

AMELIA A. MCNAMARA

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RESEARCH INTERESTS

Statistical computing, statistics education, data visualization, reproducible research, spatial statistics

EDUCATION

Ph.D., Statistics 2015

University of California - Los Angeles Los Angeles, CA

Dissertation: Bridging the Gap Between Tools for Learning and for Doing Statistics

Committee: Robert Gould and Fredrick Paik Schoenberg (co-chairs, statistics), Mark Hancock (statistics), Todd Millstein (computer science), Alan Kay (computer science).

B.A., Mathematics and English 2010

Macalester College St. Paul, MN

ACADEMIC APPOINTMENTS

Visiting Assistant Professor 2015-2019

Smith College Program in Statistical and Data Science Northampton, MA

MassMutual Faculty Fellow

AWARDS

Teaching Integrity in Empirical Research Faculty Fellow, Haverford College 2015-2016

Collegium of University Teaching Fellows, University of California, Los Angeles 2014-2015

Dissertation Year Fellowship, University of California, Los Angeles 2014-2015

Graduate Research Fellowship Program, National Science Foundation 2012

Chancellor's Prize Summer Fellowship, University of California, Los Angeles 2011-2012

Konhauser Prize for Mathematical Achievement, Macalester College 2010

RESEARCH AND CONSULTING

Smith College, Northampton, MA 2015-present

Visiting Assistant Professor

At Smith College, my research program is focused on statistics education, statistical computing, data visualization, and spatial statistics. In Spring 2016 and Spring 2017, I led groups of undergraduate and post-baccalaureate students as part of the MTH 301 independent research seminar. We focused on Methods to Address the Change of Support and Modifiable Areal Unit Problems.

The Concord Consortium, Emeryville, CA September 2016-March 2017

Consultant

Worked with William Finzer and the Common Online Data Analysis Platform (CODAP) on integrating 'Data Science Moves' into CODAP.

Viewpoints Research Institute, Los Angeles, CA September 2016-January 2017

Consultant

Continued collaboration with Aran Lunzer to develop interactive essays related to the impacts of data aggregation in 1- and 2-D.

Viewpoints Research Institute, Los Angeles, CA

2013-2015

Graduate Intern

The Viewpoints Research Group is a research group with a variety of interests including the future of programming, internet-scale computing, and programming language design. I collaborated with other researchers on projects to improve statistical computing tools for novices (those with no statistics or programming experience). Examples include **LivelyR** with Aran Lunzer and **locatr** with Ted Kaehler. Director: Alan Kay.

Mobilize Project, Los Angeles, CA

2011-2014

Graduate Student Researcher

The Mobilize project brings data analysis and statistics to life by allowing high school students to collect information about the world around them using mobile phones, then analyze the data and do something with it. As a graduate student researcher, I developed curriculum to be deployed in LAUSD public high schools, including the innovative Introduction to Data Science course. Over hundreds of hours of professional development, I trained teachers on basic statistical concepts, use of inquiry in teaching, and basic statistical software. Principal Investigator: Rob Gould.

PEER-REVIEWED PUBLICATIONS

McNamara, A., and Horton, N. J. **Wrangling Categorical Data in R.**

In Practical Data Science for Stats, *PeerJ Preprint Collection*, 5:e3163v2. (2017).

To appear in special issue of *The American Statistician*. Vol. 7, Issue 3. (in press)

Lunzer, A., and **McNamara, A.** **Exploring Histograms:** Interactive essay. Available online at <http://tinlizzie.org/histograms/>. (2017). (submitted)

McNamara, A. **Key Attributes of a Modern Statistical Computing Tool.** (submitted)

McNamara, A., Gould, R., Wild, C. J., Baglin, J., Ridgway, J., McConway, K, “Revolutions in Teaching and Learning Statistics: A Collection of Reflections” in *Springer International Handbook of Research in Statistics Education* (Ben-Zvi, D., Makar, K., eds), Springer International Handbook of Education series. (in revision)

McNamara, A. **Community Engagement and Subgroup Meta-Knowledge: Some Factors in the Soul of a Community.** *Computational Statistics*. (in press)

Catllá, A.J., **McNamara, A.** and Topaz, C. M. **Instabilities and Patterns in Coupled Reaction-Diffusion Layers.** *Physical Review E*, Vol. 85, Issue 2. (2012).

OTHER WRITING

McNamara, A., Horton, N. J., and Baumer, B. S. **Greater Data Science at Baccalaureate Institutions.** Invited comment as part of discussion for David Donoho’s 50 Years of Data Science. *Journal of Computational and Graphical Statistics*. (in press).

