# Barret Schloerke

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## Education

**Purdue University** West Lafayette, Indiana

| PhD of Statistics | Advisors: | Dr. William Cleveland & Dr. Ryan Hafen | Transferred: Spring 2013 Anticipated: Spring 2017 |
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**Purdue University** West Lafayette, Indiana

| Masters of Mathematical Statistics | GPA: 3.69 | Transferred: Spring 2013 Graduated: Fall 2014 |
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**Rice University** Houston, Texas

| Student for PhD of Statistics | Advisor: | Dr. Hadley Wickham | Fall 2012 |
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**Iowa State University** Ames, Iowa

| Bach. of Sci. in Computer Engineering | GPA: 3.77 | Graduated: December 2010 |
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## Honors and Awards

| Award | Description | Date |
|---|---|---|
| Visiting Scientific Researcher | Received full funding for Workshop on Visualization for Big Data: Strategies and Principles | Spring 2015 |
| National Science Foundation Graduate Research Fellowship | 3 year fellowship grant recipient | Spring 2012 |
| Best Dynamic / Interactive Visualization | Data Insight (SF) | June 2011 |
| National Science Foundation Graduate Research Fellowship | Honorable mention | Spring 2011 |
| Magna Cum Laude | Graduate with GPA greater than 3.70 | Fall 2010 |
| Eta Kappa Nu Honor Society | Being in top 25% of class EE/CprE Honor Society | Inducted in Fall 2008 |
| Dean's List | Achieving a 3.5 or above for a semester | Fall 2006 - Fall 2010 |
| Engineering Merit Scholarship | College of Engineering Achieving at least a 3.50 GPA | Fall 2006 - Spring 2010 |
| President's Award for Competitive Excellence | For High School Excellence 2nd in class rank | Fall 2006 - Spring 2010 |

# Publications

## Journal Articles

Emerson, J., W. Green, B. Schloerke, J. Crowley, D. Cook, H. Hofmann, and H. Wickham "The Generalized Pairs Plot." *Journal of Computational and Graphical Statistics* 22.1 (2013). Print.

Hofmann H., D. Cook, C. Kielion, B. Schloerke, J. Hobbs, A. Loy, L. Mosley, D. Rockoff, Y. Huang, D. Wrolstad, and T. Yin "Delayed, Canceled, on Time, Boarding Flying in the USA." *Journal of Computational and Graphical Statistics* 20.2 (2012). Print.

Mosley, L., D. Cook, H. Hofmann, C. Kielion, and B. Schloerke. "Monitoring the 2008 Election Visually." *Chance* 23.3 (2010). Print.

Schloerke, B., H. Wickham, D. Cook, H. Hofmann. "Escape from Boxland: Generating a Library of High-Dimensional Geometric Shapes." *R Journal* In progress. Print.

## Presentations

Schloerke, B. "Cognostics: Metrics enabling detailed interactive visualization of big data" Joint Statistical Meeting. Chicago, IL. Aug. 2016. Speech.

Schloerke, B. "ggduo: Pairs plot for two group data" UseR!2016. Stanford University, Stanford, CA. Jun. 2016. Speech.

Schloerke, B. "GraphQL: An R server implementation". Wombat2016. Melbourne Zoo, Melbourne, VIC AUS. Feb. 2016. Speech.

Schloerke, B. 'Web Scraping with R'" American Credit Acceptance. Spartanburg, SC. Oct. 2016. Speech.

Schloerke, B. 'Trelliscope: D&R visualization tool'" Big Data Visualization. Fields Institute Toronto, CAN. Feb. 2015. Speech.

Schloerke, B. "ggplot2: displaying spatial and temporal data" Spatial Statistics Seminar. Recitation, West Lafayette, IN. Oct. 2014. Speech.

Schloerke, B. "Reducing Working Environment Inefficiencies" Graduate Statistics Seminar. Haas, West Lafayette, IN. Feb. 2014. Speech.

Schloerke, B. "helpr: Help for R." Working Group Meeting. Snedecor Hall, Ames, IA. Sept. 2010. Speech.

Schloerke, B. "GGally: A Plot Matrix for All Variable Types." Joint Statistical Meeting 2010. Vancouver Convention Center, Vancouver, BC Canada. Aug. 2010. Speech.

Quart, G., B. Schloerke, and D. Gannon. "Visualizing Large Data Sets: Housing Crisis." VIGRE. Rice University, Houston, TX. June 2009. Speech.

