Shannon Gallagher

Curriculum Vitae

Education

2014–2019 **PhD in Statistics and Data Science**, *Carnegie Mellon University*.

2014-2015 **MS in Statistics**, *Carnegie Mellon University*.

2010–2014 **BS in Mathematical Sciences**, *Carnegie Mellon University*.
University and College Honors

Dissertation

Expected 2019 "Catalyst: agents of change. Building a better hybrid model to predict the spread of infectious disease." Advisor: William F. Eddy. Committee: Joel Greenhouse, Howard Seltman, Cosma Shalizi, and Samuel L. Ventura.

Publications and Reports

2018 Gallagher, S., Richardson, L., Ventura, S.L., and Eddy, W.F. "SPEW: Synthetic Populations and Ecosystems of the World." To appear in *Journal of Computational and Graphical Statistics*, 2018.

2018 Gallagher, S. and Eddy, W.F. "On the stochastic equivalence of compartment and agent-based models." Submitted, 2018.

2018 Gallagher, S., Chang, A., and Eddy, W.F. "21 dubious ways to estimate R_0." In preparation, 2018.

2017 Gallagher, S. "Comparing compartment and agent-based models." Proposal Document, 2017.

2016 Gallagher, S., Rosenfeld, R., Eddy, W.F., and Tibshirani, R.J. *Prediction Fever: Modeling Influenza with Regional Effects*. Advanced Data Analysis Report, 2016.

Selected Presentations and Posters

2017 "Comparing Compartment and Agent-based Models." Presentation. Advisor: William F. Eddy. Committee: Joel Greenhouse, Howard Seltman, Cosma Shalizi, and Samuel L. Ventura. Joint Statistical Meetings. Baltimore, MD.

2017 "Generating Synthetic Ecosystems: A Tutorial". **Invited presentation.** Joint work with Lee Richardson, Samuel Ventura, and William Eddy. International Conference on Synthetic Populations. Lucca, Italy.

2016 "Women in Statistics at Carnegie Mellon University." Joint work with Purvasha Chakravarti. Presentation. Women in Statistics and Data Science. Charlotte, NC.

2016 "Statistical Modelling of Infectious Diseases: Influenza and the 'Next Disease.'" Poster. Joint work with Roni Rosenfeld, Ryan Tibshirani, Lee Richardson, Samuel Ventura, and William Eddy. Women in Statistics and Data Science. Charlotte, NC.

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2016 "Services for the MIDAS Network: Visualization and Synthetic Ecosystems." Poster. Joint work with Lee Richardson, Samuel Ventura, and William Eddy. MIDAS National Conference. Washington D.C.

2016 "From Forecasting the Flu to Predicting the 'Next' Disease." Poster. Joint work with Roni Rosenfeld, Ryan Tibshirani, Lee Richardson, Samuel Ventura, and William Eddy. UP-STAT. Buffalo, NY.

Software

2018-Present `catalyst`: Compartment and Agent-based model Temporal Analysis and Testing. In development.

2016-Present `spew`: `R` package for synthetic ecosystem generation. Lee Richardson, Shannon Gallagher, Samuel L. Ventura, and William F. Eddy. Available on `CRAN`.

2017 `spew_dl`: `R` Shiny application to easily browse our synthetic ecosystems produced by `spew`. Shannon Gallagher, Lee Richardson, Samuel L. Ventura, and William F. Eddy.

2016 `spewview`: `R` Shiny application for infectious disease visualization. Shannon Gallagher and Lee Richardson.

Honors and Awards

2017 AT&T Labs Graduate Student Symposium Selected Presenter. One of fourteen PhD students out of 79 applicants selected to give a presentation on ongoing research to AT&T researchers in NYC. **Awarded $800** in travel funding.

2016 MIDAS MISSION Public Health **Hackathon Champion**.

2016 UP-STAT **2nd Place Student** Presentation.

2014 Gertrude M. Cox Scholarship Honorable Mention; ASA Committee on Women in Statistics and the Caucus for Women in Statistics.

2014 Judith A. Resnik Award for Outstanding Women in the Sciences; Carnegie Mellon University.

2013 Phi Beta Kappa Honor Society.

Research, Teaching, and Work Experience

2014-Present **Research Assistant,** Carnegie Mellon University. Generated high-resolution synthetic ecosystem of U.S. and 70+ countries for use in agent-based models for transmission of disease.

2012-Present **Teaching Assistant**, Carnegie Mellon University. Oversaw lab for 100 students, organized, and led review sessions for a variety of statistics and mathematics classes including Epidemiology, Statistical Computing, Intro to Probability, Advanced Undergraduate Research, Concepts of Mathematics, and Calc 3D.

2015 **Graduate Intern**, PNC. Scraped and analyzed social media data for sentiment analysis. Parallelized code with Hadoop.

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Programming Languages

`R` (expert), `julia` (proficient), `Python` (intermediate), `C++` (intermediate), `C` (intermediate), `SQL` (some experience), `jekyll` (some experience)

Professional Service

2017-Present **Co-President**. Carnegie Mellon University Women in Statistics.

- Organized Women in Data Science Pittsburgh @CMU as an Executive Committee Member. Invited speakers and sponsors, helped organize venue logistics, sent out invitations for attendance, and created the website (2018).
- Maintained Women in Statistics website (2017-Present).
- Organized a seminar by a former PhD student about her experiences as a post-doc at Harvard Biostatistics (2017).
- Organized a panel about applying to graduate school for 30+ undergraduate and masters students (2017).
- Organized dinner with new dean of Mellon College of Science (2017).

2016-Present **Co-Organizer**. Pittsburgh use`R`. Organized meet-ups for 30+ members on a variety of topics including cross-language coding and integrating `R` with `github`.

2016-Present **Reviewer**. Statistics in Medicine and Journal of Quantitative Analysis in Sports.

2016-Present **Judge and volunteer**. Tartan Data Science Cup – 3 to date.

2016-2017 **Vice President**. Carnegie Mellon University Women in Statistics

2016 **Presenter**. Coding for Girls.

Relevant Course Work

- Machine Learning I & II (**Grad**)
- Statistical Computing (**Grad**)
- Modern Regression (**Grad**)
- Hierarchical Models (**Grad**)
- Multivariate Methods & Data Mining
- Data Matching and Record Linkage
- Advanced Methods for Data Analysis
- Epidemiology

Volunteering

2017-Present **Stat Help Network**. Hold anonymous "office hours" for graduate students within the Statistics and Data Science Department in order to support students.

2016-Present **Family House**. Make meals for families with members in the hospital approximately every other month.

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