Sara K. Venkatraman

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Research interests

Dynamical systems and differential equations, time series analysis, spatiotemporal modeling, numerical analysis, network science

Education

2019 – Present **Cornell University** – Ithaca and New York, NY
PhD in Statistics
Thesis committee: Martin T. Wells, Sumanta Basu, Giles Hooker
Dissertation: *Parameter estimation and inference for nonlinear dynamical systems*

2019 – 2022 **Cornell University** – Ithaca, NY
MS in Statistics

2017 – 2019 **Yale University** – New Haven, CT
MA in Statistics

2013 – 2017 **Cornell University** – Ithaca, NY
BA in Statistics, minor in Computer Science

Awards, grants, and fellowships

2023 William Lewis Brown Scholarship (Cornell Bowers College of CIS)
2023 Cornell Graduate School Conference Travel Grant
2023 Predoctoral Fellowship, Cornell-Hunter Health Equity Research training program
2022 Distinguished Leadership in Service Award (Cornell Bowers College of CIS)
2022 Cornell Center for Pandemic Prevention and Response Seed Funding Grant, co-investigator
2022 Silver Award, Student Paper Competition (Upstate New York Statistics Conference)
2022 Cornell Tech Public Interest Technology Fellowship (link)
2022 International Society for Bayesian Analysis Travel Grant
2021 Student Paper Competition Winner (International Indian Statistical Association; link)
2020 Cornell Bowers College of Computing and Information Science (CIS) Dream Grant
2020 John J. Bartko Scholarship (American Statistical Association)
2016 Outstanding Teaching Assistant in Computer Science (Cornell)

Publications and preprints

* denotes co-first authorship.

2023 **Sparse reconstruction of ordinary differential equations with inference.** Sara Venkatraman, Sumanta Basu, Martin T. Wells. *In submission.*
2nd place in 2022 Upstate New York Statistics Conference student paper competition.

2023 **An empirical Bayes approach to estimating dynamic models of co-regulated gene expression.** Sara Venkatraman, Sumanta Basu, Andrew G. Clark, Sofie Delbare,

Myung Hee Lee, Martin T. Wells. *Data Science in Science.*
IISA Student Paper Competition winner.

2023 **Social isolation and long COVID after acute COVID-19 hospitalization in New York City: a cluster analysis.** Sara Venkatraman, Jesus Maria Gomez Salinero, Adina Scheinfeld, Sean Houghton, David Redmond, Mangala Rajan, Monika M. Safford. *In submission.*

2023 **Revisiting race stratification in the atherosclerotic cardiovascular pooled cohort risk equations.** Arnab K. Ghosh*, Sara Venkatraman*, Michael G. Nanna, Monika M. Safford, Lisandro D. Colantonio, Todd M. Brown, Laura Pinheiro, Eric D. Peterson, Ann Marie Navar, Madeline R. Sterling, Orysya Soroka, Musarrat Nahid, Samprit Banerjee, Parag Goyal. *In submission.*

2023 **Association of telomere length with phenotypic frailty in systemic lupus erythematosus**. Sarah B. Lieber, Robyn A. Lipschultz, Syed S. Zahid, Mangala Rajan, Sara Venkatraman, Myriam Lin, M. Carrington Reid, Neal F. Lue, Lisa A. Mandl. *In submission.*

2022 **Time series transcriptome analysis uncovers regulatory networks and a role for the circadian clock in the *Drosophila melanogaster* female's response to sex peptide.** Sofie Delbare, Sara Venkatraman, Kate Scuderi, Martin T. Wells, Mariana F. Wolfner, Sumanta Basu, Andrew G. Clark. *PNAS*.

2022 **Association between city-wide lockdown and COVID-19 hospitalization rates in multigenerational households in New York City.** Arnab K. Ghosh*, Sara Venkatraman*, Evgeniya Reshetnyak, Mangala Rajan, Anjile An, John K. Chae, Mark A. Unruh, David Abramson, Charles DiMaggio, Nathaniel Hupert. *PLOS ONE*.

2021 **Association between neighborhood overcrowdedness, multigenerational households, and COVID-19 in New York City.** Arnab K. Ghosh*, Sara Venkatraman*, Orysya Soroka, Evgeniya Reshetnyak, Mangala Rajan, Anjile An, John K. Chae, Christopher Gonzalez, Jonathan Prince, Charles DiMaggio, Said Ibrahim, Monika M. Safford, Nathaniel Hupert. *Public Health*.
Coverage: Cornell Statistics, Cornell Chronicle.