## Talks

- "Analysis and Visualization of Large Complex Data with Tessera":
  - Purdue Graduate Statistics Seminar - West Lafayette, IN - Apr. 2016
  - Iowa State University Graphics Research Group - Ames, Iowa - Mar. 2016
  - Monash University NUMBAT Seminar - Melbourne, VIC AUS - Feb. 2016

- Purdue working group (2014): "git"

- Bay Area (2011): "Sinartra: Simple Web Framework", "5 Tips for Running Node in Production", "Express: Node Router"

- ISU working group (2008-2010): "Roxygen: Documentation for R", "helpr: Help for R", and "Electoral Towers"

## Research

**Purdue University**

- **GGally::ggduo:** - Spring 2016 - Summer 2016
    - Pairs plot for two group data
    - Extension of ggpairs built on top of a ggmatrix object
    - Readily useful for multiple time series analysis and canonical correlation analysis

- **trelliscopejs:** - Spring 2015 - Present
    - Ported original trelliscope R package to be separated from shiny
    - Full visual implementation in javascript dramatically increases interaction time
    - Utilized React.js javascript platform to produce a single webpage application with multiple URLS

- **Bitcoin:** DARPA XDATA - Summer 2013
    - Brought previous transaction exporter up to protocol
    - Formatted escrow transactions to be matched easier
    - Made "None" keys uniquely identifiable, rather than being treated the same
    - Matched some "None" keys to valid output keys
    - Updated User exporter to include all information available

**Rice University VIGRE Program**

Summer 2009

- Performed exploratory analysis on the housing crisis
- Found, cleaned, and explored multiple data sets
- Created all outputs reproducible from scratch
- Supervised by Dr. Hadley Wickham

**Novartis Pharmaceutical**

Summer 2008

- Created a time management tool using gantt charts to help management quickly display availability.
- Created a web-based tutorial consisting of examples of the most common graphics produced when using different layouts. This allowed users to know exactly how everything was being displayed. (white-box)
- Worked coherently with the top 15 statisticians within Novartis.
- Supervised by Dr. Anthony Rossini and Mentored by Dr. Francois Mercier.

**ISU Statistics Research**

Summer 2007 to Fall 2010

- Supervised by Dr. Dianne Cook and Dr. Heike Hofmann

- **2009 American Statistical Association Data Expo:** Delayed, Cancelled, On-Time, Boarding ... Flying in the USA - Spring 2009
  - Displayed airport delays caused by airport layout using multiple applications.
  - Using Google's KML language, R and wget, we produced Google Earth images with the runways highlighted.
  - Iowa State University working group finished 2nd in the world competition.

- **Election Data:** Explore new ways to show the Electoral College for the 2008 Presidential Election - Fall 2008
  - Created a custom cartogram of the United States with area proportional to the electoral vote of each state.
  - Produced the 'Electoral Vote Towers' (inspired by New York Times 2000 Presidential Race) that quickly portrayed the electoral vote status.

- **DNA:** Viewing DNA sequence data - Fall 2008
  - Extension of the polytope ranking.
  - Created combinations of DNA sequences with a length of four which were displayed in a grand tour.

- **Polytope Ranking:** Visualizing ranked data - Spring 2008
  - Created a model that would connect a ranked data set.
  - Added jittered data points to each combination with the distance relative to the amount of points.

- **FaceOff:** 'Lines and Dots' in the fourth dimension - 2007
  - Game created to calibrate users into viewing and thinking in the fourth dimension.
  - Game is a combination of "Connect 4", "Tic Tac Toe", and "Dots and Lines."

- **IEEE Infovis Competition:** 2007 Infovis visualization competition
  - Internet Movie Data Base (IMDB) competition.
  - Worked on the genres of the database using the "Many Eyes" web application.
  - Helped edit and produce the movie that the working group submitted.

## Work Experience

**Metamarkets - San Francisco, CA**

Software Engineer - Spring 2011 - Summer 2012

| Client-Side | Server-Side |
| --- | --- |
| <ul><li>Developed url framework</li><li>Created the javascript foundation from scratch</li><li>Utilized DVL and D3 to make visualizations and objects data dependant</li><li>Modularized the code to make it useable in multiple locations</li><li>Sped up deployment of code and utilized browser caching</li><li>Minimized calls to backend server to avoid excessive load</li></ul> | <ul><li>Learned and implemented Node.js</li><li>Developed / forked multiple public packages</li><li>Developed user management system</li><li>Developed / utilized user configuration file</li><li>Allowed user configuration to work with self serve process</li><li>Maintained client security</li><li>Implemented custom server cluster to prevent request failure</li><li>Merged multiple data sources per request</li><li>Wrote own security check and error notification system</li></ul> |