McNamara, A. **Barriers and Opportunities for Nurturing Statistical Thinking before College** *CHANCE*, Vol. 28, Issue 4. (2015).

McNamara, A. and Hansen, M. **Teaching Data Science to Teenagers.** *Proceedings of the 9th International Conference on Teaching Statistics*. (2014).

McNamara, A. **Dynamic Documents with R and knitr** (book review). *Journal of Statistical Software*, Vol. 56, Book Review 2. (2014).

IN PROGRESS

McNamara, A. **On the State of Computing in Statistics Education: Tools for Learning and for Doing.**

McNamara, A., student coauthors to be determined. **Interactive methods to address the change of support problem.**

Molyneux, J., and *McNamara, A.* **mobilizr: An R package for high school data scientists.**

TEACHING

Smith College Program in Statistical and Data Sciences
SDS 136: **Communicating with Data** Fall 2017
SDS/MTH 220: **Introduction to Statistics and Probability** (lecture) Fall 2015, Spring 2016
SDS/MTH 220: **Introduction to Statistics and Probability** (lab) Fall 2015, Spring 2016
SDS/MTH 291: **Multiple Regression** Spring 2016, Fall 2016

MassMutual Data Science Development Program
Data visualization seminar (with Jordan Crouser) Summer 2016, Summer 2017

University of California, Los Angeles Statistics Department 2013-2015
STAT 98T: **Data Visualization** (Instructor of record, Collegium of University Teaching Fellows)
STAT 101A: **Introduction to Data Analysis and Regression** (Teaching fellow)
STAT 102B: **Introduction to Computation and Optimization** (Teaching fellow)
STAT 101C: **Introduction to Regression and Data Mining** (Teaching fellow)

Mobilize Project Professional Development Program 2011-2014
Professional Development: **Exploring Computer Science** (Leader)
Professional Development: **Math and Science** (Leader)
Professional Development: **Introduction to Data Science** (Leader)

SHORT COURSES AND WORKSHOPS LED

Intro to R & RStudio January 2018
rstudio::conf *San Diego, CA*

Master the Tidyverse (TA for Garrett Grolemond) October 2017
RStudio workshop *Washington, DC*

statPREP workshop June 2017
St. Catherine University *St. Paul, MN*

Data Science for Statisticians March 2017
ENAR, International Biometric Society Meeting *Washington, DC*

Introduction to R (with Coulter Jones) March 2016
NICAR, Investigative Reporters & Editors Conference *Denver, CO*

INVITED TALKS

Interfacing with Data September 2017
Data Literacy Conference *Aix-en-Provence, France*

Key Attributes of a Modern Statistical Computing Tool March 2017
Tableau Software *Seattle, WA*

Using Data Visualization to Find Patterns in Multidimensional Data St. Olaf College	March 2017 <i>Northfield, MN</i>
Bridging the Gap Between Tools for Learning and for Doing Statistics University of Minnesota	November 2016 <i>Minneapolis, MN</i>
Bridging the Gap Between Tools for Learning and for Doing Statistics University of Massachusetts - Amherst	March 2016 <i>Amherst, MA</i>
Statistical Programming– Past, Present, and Future California State University, Fullerton	December 2014 <i>Fullerton, CA</i>

CONFERENCE PRESENTATIONS

How Spatial Polygons Shape Our World OpenVisConf	April 2017 <i>Boston, MA</i>
The Incredible Importance of Variability THINK Conference	November 2016 <i>Bay Area, CA</i>
Pushing the Boundary Between Tools for Learning and for Doing Statistics Joint Statistical Meetings	August 2016 <i>Chicago, IL</i>
The Importance of Parameter Manipulation for Statistics Society for Industrial and Applied Mathematics Annual Meeting	July 2016 <i>Boston, MA</i>
Integrated R Labs for High School Students useR! The R User Conference	June 2016 <i>Stanford, CA</i>
The Gap Between Tools for Learning and for Doing Statistics Electronic Conference on Teaching Statistics	May 2016 <i>electronic</i>
Do you know Nothing when you see it? OpenVisConf	April 2016 <i>Boston, MA</i>
Using Data Visualization to Find Patterns in Multidimensional Data Big Data Day LA	June 2015 <i>Los Angeles, CA</i>
Teaching Data Science to Teenagers (invited talk, with M. Hansen) International Conference on Teaching Statistics	July 2014 <i>Flagstaff, AZ</i>
Teaching R to High School Students (with J. Molyneux) useR! The R User Conference	July 2014 <i>Los Angeles, CA</i>
LivelyR: Making R Charts Livelier (with A. Lunzer) useR! The R User Conference	July 2014 <i>Los Angeles, CA</i>
Mobilize Project (with J. Margolis and L. Trusela) Math Science Partnership Learning Network Conference	January 2012 <i>Washington, DC</i>
Model and Optimization of Organic Photovoltaic Cells Joint Meeting of AMS and MAA	January 2010 <i>San Francisco, CA</i>

