

# Susan Vanderplas

## Curriculum Vitae

195C Durham Center

613 Morrill Rd

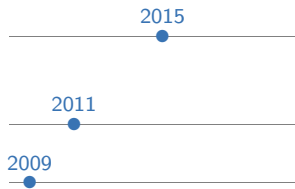
Ames, IA 50011

☎ 515-509-6613

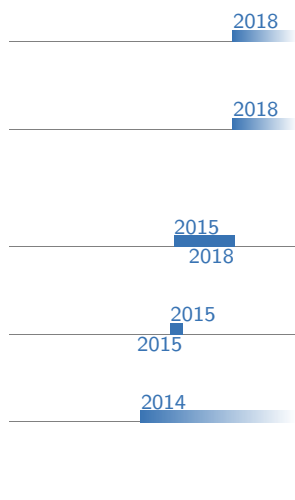
✉ [srvander@iastate.edu](mailto:srvander@iastate.edu)

🌐 [srvanderplas](https://srvanderplas.github.io)

### Education

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- A horizontal timeline with three blue dots. The first dot is at the year 2009, the second at 2011, and the third at 2015. Each dot is connected to a horizontal line segment.
- 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

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- A horizontal timeline with five blue bars of varying lengths. The bars are labeled with years: 2018, 2018, 2015-2018, 2015, and 2014. Each bar is connected to a horizontal line segment.
- 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.
  - 2015-2018** **Statistical Analyst**, *Nebraska Public Power District*.
  - 2015** **Postdoc**, *Iowa State University Office of the Vice President for Research*.
  - 2014** **Consultant**.  
Develop web applications, interactive data displays, and statistical analyses for clients including the Iowa Soybean Association, ISU Agronomy Labs, and the USDA.

### Scholarship

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

- In Progress **A Convolutional Neural Network for Outsole Recognition** Use CNNs to automate identification of class characteristics in images of footwear outsoles. Submitted to Forensic Science International, July 2019.
- Testing Statistical Charts: What makes a good graph?** A review of research relating to the testing of statistical graphics across different domains and disciplines. Submitted to Annual Reviews, June 2019.
- Firearms Examination** (Book Chapter) An overview of statistical methods for firearms examination. Submitted July 2019; Under Review.
- Bullet Test Set Validation** Validate an algorithm for bullet matching on several test sets used to test forensic examiner proficiency. To be submitted to Forensic Science International, August 2019.
- Visual Inference for Bayesians** Visual Inference analyses for Bayesians, including estimation of the selection probability of null plots.
- 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.
- Bullet Signature Resampling** Method for resampling bullet signatures used to calculate match and non-match score distributions.

## Grants

- 2019  
**NSF, USDA National Institute of Food and Agriculture, A Cyber-Physical System for Data-Intensive Farm Management**, PI, Under review (Submitted September 2019), \$3,000,000.
- 2019  
**NSF, Overcoming the Rural Data Deficit to Improve Quality of Life and Community Services in Smart & Connected Small Communities**, PI, Under review (Submitted September 2019), \$1,500,000.
- 2019  
 2021  
**USDA National Institute of Food and Agriculture, Understanding Opioid Risks in Rural and Micropolitan Communities: Economic Restructuring, Social Disorganization, and Local Responses.**, PI, Award number: 2018-68006-27640. Funded for FY 2018-2021, \$498,401.00.
- 2019  
**NIJ R&D in Forensic Science, Automatic Acquisition and Identification of Footwear Class Characteristics**, PI, Under review (Submitted April 2019) \$386,984.
- 2018  
 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.
- 2018  
**NIJ R&D in Forensic Science, Evaluating Photogrammetry for 3D Footwear Impression Recovery**, PI, Not funded, \$281,755.

## Invited Talks

- 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 Talks

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.

## Software

2019

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

2018

**ShoeScrapeR**, *Acquisition of Shoe Images and Metadata from Online Retailers.*

2018

**bulletxtctr**, *Automated matching of 3d bullet scans.*

2018

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

2018

**bulletssamplr**, *Resampling of bullet signatures.*

2018

**ImageAlignR**, *Image registration algorithms for forensics.*

2013

2015

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

## Teaching

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. Class size: 16

2017

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

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

2013  
2014

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

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

2011  
2013

## **Statistical Methods for Research, Iowa State, TA.**

2012  
2013

## **Introduction to Business Statistics II, Iowa State, TA.**

2011

## **Empirical Methods for Computer Science, Iowa State, TA.**

# Mentoring and Advising

## Graduate Students

2018

### **Miranda Tilton, Statistics, Ph.D.**

Footwear Class Characteristics and Computer Vision. Completed MS (Spring 2019).

2019

### **Charlotte Roiger, Statistics, MS.**

Detection of Topological Features of Bullet Lands using Computer Vision. Estimated MS completion in Spring 2020. Co-advised with Heike Hofmann.

2019

### **Joseph Zemmels, Statistics, MS.**

Analysis and Matching of Cartridge Cases. Estimated MS completion in Summer 2020. Co-advised with Heike Hofmann.

2019

### **Eryn Blagg, Statistics, MS.**

Analysis of Wear Development in Three-Dimensional Shoe Scans. Estimated MS completion in Fall 2020.

## Undergraduate Students

2019

### **Jason Seo, Computer Science and Statistics, Undergraduate Research.**

R package for visualization of neural networks using the python library keras-vis.

2019

### **Jenny Ha, Computer Science, Undergraduate Research.**

Database design for storing bullet scans and intermediate analysis products.

2018

### **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

### **Graphics Section Program Chair, ASA.**

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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.

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2019

**Gertrude Cox Scholarship Committee Member, ASA.**

Assisted with selection of the Gertrude Cox Scholarship recipients and honorable mentions.

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2017  
2019

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