> , <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.
2018	
2013	<b>R Workshops</b> , <i>Iowa State</i> , In person synchronous. Introduction to R, ggplot2, data management and cleaning, package development, literate programming, and Shiny.
2014	

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## Mentoring and Advising

### Graduate Students

2021

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

2021

**Rachel Rogers**, *Statistics*, Ph.D., Explainable Machine Learning for Forensics in Courtrooms.

2021

**Alison Kleffner**, *Statistics*, Ph.D., Spatial Statistics and Visualization in Ecology and Agriculture.

Co-advised with Yawen Guan

2020

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

Co-advised with Reka Howard

2020

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

2020

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

2019

**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.

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## Outreach

### Forensic Practitioners

2021

**Written Testimony**, *Cook County DA*, Assessment of the Reliability of Studies of Firearms Examination in Forensics.

2021

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

2021

2020

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

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

## Service

### Service to the Discipline

2021

2024

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

2020

2023

**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

**R Workshop Coordinator**.

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

2021

2022

**Faculty Advisory Council**, *Vice-Chair*.

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**, *Fall Semester*.

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**.



## **Summer Institute for Online Teaching.**

Online course structure and backwards design principles