

# Susan Vanderplas

## Curriculum Vitae

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### Education

2011–15

**Doctor of Philosophy in Statistics, Iowa State University.**

Dissertation: The Perception of Statistical Graphics

2009–2011

**Master of Science in Statistics, Iowa State University.**

2005–2009

**Bachelor of Science, Texas A&M University.**

Major: Psychology and Applied Mathematical Sciences (Statistics), Minor: Neuroscience

### Professional Experience

2018

**Research Assistant Professor, Center for Statistics and Applications in Forensic Evidence, Iowa State University.**

2015  
2018

**Statistical Analyst, Nebraska Public Power District.**

Conducted analyses to improve NPPD's data-driven decision making, including analysis of safety, profitability, and reliability data. Designed a program to train employees in statistical programming, data analysis, data visualization, and basic statistical modeling.

2015

**Postdoc, Iowa State University Office of the Vice President for Research, Ames, IA.** Evaluated the relationship between faculty start-up packages and future productivity.

2014

**Consultant.**

Developed web applications, interactive data displays, and statistical analyses for clients including the Iowa Soybean Association, ISU Agronomy Labs, and the USDA.

[Nitrogen Deficiency in Corn, Crop Yield Forecast](#)

### Research Interests

#### COMPUTING & GRAPHICS

- Visual inference
- Perception of charts
- Interactive graphics
- Image analysis
- Computer vision
- Machine learning

#### FORENSICS

- Statistical graphics in legal settings
- Algorithmic mimicry of human perception
- Automatic footwear identification
- Firearms/toolmark analysis

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## Teaching

2017

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

Designed a program to mentor employees, providing instruction in data science and opportunities to apply new skills within the company. One-on-one and group mentoring sessions were used to create a sense of community and to reinforce skills learned through online courses.

2017

**R Workshop**, *Nebraska Public Power District*.

3-day internal course on using R for data analysis.

2013-2014

**R Workshops**, *Iowa State*.

Spring 2013

**Statistical Methods for Research**, *Iowa State*, Teaching Assistant.

2012-2013

**Introduction to Business Statistics II**, *Iowa State*, Teaching Assistant.

2011

**Statistical Methods for Research**, *Iowa State*, Teaching Assistant.

2011

**Empirical Methods for Comp. Sci.**, *Iowa State*, Teaching Assistant.

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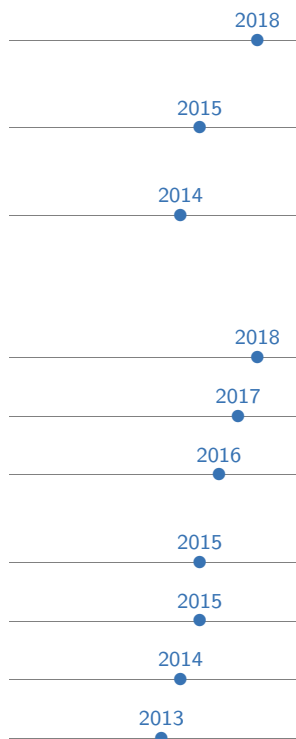
## Scholarship

### Publications

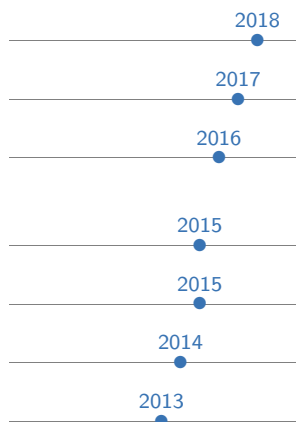
- 2018 Susan VanderPlas, Ryan Goluch, and Heike Hofmann. Framed! reproducing 150 year old plots. *Journal of Computational and Graphical Statistics*, 2018.
- Carson Sievert, J Cai, Susan VanderPlas, F Khan, K Ferris, and Toby Hocking. Extending ggplot2 for linked and dynamic web graphics. *Journal of Computational and Graphical Statistics*, 2018.
- 2017 Susan VanderPlas and Heike Hofmann. Clusters beat trend!? testing feature hierarchy in statistical graphics. *Journal of Computational and Graphical Statistics*, 26(2):231–242, 2017.
- Lindsay Rutter, Susan VanderPlas, Dianne Cook, and Michelle Graham. ggeanealogy: An R package for visualizing genealogical data. *Journal of Statistical Software*, 2017.
- Heike Hofmann and Susan VanderPlas. All of this has happened before. all of this will happen again: Data science. *Journal of Computational and Graphical Statistics*, 26(4):775–778, 2017.
- 2016 Susan VanderPlas and Heike Hofmann. Spatial reasoning and data displays. *IEEE Transactions on Visualization and Computer Graphics*, 2016.
- 2015 Susan VanderPlas and Heike Hofmann. Signs of the sine illusion - why we need to care. *Journal of Computational and Graphical Statistics*, 24(4):1170–1190, 2015.
- 2010 Fadi Towfic, 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. *BMC bioinformatics*, 11(Suppl 3):S7, 2010.

