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. Some python for web scraping.

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.

Awards

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.

Consulting

Nebraska Public Power 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, answed 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

ISU Aerospace Engineering Fall 2013
Provided modeling advice and statistical expertise to aerospace engineering professsors conducting research on active learning.

Google Summer of Code

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 mentor for the project in 2014. [4]

Teaching Assistant

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, social sciences, and engineering along with the use of statistical software (R, SAS, and JMP). Taught lab sections for business and graduate statistics in the social sciences.

Research Assistant

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.

M.S. Research

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.

NSF Research Experience for Undergrads

Iowa State University SUMMER 2009

Worked with biologists and bioinformaticians to compare homologous gene expression in humans, pigs, and mice. [3]

NSF Research Experience for Undergrads

University of Nebraska SUMMER 2008

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

PUBLICATIONS & PRESENTATIONS

[1] BUDRUS, S., **VANDERPLAS, S.**, AND COOK, D. In tennis, do smashes win matches? *Significance 10*, 3 (2013), 35–38.

[2] HULL, R., BORTFELD, H., AND **KOONS, S.** Near-infrared spectroscopy and cortical responses to speech production. *The open neuroimaging journal 3* (2009), 26.

[3] TOWFIC, F., **VANDERPLAS, S.**, OLIVER, C. A., COUTURE, O., TUGGLE, C. K., GREENLEE, M. H. W., AND HONAVAR, V. Detection of gene orthology from gene co-expression and protein interaction networks. *BMC bioinformatics 11*, Suppl 3 (2010), S7.

[4] **VANDERPLAS, S.** Animint: Animated, interactive, web-ready graphics with R. Presentation at Great Plains R Users Group (Joint work with Toby Hocking), May 2014.

[5] **VANDERPLAS, S.** The curse of three dimensions: Why your brain is lying to you. Presentation at JSM (Computing & Graphics Student Paper Competition), August 2014.

[6] **VANDERPLAS, S.** Do You See What I See? using Shiny for user testing. Panel on Formal Usability Testing and Statistical Graphics at JSM, August 2014.

[7] **VANDERPLAS, S.**, AND HOFMANN, H. Signs of the sine illusion – why we need to care. Presentation at JSM, August 2013.

[8] **VANDERPLAS, S.**, AND HOFMANN, H. Signs of the sine illusion - why we need to care. *Journal of Computational and Graphical Statistics* (2014).