PANELS AND ROUNDTABLES

Data Science at Women's Colleges (panelist) Women in Statistics and Data Science Conference (WSDS)	October 2017 <i>San Diego, CA</i>
Local Data Science Panel Presentation (panelist) Women in Data Science (WiDS) satellite conference, Mt Holyoke College	February 2017 <i>South Hadley, MA</i>
Graphics Software: Favorites and Best Practices (roundtable leader) Joint Statistical Meetings	August 2016 <i>Chicago, IL</i>
Implications for Curriculum (panelist) Alliance to Advance Liberal Arts Colleges (AALAC) Big Data Workshop	January 2016 <i>Wellesley, MA</i>
heR Panel Discussion (panelist) useR! The R User Conference	July 2014 <i>Los Angeles, CA</i>

POSTER PRESENTATIONS

Pushing the Boundary Between Tools for Learning and for Doing Statistics Joint Statistical Meetings	August 2016 <i>Chicago, IL</i>
It Ain't Necessarily So: Checking Charts for Robustness (with A. Lunzer) IEEE Vis Conference	November 2014 <i>Paris, France</i>
Tools for Teaching Data Science Women in Statistics Conference	May 2014 <i>Cary, NC</i>
Data Visualization on the Soul of the Community Joint Statistical Meetings	August 2013 <i>Montreal, QC</i>
Model and Optimization of Organic Photovoltaic Cells Joint Meeting of AMS and MAA, San Francisco, CA	January 2010
Undergraduate Research Symposium, University of Chicago	November 2009
Macalester College, St. Paul, MN	October 2009
Institute for Mathematics and its Applications, Minneapolis, MN	July 2009

INVITED WORKSHOPS AND HACKATHONS

Evidence About Programmers for Programming Language Design Schloss Dagstuhl	February 2018 <i>Wadern, Germany</i>
Teaching Integrity in Empirical Research Workshop Haverford College	June 2017 <i>Haverford, PA</i>
rOpenSci hackathon CrossCampus	May 2017 <i>Los Angeles, CA</i>
Designing for Uncertainty in HCI CHI Conference	May 2017 <i>Denver, CO</i>
Moving Transparent Statistics Forward CHI Conference	May 2017 <i>Denver, CO</i>

Youth, Learning and Data Science Summit
University of California, Berkeley

August 2016
Berkeley, CA

Teaching Integrity in Empirical Research Workshop
Haverford College

June 2016
Haverford, PA

rOpenSci hackathon
GitHub

March 2014
San Francisco, CA

LOCAL CONTRIBUTIONS

Algorithmic Accountability

Otelia Cromwell Day workshop, Smith College

November 2017

Big Data, Polling, and the Politics of Education

Guest lecture in AMS 100: Thinking Through the 2016 Election

March 2017

What's Missing? Identifying the Gaps, Biases, and Omissions in Digital Data

Guest lecture in IDP 160: Digital Effects, Smith College

October 2016

Futurisms, part II: Intersections: Digital Humanities, Interactive Media and Cultural Heritage (faculty fellow)

Smith College Kahn Institute

February 2016

Futurisms, part I: The Ten Thousand Year Collection (faculty fellow)

Smith College Kahn Institute

December 2015

Using Data Visualization to Find Patterns in Multidimensional Data

Guest lecture in CS 342: Statistical Learning, Hampshire College

November 2015

Using Data Visualization to Find Patterns in Multidimensional Data

Western Mass Data Science, Stats, and R Meetup, Amherst, MA

November 2015

Eyeo Highlights

Datavis LA Meetup, Los Angeles, CA

August 2014

SERVICE TO DEPARTMENT, PROFESSION, AND COLLEGE

Smith College Statistical and Data Sciences Program Committee

2015-present

Faculty member

- Assisted in developing the major in Statistical and Data Sciences (approved April 2016).
- Voted on departmental policy about honors theses, special studies, course waivers, and the like.
- Organized invited talk by Amanda Cox (long time member of the graphics team at The New York Times, now editor of The Upshot), attended by almost 200 people from the college and community.
- Organized invited talk by Christine Zhang '09 (alumna and recipient of 2016 Mozilla Open News Fellowship, data journalist at the LA Times), attended by approximately 100 people from the college and community.
- Managing Twitter presence @SmithCollegeSDS.