- 2009 Rachel Hull, Heather Bortfeld, and **Susan Koons**. Near-infrared spectroscopy and cortical responses to speech production. *The open neuroimaging journal*, 3:26, 2009.
- In Progress **Visual Inference for Bayesians** An examination of two-target statistical lineups as the visual analog of Bayes Factors.
- Truthiness and Statistical Charts** Evaluating whether the truthiness effect (increased belief in a statement based on the presence of an accompanying picture) holds for statistical charts and maps.
- Longitudinal Shoe Database** Features of a database for longitudinal shoe data, collected using many techniques.
- Bullet Signature Resampling** Resampling bullet signatures for use in the calculation of match statistic null distributions.
- Bullet Test Set Validation** Validation of a bullet matching algorithm on several test sets used to characterize forensic examiner proficiency.
- Continuous Integration and Unit Testing in Forensics Software** Best practices for development of forensics software, including use of continuous integration, unit testing, version control systems, and open-source licensing.
- Footwear Class Characteristic Recognition using Neural Networks** Using Convolutional Neural Networks to identify class characteristics in images of footwear outsoles. These characteristics form a feature set which can be used for automating footwear identification as well as more advanced statistical modeling.

## Invited Talks

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- 2018 **Clusters Beat Trend!? Testing Feature Hierarchy in Statistical Graphics**, *SDSS Invited Session*.
- 2015 **Animint: Interactive Web-Based Animations Using Ggplot2's Grammar of Graphics**, *JSM Invited Session*.
- 2014 **The curse of three dimensions: Why your brain is lying to you**, *JSM Student Paper Award Session*.

## Contributed Talks

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- 2018 **Framed! Reproducing 150 year old charts**, *JSM Contributed Session*.
- 2017 **A Bayesian Approach to Visual Inference**, *JSM Contributed Session*.
- 2016 **Clusters Beat Trend!? Testing Feature Hierarchy in Statistical Graphics**, *JSM Contributed Session*.
- 2015 **Visual Aptitude and Statistical Graphics**, *InfoVis*.
- 2015 **Animint: Interactive, Web-Ready Graphics with R**, *Great Plains R User Group*.
- 2014 **Do You See What I See? Using Shiny for User Testing**, *JSM Panel*.
- 2013 **Signs of the Sine Illusion – why we need to care**, *JSM Contributed Session*.

## Software

2018

**bulletssamplr**, *Resampling of bullet signatures (active development)*.

2018

**ImageAlignR**, *Image registration algorithms for forensics (active development)*.

2018

**bulletxtctr**, *automated matching of 3d bullet scans (with Heike Hofmann)*.

2018

**x3ptools**, *Reading, manipulating, and visualizing x3p files (with Heike Hofmann)*.

2013  
2015

**animint**, *animated, interactive web graphics for R using d3.js (with Toby Hocking, Carson Sievert)*.

## Mentoring and Advising

2018

**Miranda Tilton**, *Statistics*, MS Project.

Footwear Class Characteristics and Computer Vision

2018

**Talen Fisher**, *Computer Engineering*, Undergraduate Research.

Tools for working with x3p files, database design for storing bullet scans and intermediate analysis products.

2018

**Ben Wonderlin and Jenny Kim**, *Young Engineers and Scientists*, Summer 2018.

Footwear Class Characteristics and Computer Vision

## Service

2017  
2019

**Graphics Section Representative to the Council of Sections, ASA.**