Cora Allen-Coleman

Statistics PhD Candidate

Statistician with 7 years of theoretical and applied statistics experience and 2 years of software development experience. Currently developing software in Julia for efficient search, estimation & model comparison in complex network space.

Education

2015-09 - present
Ph.D. Statistics University of Wisconsin-Madison
expected May 2020

2008-09 - 2012-05
B.A. Psychology Oberlin College
high honors

Professional Experience

2018-03 - present
Statistics Research Assistant
Professor Cécile Ané, University of Wisconsin–Madison
- Build software in **Julia** for fast estimation of evolutionary networks using an efficient mixture model approach. github.com/crsl4/PhyloNetworks.jl
- Develop and implement a novel network optimization algorithm.

2016-05 - present
Statistics Research Assistant
Professor Ron Gangnon, University of Wisconsin–Madison
- Write an **R** package for clustered rankings using empirical Bayes nonparametric mixture models.
- Deliver flexible weighted ranking & clustering for small area estimates with user-friendly visualizations.

2016-05 - present
Lead Data Analyst
University of Wisconsin-Madison Department of Epidemiology
- Assess breast cancer incidence and survival in a case-control study of over 26,000 women with generalized multivariate additive spatial models, covariate imputation, and variable width smoothing in **R**.

2018-02 - 2019-03
Lead Data Analyst
University of Wisconsin-Madison Department of Medicine
- Explored the effectiveness of a medical science training program using generalized linear mixed effects models.

2012-06 - 2015-08
Epidemiology Research Assistant
Harvard Medical School & Brigham and Women's Hospital
- Assisted in design, analysis, and publication of pharmaceutical postmarketing surveillance studies and clinical trials.
- Led a clinical trial, supervising a team of five research assistants through patient recruitment and data analysis with **R.**
- Managed large-scale healthcare claims data using **SAS**.

Peer-Reviewed Publications

1 Heffron, A., Braun, K.M., **Allen-Coleman, C.**, Filut, A., Hanewall, C., Huttenlocher, A., Handelsman, J., Carnes, M. Gender Can Influence Student Experiences in MD-PhD Training. *Under Review at Journal of Women's Health.*

2 **Allen-Coleman, C.**, Ané, C. Phylogenetic Network Structure Identifiability from Concatenated Genetic Sequences. *In preparation to submit in Spring 2020.*

Personal Info

Location
Madison, WI
(willing to relocate)

Phone
608-239-4068

E-mail
allencoleman@wisc.edu

GitHub
github.com/coraallencoleman

Skills

R

Julia

Python

Bash

Java

Awards

2017-07
National Institutes of Health
Data Science Traineeship

2015-09
National Institutes of Health
Biostatistics Traineeship

2012-03
Leah Freed Memorial Prize for
Honors Thesis Research

2012-01
Jerome Davis Prize for Social Science
Thesis Research

Professional Memberships

American Statistical Association

Caucus for Women in Statistics

3 **Allen-Coleman, C**., Gangnon, R.E. Simultaneous Clustering and Ranking of Small Area Health Outcomes Using Nonparametric Empirical Bayes Mixture Models. *In preparation to submit to Statistics in Medicine in Winter 2019.*

4 **Allen-Coleman, C**, Trentham-Dietz, A, McElroy, JA, Hampton, JA, Newcomb, PA, Gangnon, RE. Geographic Variation in Breast Cancer Risk and Mortality After Adjustment for Established Risk Factors. *In preparation for submission to the American Journal of Epidemiology*.

5 Fischer MA, **Allen-Coleman C,** Farrell SF, Schneeweiss S. Stakeholder assessment of comparative effectiveness research needs for Medicaid populations. *Journal of Comparative Effectiveness Research.* 2015 Sept 21.

6 Bateman BT, Huybrechts KF, Maeda A, Desai RJ, Patorno E, Seely EW, Ecker JL, **Allen-Coleman C**, Mogun H, Hernandez-Diaz S, Fischer MA. Calcium channel blocker exposure in late pregnancy and the risk of neonatal seizures: A cohort study. *Obstetrics and Gynecology*. 2015 Aug; 126(2): 271-8.

7 Bateman BT, Hernandez-Diaz S, Fischer MA, Seely EW, Ecker JL, Franklin JM, Desai RJ, **Allen-Coleman C**, Mogun H, Avorn J, Huybrechts KF. Statins and congenital malformations: a cohort study. *BMJ.* 2015 Mar 17;350:h1035.

8 Polinski JM, Kesselheim AS, Frolkis JP, Wescott P, **Allen-Coleman C,** Fischer MA. A matter of trust: Patient barriers to primary medication adherence. *Health Education Research.* 2014; 29: 755-63.

Teaching and Mentoring Experience

2018-09 - 2018-12

Teaching Assistant for STAT 679: Computational Tools for Data Analytics

- Taught 42 graduate students **Bash** scripting, **Python**, & **Julia**.
- Mentored students individually and in small groups through pair programming and **GitHub** code review.

2016-01 - 2018-05

Undergraduate & Graduate Student Mentoring

- Mentored 6 Statistics undergraduates in preparing honors thesis projects.
- Tutored 7 undergraduate and graduate students in statistics courses weekly.

2015-09 - 2015-12

Teaching Assistant for BMI 511: Introduction to Biostatistics

- Introduced 40 Masters of Public Health students to probability, research design, hypothesis testing, statistical inference, and regression.
- Taught one lecture per week and mentored students independently.

Presentations

Allen-Coleman, C., Gangnon, R.E. Making Ranking Priorities More Explicit. Contributed paper talk at the Joint Statistical Meetings in August 2018

Allen-Coleman, C., Ané, Cécile M. Estimating Evolutionary Rates Efficiently in Phylogenetic Networks. Presented at the Great Lakes Bioinformatics Conference in May 2019

Allen-Coleman, C., Ané, Cécile M. Illuminate Evolutionary History with Phylogenetic Networks. Presented at the Joint Statistical Meetings in August 2019

Allen-Coleman, C., Trentham-Dietz, A., McElroy, J.A., Hampton, J.A., Newcomb, P.A., Gangnon, R.E. Geographic Location and Mortality after Breast Cancer Diagnosis. Presented at the Society for Epidemiologic Research Meeting in June 2018

Coursework

STAT 609 & 709 Advanced Probability (2 semesters)

STAT 849 & 850 Theory and Application of Regression (2 semesters)

STAT 610 Statistical Inference

STAT 710 Mathematical Statistics

STAT 771 Statistical Computing

COMPSCI 302 Programming with Java

COMPSCI 367 Data Structures with Java

STAT 327 Data Analysis with R

STAT 641 Statistical Methods for Clinical Trials

STAT 642 Statistical Methods for Epidemiology

STAT 992 Multilevel Models

STAT 679 Graphical Models

BMI 826 Computational Network Methods

STAT 679 Computational Tools for Data Analytics

STAT 998 Statistical Consulting

BMI 826 Ethics for Data Scientists