Women in Statistics and Data Science Conference (WSDS) San Diego, CA

2017

Panel chair

- WSDS R-Ladies Panel: Improving Gender Diversity in a Male-Dominated Community

Joint Statistical Meetings Chicago, IL

2016

Session Chair

- Toward Better Communication of Information with Statistical Graphics – Contributed Papers
- Reproducibility in Statistics and Data Science – Invited Papers (substitute chair)

Five College DataFest

2015-present

Co-organizer with Ben Baumer

- Planned and executed the 2016 and 2017 FiveCollege DataFests
- DataFest is a weekend-long data hackathon event for more than 100 undergraduate students from Smith, Mt Holyoke, Hampshire, Amherst, and UMass Amherst.
- Managed social media, including Wordpress website and Twitter presence @FiveCollegeStat.
- Recruited data science experts to serve as VIP visitors and judges.
- Solicited donations from corporations like Google and RStudio.
- Coordinated prizes and swag for students.

University of California, Los Angeles DataFest

2011-2015

Planning Member

- As a graduate student, assisted in planning and executing the 2012, 2013, 2014, and 2015 UCLA DataFests for undergraduates, attended by 100-200 undergraduate students from UCLA, the University of Southern California, Pomona College, California Polytechnic State University San Luis Obispo, and the University of California, Riverside.
- Managed Twitter presence @UCLADataFest.
- Served as on-the-ground-advisor for students at the event, discussing ideas and coding issues.
- Assisted in coordinating donations and swag from corporations like GitHub, Google, Revolution Analytics, and RStudio.

Los Angeles useR! Conference Organizing Committee

2013-2014

Planning Member

- Assisted in planning and executing the 2014 international R user conference (700 attendees).
- Recruited and coordinated 80 student volunteers.
- Assisted with conference website before, during, and after the conference.
- Promoted conference on social media, encouraged minority participation.
- Supervised on-the-ground conference logistics, including registration, catering, and facilities services.

UCLA Graduate Student Orientation Planning Committee

2012-2013

Tour Coordinator

- Helped plan and execute the 2012 and 2013 UCLA grad student orientations, attended by 1,000+ incoming graduate students each year.
- Discussed general orientation issues, such as panel topics and logistical concerns.
- Organized and trained 15 volunteer tour guides to lead tours campus.
- Prepared tour materials and checked routes for North Campus, South Campus, and General tours.
- On the day of orientation, coordinated hourly tours and assigned tour guides to routes.

Macalester College Admissions

2013-present

Volunteer interviewer and college representative

- Performed alumni interviews of prospective students applying to Macalester in Southern California and Western Massachusetts
- Represented Macalester at the 2015 Vistamar College Fair, answering questions about Macalester and the admissions process

Southern California AP Statistics Poster Competition 2014
 Judge
 · Judged entries to the 2014 Southern California AP Statistics Poster Competition

UC Day in DC May 2013
 University of California, Los Angeles Delegate
 · Represented UCLA and graduate student interests at the University of California’s annual federal advocacy day in Washington, DC.
 · Met with congress members and their staff to discuss Federal funding for programs impacting grad students.

UCLA Graduate Resource Center Oversight Committee 2011-2012
 Voting Member
 · Assisted in developing a new strategic plan for UCLA’s graduate resource center

Ad-hoc referee 2014-present
 Journals:
 · Journal of Statistics Education (JSE)
 · Journal of Statistical Software (JSS)
 · Statistics Education Research Journal (SERJ)
 · Technology Innovations in Statistics Education (TISE)
 · The American Statistician (TAS)

Ad-hoc referee 2017-present
 Conferences:
 · Conference on Human Factors in Computing Systems (CHI)

SKILLS

Languages Expert: R, L^AT_EX, HTML, Markdown
 Intermediate: Spanish, Python, git, JavaScript, Matlab, Mathematica, ArcGIS

Social Media Twitter: @AmeliaMN, 6,400+ tweets, 4,400+ followers
 Currently managing @SmithCollegeSDS, @FiveCollegeStat
 Formerly managed @UCLADataFest, @user2014_UCLA

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

American Statistical Association (ASA) 2012-present

Society for Industrial and Applied Mathematics (SIAM) 2012-present

Association for Women in Mathematics (AWM) 2008-2010, 2014-present

Institute of Electrical and Electronics Engineers (IEEE) 2016-present

WNAR: International Biometric Society (WNAR) 2013-2014