## Open Source

**R Packages**

- **GGally** ggplot2's Best Friend - Spring 2010 - Present
  - Re-designed the scatterplot matrix within ggplot2 to handle other variable types
  - Users may submit custom functions to be displayed in the plot matrix
  - Collaborated with over 9 contributing authors
  - $> 10k$ downloads a month
  - Barret Schloerke, Dr. Wickham, Dr. Cook, Dr. Hofmann, Dr. Hafen
  - Iowa State University, Purdue University

- **graphqlr** GraphQL for R - Fall 2015 - Spring 2016
  - Native R GraphQL implementation to be used with Relay.js as a go-between the browser and a R data backend
  - Barret Schloerke, Dr. Hafen
  - Purdue University

- **rbokeh** R interface to Bokeh - Fall 2015
  - Utilized non-standard evaluation within package to remove massive amounts of boilerplate
  - Barret Schloerke, Dr. Hafen
  - Purdue University

- **cranvas** New Plotting Canvas for R - 2010

- New plotting canvas for R. Produces more than a million points in less than a second.
- Dr. Wickham, Dr. Lawrence, Dr. Hoffman, Dr. Cook, Yihui Xie, Tengfei Yin, Marie Vendettuoli, Barret Schloerke
- Iowa State University

- **helpr** Help for R - Summer 2010
  - Betters Friendly HTML documentation with links to other packages, function aliases, and function sources. Finding information may be done with the comprehensive search bar.
  - Barret Schloerke, Dr. Wickham
  - Rice University and Revolution Analytics

- **DescribeDisplay** Reproduce GGobi images in R - Fall 2009
  - Produce publication quality graphics from GGobi's describe display plugin.
  - Barret Schloerke
  - Iowa State University

- **tourr** Geodesic interpolation and basis generation functions - Fall 2009
  - Implements geodesic interpolation and basis generation functions that allow you to create new tour methods in R.
  - Dr. Wickham, Dr. Cook, Barret Schloerke
  - Iowa State University and Rice University

- **GeoZoo** A library of high dimension geometric objects - 2007
  - Functions to produce cubes, spheres, simplices, polyhedra, polytops, tori, and mobius-like objects. Contains a new addition to the high dimension polytopes, a Hyper Ring Torus
  - Barret Schloerke, Dr. Cook
  - Iowa State University

**Node.js / Javascript**

- **yalog** Yet Another Logger - 2012
  - Request logger to allow for personalized logging messages within different log levels
  - Barret Schloerke

- **DVL** Data Visualization Legos - 2011-2012
  - Functionally reactive javascript library to bind data to functions and visualizations
  - Vadim Ogievetsky, Barret Schloerke

**Interface**

- **R-Touch:** R on the iPod Touch / iPhone - 2009
  - Application allows the user to perform on-the-fly coding, produce images, download data from the Internet, restore old code files, and save current executed code. The coding session may then be viewed on a computer using the session ID.
  - Barret Schloerke, Chris Kielion
  - Iowa State University

## Websites

- **Checkin System** Implemented a database management system for Iowa State's Greek Olympics (2010 - 2015) and Iowa State's Homecoming Blood Drive (2012-2013) to keep tabs on participants. Allowed for an average checkin time of 1 person every 2 seconds over a two hour period.

- **Helpr** Helpr R package is written using sinartra which allows for embedding R in HTML when the page is generated. 2010

- **Senior Design** Senior Design project description with links to meeting minutes and team documents. 2010

- **Election Maps** Election Maps includes two sections: Cartogram of the USA and Electoral Vote Towers. 2009

- **Novartis Toolbox** Toolbox designed for generating standard statistical graphics in R. The mission of the website is to give the user the tools to learn basic and advanced Lattice skills through examples. 2008

- **GeoZoo** GeoZoo was created to help the viewer's eyes calibrate to high dimensions. GeoZoo contains many data sets of high dimensional geometric shapes. 2007

- **FaceOff** FaceOff's video and PDF tutorial. 2007

## Personal Contacts

- Dr. William Cleveland. wsc@purdue.edu

- Dr. Ryan Hafen. rhafen@gmail.com

- Dr. Hadley Wickham. h.wickham@gmail.com

- Dr. Dianne Cook. dicook@monash.edu

- Dr. Heike Hofmann. hofmann@iastate.edu

- Dr. Michael Driscoll. mike@metamarkets.com