Shannon **Gallagher**

Statistician · Ph.D.

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Current

National Institute of Allergy and Infectious Diseases — *Rockville, MD*

Biostatistics Research Branch | Department of Clinical Research — *2019-2021*

Post-Doctoral Fellow

Education

Carnegie Mellon University — *Pittsburgh, PA*

Ph.D. in Statistics — *2014-2019*

M.S. in Statistics — *2014-2015*

B.S. in Mathematical Sciences (University and College Honors) — *2010-2014*

Dissertation: "Catalyst: agents of change. Integration of compartment and agent-based models for use in infectious disease methodology"

Advisor: William F. Eddy

Selected Publications and Reports

Azasi, Y.†, **Gallagher, S.**†, [and 11 others including Fay, Michael P., Miura, K., and Miller, Louis H.] († co-first author). "Evaluating the efficacy of AMA1-RON2, RH5, RIPR and CyRPA antibody combinations in inhibiting growth of *P. falciparum*." In preparation, 2020.

Gallagher, S. and Leroy, B. "Streamlining the comparison of epidemic models." In preparation, 2020.

Gallagher, S., Chang, A., Eddy, W.F.. "Eight ways to estimate R_0 in the SIR model." In preparation, 2020.

Gallagher, S., Frisoli K., and Luby, A. "Opening up the court (surface) in tennis grand slams." Accepted with major revisions to *Journal of Quantitative Analysis in Sports*, 2019.

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

Selected Presentations and Posters

ENAR — *Virtual Conference*

Presentation — *March, 2020*

"A Hybrid Compartment/Agent-Based Model for Infectious Disease Modeling"

George Washington University — *Washington D.C.*

Guest Lecture — *February, 2020*

"A brief survey of statistical models to analyze the transmission of infectious diseases"

Dissertation Defense — *Pittsburgh, PA*

Presentation — *July 2019*

"Catalyst: agents of change. Integration of compartment and agent-based models for use in infectious disease epidemiology."

Carnegie Mellon Sports Analytics Conference — *Pittsburgh, PA*

Presentation – **Honorable Mention** — *October 2018*

"Opening up the (court) surface in tennis grand slams." Joint work with Kayla Frisoli and Amanda Luby.

International Conference on Synthetic Populations — *Lucca, Italy*

Presentation – **Invited Speaker** — *February 2017*

"Generating Synthetic Ecosystems: A Tutorial" Joint work with Lee Richardson, Samuel Ventura, and William Eddy.

MIDAS National Conference — *Washington D.C.*

Presentation — *May 2016*

"Services for the MIDAS Network: Visualization and Synthetic Ecosystems." Joint work with Lee Richardson, Samuel Ventura, and William Eddy.

UP-STAT *Buffalo, NY*

PRESENTATION – **2ND PLACE** *March 2016*

"From forecasting the Flu to Predicting the 'Next' Disease." Joint work with Roni Rosenfeld, Ryan Tibshirani, Lee Richardson, Samuel Ventura, and William Eddy.

Honors & Awards

2018	**Honorable Mention,** Carnegie Mellon University Sports Analytics Conference Reproducible Paper Competition. $1,000 award.	*Pittsburgh, PA*
2018, 2014	**Honorable Mention,** Gertrude M. Cox Scholarship. ASA Committee on Women in Statistics and the Caucus for Women in Statistics.	
2018	**Scholarship Recipient,** Summer Institute in Statistics and Modeling. Tuition and travel stipend.	*Seattle, WA*
2017	**Selected Presenter,** AT&T Labs Graduate Student Symposium. One of fourteen PhD students out of 79 applicants selected. Awarded $800 in travel funding	*New York, NY*
2016	**Hackathon Champion,** MIDAS MISSION Public Health Hackathon. Awarded $3,000 prize.	*Pittsburgh, PA*
2016	**2nd place,** Student presentation at UP-STAT conference.	*Buffalo, NY*
2014	**Judith A. Resnik Award for Outstanding Women in the Sciences,** Carnegie Mellon University	*Pittsburgh, PA*
2013	**Phi Beta Kappa Honor Society,** Fall induction.	*Pittsburgh, PA*

Software

2020	`TBornotTB`, **Gallagher, S.** and Follmann, D.. Simulation, analysis, and visualization of covariate-dependent branching processes. Available at `www.github.com/skgallagher/TBornotTB`.
2019-2020	`loewesadditivity`, **Gallagher, S.** and Fay, M. P.. Software for modelling synergy, antagonism, or Loewe additivity between varying dose combinations of different compounds. Available at `www.github.com/skgallagher/loewesadditivity`.
2019-2020	`EpiCompare`, **Gallagher, S.** and Leroy, B.. Software for simulation and analysis of disease data via ternary plots. Available at `www.github.com/skgallagher/EpiCompare`.
2019	`catalyst`, **Gallagher, S.**. Software for simulation, testing, and analysis of compartment and agent-based models. Available at `www.github.com/skgallagher/catalyst`.
2018	`spew`, Richardson L., **Gallagher, S.**, Ventura, S., and Eddy, W.F.. `R` package for synthetic ecosystem generation. Available at `www.github.com/lrichardson/spew`.
2016	`spewview`, **Gallagher, S.** and Richardson L.. `R` Shiny application for infectious disease visualization. Available at `www.github.com/skgallagher/hackathon`.

Research, Teaching, and Work Experience

National Institute of Allergy and Infectious Disease *Rockville, MD*

POST-DOCTORAL FELLOW *2019-2021*

- Worked with Dean Follmann to analyze the effect of smear status on spread of Tuberculosis
- Devised and implemented statistical model to analyze the synergy of antibody pair combinations for Malaria vaccine efforts

Carnegie Mellon University *Pittsburgh, PA*

RESEARCH AND TEACHING ASSISTANT *2014-2019*

- Developed and presented material for the Summer Undergraduate Research Experience in Statistics.
- Generated high-resolution synthetic ecosystem of the U.S. and 70+ countries for use in agent-based models for transmission of disease.
- 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 Multi-dimensional Calculus.

PNC *Pittsburgh, PA*

GRADUATE INTERN *2015*

- Scraped and analyzed social media data for sentiment analysis.
- Parallelized code via Hadoop

Professional Service

2016-PRESENT	**Reviewer,** Statistics in Medicine and Journal of Quantitative Analysis in Sports
2018-2019	**PI,** ProSeed/Crosswalk recipient for $1600 to seed a mentorship program across all levels of students within the Stat&DS community.

President, Carnegie Mellon University Women in Statistics.

2018-2019
- Organized Women in Data Science Pittsburgh @CMU as an Executive Committee Member. Inivted speakers and sponsors, helped organize venue logistics, sent out invitations for for attendance, and created the 2018 website.
- Maintained the Women in Statistics Website from 2017-2018.
- Organized a seminar by 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 (2016).
- Organized dinner with new dean of Mellon College of Science (2016).

2016-2018 **Co-Organizer,** Pittsburgh useR. Organized meet-ups for 30+ members on a variety of topics including cross-language coding and integrating `R` with `github`.

2016-2017 **Judge and volunteer,** Tartan Data Science Cup - three separate events.

2016-2017 **Vice President,** CMU Women in Statistics.

2016 **Presenter,** Coding for Girls

Relevant Course Work

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

Volunteering

Family House

Volunteer *2016-2019*

Made meals for families with members in the hospital approximately every other month

Stat Help Network

Volunteer *2016-2019*

Held anonymous “office hours” for graduate students within the Statistics & Data Science Dept. in order to support students.