

# 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.
- 2018-2019 • **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

- 14. 2021 • Hofmann, Heike, **Susan Vanderplas**, and Alicia Carriquiry (). "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 (). "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 (). "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. 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 (). "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 (). "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 (). "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).
8. 2019  
**VanderPlas, Susan**, Ryan Goluch, and Heike Hofmann (). "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 (). "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 (). "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** (). "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 (). "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  
— (). "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 (). "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** (). "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** (). "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 (). "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. Submitted to Journal of Statistics and Data Mining, April 2020.
- Longitudinal Shoe Database** Design a database for sharing longitudinal shoe wear data, including powder prints, 2D scans, 3D scans, pictures, and crime-scene style casts and prints. Submitted to Forensic Science International, Oct 2020.
- Bullet Signature Resampling** Method for resampling bullet signatures used to calculate match and non-match score distributions.

## Grants

2021 2022	<b>NIJ R&amp;D in Forensic Science</b> , <i>Automatic Acquisition and Identification of Footwear Class Characteristics</i> , PI, Funded, \$380,650 total.
2020 2025	<b>NIST</b> , <i>Center for Statistics and Applications in Forensic Evidence</i> , PI, Funded (\$20 million total, \$456,930 sub-award).
2020 2023	<b>USDA CIGOFF</b> , <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	<b>USDA NIFA AFRI</b> , <i>Corn Residue Adaptive Grazing Strategies</i> , Collaborator, Funded, \$300,000.
2020	<b>USDA NIFA AFRI</b> , <i>Practical Framework to Facilitate Adoption of In-Season N Management Technology in Commercial Fields</i> , Collaborator, Not funded, \$300,000.
2020	<b>NSF</b> , <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	<b>NSF</b> , <i>Overcoming the Rural Data Deficit to Improve Quality of Life and Community Services in Smart &amp; Connected Small Communities</i> , PI, Funded (\$1,500,000 total, \$123,445 subcontract).
2019	<b>USDA AFRI-SAS</b> , <i>A Cyber-Physical System for Data-Intensive Farm Management</i> , PI, Not funded, \$3,000,000 total.
2019	<b>NIJ R&amp;D in Forensic Science</b> , <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	<b>NIJ R&amp;D in Forensic Science</b> , <i>Passive Acquisition of Footwear Class Characteristics in Local Populations</i> , PI, Not funded, \$383,104.
2018	<b>NIJ R&amp;D in Forensic Science</b> , <i>Evaluating Photogrammetry for 3D Footwear Impression Recovery</i> , PI, Not funded, \$281,755.

## Invited Talks

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

2020	<b>Perception and Visual Communication in a Global Pandemic</b> , <i>Data Science, Statistics, and Visualization</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

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.

### Software

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

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> .
2019	<b>groovefinder</b> , <i>Identification of grooves in scans of bullet land engraved areas</i> .
2018	<b>ShoeScrapeR</b> , <i>Acquisition of Shoe Images and Metadata from Online Retailers</i> .
2018	<b>bulletxtctr</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 2015	<b>animint</b> , <i>animated, interactive web graphics for R using d3.js</i> .

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## 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.

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## Mentoring and Advising

### Graduate Students

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  
2020  
2019

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

**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

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.

## Service

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.