





# Susan VanderPlas

## Curriculum vitae

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## EDUCATION

2011-2015\* **Ph.D. in Statistics**  
*Iowa State University*

2009-2011 **M.S. in Statistics**  
*Iowa State University*

2005-2009 **B.S. in Psychology and Applied Mathematical Sciences**  
*Texas A&M University*

## TECHNICAL SKILLS

**Statistical Techniques** Experience with linear, generalized, and mixed models as well as bayesian regression and hierarchical models. Familiar with data mining techniques, multivariate data analysis, time series and nonparametric techniques. Expertise in the creation of statistical graphics to communicate data and results to non-statisticians.

**Statistical Software** R (programming, graphics, package development), SAS (for linear and mixed models), JMP (for basic analysis and data mining)

**Programming and Database Software** C and C++, with integration of binary files into R programs; JavaScript, git, SQL and MySQL.

**Web Development** Familiar with RStudio's Shiny web applet framework, d3 interactive graphics, use of knitr and pandoc to integrate code and documentation in R, Apache and MySQL web server configuration and administration.

**Other** Proficient in Word, Powerpoint, and Excel, as well as LaTeX. Familiar with Linux and Windows, as well as computer hardware.

## AWARDS AND GRANTS

ASA STUDENT PAPER AWARD • Graphics section  
NSF IGERT FELLOWSHIP • 2009-2011  
TEXAS A&M • Foundation, University, Liberal Arts, Psychology, and Math Honors  
RESEARCH FELLOW • Texas A&M, 2009  
UNIVERSITY SCHOLAR • Texas A&M, 2006-2009  
ASTRONAUT SCHOLAR • 2009  
PRESIDENT'S ENDOWED SCHOLARSHIP • 2005-2009  
DIRECTOR'S EXCELLENCE AWARD • 2005-2009  
NATIONAL MERIT AWARD • Texas A&M  
NATIONAL MERIT SCHOLAR • 2005

## EXPERIENCE

### Ph.D. Research

Iowa State University SUMMER 2012-PRESENT  
Designed and analyzed experiments to understand human perception of statistical graphics. Optimized graphics to clearly communicate statistical results and counteract perceptual biases identified during experiments. [5-8]

### Research Assistant

USDA and ISU Statistics FALL 2013-PRESENT  
Analyzed large quantities of soybean genetics data to identify inheritance, important genes, and copy number variation. Created interactive applets presenting the data along with graphics designed to encourage biologists to explore the results. Assembled a database of known soybean parentage to facilitate further research and wrote code to efficiently search the database to identify the lineage of any variety in the database.

### Informal Consulting

FALL 2012-PRESENT  
Provided informal statistical advice to nuclear engineers on proper methods for bootstrap, k95/95 intervals, probability analysis, and other modeling questions. Helped to estimate capacity factor using block bootstrap, answered questions about probability theory and model assessment, and assessed violations of modeling assumptions. Assembled data sets containing years of hourly power prices to explore downpower timing and market relationships.

### R Course Instructor

ISU Statistics SPRING 2013-PRESENT  
Designed and conducted workshops to teach R skills to the members of the university and local business community. Workshop topics included an introduction to R, ggplot2, data management with plyr, reshape2, and stringr, package development, document creation with knitr, linear models, and creating web applets with Shiny.

### Programmer

ISU Statistics SPRING 2013-FALL 2014  
Created and redesigned web-based applets to teach statistical techniques interactively. Applets include Method of Least Squares, ANOVA, K Means, Regression diagnostics, and many other introductory statistics concepts. Link: [Applets](#)

### Consulting

Iowa State FALL 2013-SPRING 2013  
Provided modeling advice and statistical expertise to aerospace engineering professors conducting research on teaching methods.

R Project SUMMER 2013, 2014  
 Worked to develop the `animint` package for R to  
 translate `ggplot2` into `d3` interactive JavaScript  
 graphics. Participated in the project in 2013,  
 adding support for all `ggplot2` geoms as well as  
 most scales and axes. Returned to serve as a men-  
 tor for the project in 2014. [4]

ISU Statistics FALL 2011, 2012, SPRING 2013  
Created interesting and relevant lab materials and demonstrated statistical methodology to undergraduate and graduate students in business, biology, and engineering along with the use of statistical software (R, SAS, and JMP).

Iowa DOT and ISU Statistics      JAN-AUG 2012  
Developed a hierarchical Bayesian model to determine the effectiveness of road interventions on traffic accidents and fatalities. Discovered a previously unknown error in the available data that was used in prior analyses using exploratory techniques, and developed a method to compensate for missing data.

Iowa State University      SPRING 2010-FALL 2011  
Worked with the materials science and engineering department at ISU to develop and implement nonparametric methods for peak detection in mass spectroscopy data. Helped to fit systems of differential equations to spectroscopy data based on theoretical concepts from quantum physics to facilitate inference about the atomic structure of the material.

Iowa State University SUMMER 2009  
Worked with biologists and bioinformaticians to  
compare homologous gene expression in humans,  
pigs, and mice. [3]

University of Nebraska  
Created a mathematical model describing electrical impulse transmission and decay along neurons with varying states of myelination.

- [1] Sarah Budrus, Susan VanderPlas, and Dianne Cook. In tennis, do smashes win matches? *Significance*, 10(3):35–38, 2013.
- [2] Rachel Hull, Heather Bortfeld, and Susan Koons. Near-infrared spectroscopy and cortical responses to speech production. *The open neuroimaging journal*, 3:26, 2009.
- [3] 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.
- [4] Susan VanderPlas. Animint: Animated, interactive, web-ready graphics with R. Presentation at Great Plains R Users Group (Joint work with Toby Hocking), May 2014.
- [5] Susan VanderPlas. The curse of three dimensions: Why your brain is lying to you. Presentation at JSM (Computing & Graphics Student Paper Competition), August 2014.
- [6] Susan VanderPlas. Do You See What I See? using Shiny for user testing. Panel on Formal Usability Testing and Statistical Graphics at JSM, August 2014.
- [7] Susan VanderPlas and Heike Hofmann. Signs of the sine illusion – why we need to care. Presentation at JSM, August 2013.
- [8] Susan VanderPlas and Heike Hofmann. Signs of the sine illusion - why we need to care. *Journal of Computational and Graphical Statistics*, 2014.