

# SHANNON GALLAGHER

Data Scientist, Statistician, PhD

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📍 North Bethesda, MD

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## WORK EXPERIENCE

Post Doctoral Fellow

National Institute of Allergy and Infectious Diseases, NIH

📅 Aug 2019 – Present

📍 Rockville, MD

- Led analysis for retrospective study of effect of remdesivir on COVID-19 patients in the ACTT-1 Trial
  - Used LASSO and Random Forest for variable selection
  - Implemented Fine-Gray competing event analysis to determine a prognostic score of patient outcome when there is no treatment
  - Tested whether remdesivir is effective after balancing for prognostic score to account for imbalance of features
- Developed an R package `InfectionTrees`, accompanying website, and manuscript (under review) studying the effect of HIV status and detection time on the probability of infection of clusters of Tuberculosis outbreaks
- Implemented and maintained an R `Shiny` app to aid researchers in development of malaria vaccine (<https://additivity.niaid.nih.gov/>)
- Created lecture material for epidemic modeling and programming in R

Parallel computing

Shiny

R

algorithms

PhD Student

Carnegie Mellon University

📅 June 2014 – Aug 2019

📍 Pittsburgh, PA

- Researched statistical relationships between compartment models (CM) and agent-based models (AM)
  - Proved equivalence between CMs and AMs under some conditions
  - Derived guidelines for hybrid CM-AM epidemic models
- Published, programmed, and refined R package `spew` and manuscript to aid researchers in creating synthetic ecosystems to improve study in infectious disease epidemiology
- Delivered invited presentation about synthetic ecosystem creation at an international conference in Lucca, Italy
- Optimized code for high performance computing on a supercomputer
- Developed and presented material for Summer Undergraduate Research Experience in Statistics
- Oversaw lab for 100 students, organized and led review sessions for a variety of statistics and mathematics classes

Graduate Intern

PNC

📅 Summer 2015

📍 Pittsburgh, PA

- Scraped and analyzed social media data for sentiment analysis to determine effect of social media engagement
- Parallelized code via Hadoop

Hadoop

sparklyr

Director's Summer Program Participant

NSA

📅 Summer 2012

📍 Fort Meade, MD

- Implemented algorithm for quantum computing resource allocation
- Presented results to Director of NSA

C++

presentations

## EDUCATION

PhD of Statistics, 2019

MS of Statistics, 2015

BS of Mathematical Sciences, 2014

Carnegie Mellon University

📅 2010 – 2019

📍 Pittsburgh, PA

## ACHIEVEMENTS



**2020 Commencement Speaker**

Selected student speaker at the 2020 Conferral of Degrees.



**Selected Presenter for AT&T Labs Graduate Student Symposium**

One of fourteen PhD students out of 79 applicants selected.



**Hackathon Champion**

Developed interface for infectious disease visualization at the MIDAS MISSION Public Health Hackathon. Awarded \$3,000 prize.

## SKILLS

R (Expert)

- Package creation, debugging & development
- See `EpiCompare`, `InfectionTrees`, and `spew`

R Shiny (Advanced)

- Online apps for visualization and communication of statistical results

RMarkdown and  $\LaTeX$  (Advanced)

- Creation of dynamic and transportable text
- Automated report generation for synthetic population summaries

Hadoop, `foreach`, `qsub` (Intermediate)

- High performance and distributive computing

C++, Python, Julia, MatLab (Proficient)

- Programming experience ( $\geq 1$  major project)

## SERVICE

President

Women in Statistics at CMU

📅 2018 – 2019

📍 Pittsburgh, PA

Co-organizer

Women in Data Science @CMU

📅 2018

📍 Pittsburgh, PA