Conference and seminar presentations

Inferring chaos and stability in dynamical systems from time series data
November 2023 Cornell Statistics Graduate Society, student seminar

Sparse recovery of dynamical systems and fixed point analysis
August 2023 Joint Statistical Meetings, Uncertainty Quantification in Complex Systems Group
November 2022 Time series research group, Professor David Matteson (Cornell)

Clustering analysis of long COVID hospitalized patients in New York City
September 2023 Weill Cornell Medical College, Department of Medicine Research Retreat

Exploratory data analysis and modeling for public buildings in New York City
March 2023 New York City Open Data Week
December 2022 New York City Department of Design and Construction

Sparse recovery of dynamical systems with inference

September 2023 Cornell Celebration of Statistics and Data Science (poster)
May 2023 SIAM Conference on Applications of Dynamical Systems
May 2023 Graduate Student Research Conference, National Institute of Statistical Sciences
August 2022 Joint Statistical Meetings, Institute of Mathematical Statistics complex systems session
June 2022 World Meeting of the International Society for Bayesian Analysis (poster)
May 2022 Upstate New York Statistics Conference
March 2022 Cornell Statistics Graduate Society, student seminar

A Bayesian approach to estimating dynamic models of gene expression

March 2022 Time series research group, Professor David Matteson (Cornell)
October 2021 Women in Statistics and Data Science Conference, American Statistical Association
August 2021 Joint Statistical Meetings, Section on Bayesian Statistical Science
July 2021 42nd Conference of the International Society for Clinical Biostatistics
June 2021 Women in Network Science at Networks 2021
June 2021 World Meeting of the International Society for Bayesian Analysis
June 2021 Graduate Student Research Conference, National Institute of Statistical Sciences
June 2021 Symposium on Data Science and Statistics, American Statistical Association
May 2021 SIAM Conference on Applications of Dynamical Systems
May 2021 2021 International Indian Statistical Association Conference

The impact of crowded housing on COVID-19 transmission dynamics in NYC

April 2021 Upstate New York Statistics Conference
January 2021 Weill Cornell Medical College, General Internal Medicine Research Seminar

Tutorials

Introduction to creating R packages

November 2022 STSCI 6520 (Statistical Computing I) guest lecture, Cornell

Introduction to spatiotemporal modeling in R

October 2022 New York City Office of Technology and Innovation, Analytics Learning Summit

Introduction to Mathematica for statistics

November 2021 Cornell Statistics Graduate Society, student seminar

Introduction to R

November 2016 Cornell Scientific Software Club

Introduction to LaTeX

September 2015 Women in Computing at Cornell

Teaching experience

Fall 2023 STSCI 6520: Statistical Computing I, Teaching assistant – Cornell
Summer 2023 STSCI 2100: Introductory Statistics, Teaching assistant – Cornell
Fall 2022 STSCI 6520: Statistical Computing I, Teaching assistant – Cornell
Fall 2021 BTRY 6010: Statistical Methods I, Teaching assistant – Cornell
Fall 2019 STSCI 5030: Linear Models with Matrices, Teaching assistant – Cornell

Spring 2019	S&DS 563: Multivariate Statistics, Teaching assistant – Yale
Fall 2018	S&DS 612: Linear Models, Teaching assistant – Yale
Fall 2017	S&DS 105: Introduction to Statistics for Medicine, Teaching assistant – Yale
Spring 2016	STSCI 2150: Statistics for Biology, Teaching assistant – Cornell
Fall 2014 –	CS 1112: Computing with Matlab, Teaching assistant – Cornell
Spring 2017	*Received 2016 departmental award for undergraduate teaching in computer science.*

Industry experience

Summer 2018	**JPMorgan Chase & Co.**, Data Analysis/Engineering Intern – New York, NY Equities trading analytics
Summer 2017	**JPMorgan Chase & Co.**, Software Engineering Intern – New York, NY Equities electronic trading technology
Summer 2016	**JPMorgan Chase & Co.**, Software Engineering Intern – New York, NY Investment management technology
Summer 2015	**Microsoft**, Software Engineering Intern – Redmond, WA Windows operating systems group

Reviewing

2023	**Reviewer**, *Journal of the Royal Statistical Society: Series B*
2022	**Reviewer**, *Data Science in Science*

Service and mentorship

2021 – Present	**Cornell Directed Reading Program**, Co-organizer and mentor Received funding for a reading program that pairs undergraduates with PhD student mentors in the mathematical sciences to undertake semester-long reading projects on topics of mutual interest. Supervised reading projects on population dynamics, ergodic theory, reinforcement learning, and statistical learning theory.
Fall 2021	**Cornell Statistics Graduate Society**, Professional development coordinator Organized a biweekly graduate student research seminar in statistics.
	Joint Statistical Meetings
August 2023	Conference session chair
July 2018	Conference docent (advised first-time JSM attendees on navigating the conference)

Professional memberships

2022 – Present	International Society for Bayesian Analysis
2021 – Present	Society for Industrial and Applied Mathematics
2018 – Present	Institute of Mathematical Statistics
2016 – Present	Caucus for Women in Statistics
2012 – Present	American Statistical Association

Skills

Programming:
Proficient: R, Matlab, Mathematica, Java
Familiar: Python, OCaml, C

Software: LaTeX, Git

Languages: English (native), French (advanced)

Coursework

Statistics: Asymptotic statistics, mathematical statistics, nonparametric statistics, generalized linear models, functional data analysis, high-dimensional statistics, statistical computing, categorical data analysis, optimal transport

Mathematics: Real analysis, measure theory, functional analysis, measure-theoretic probability and martingales, numerical methods for differential equations, numerical linear algebra, perturbation theory

Computer science: Functional programming, systems programming, object-oriented programming and data structures, bioinformatics programming

Other interests

Distance running
Classical piano