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 – 2024	**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

2024	International Society for Bayesian Analysis Travel Grant
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.

2024	**A significance-driven approach to inferring partial differential equations from spatiotemporal data.** Sara Venkatraman, Sumanta Basu, Martin T. Wells. *In preparation.*
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. *JAMA Cardiology*.

2023   **Association of phenotypic frailty and hand grip strength with telomere length 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. *Lupus Science & Medicine*.

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

Inference for sparse recovery of partial differential equations

August 2024	Joint Statistical Meetings, Uncertainty Quantification in Complex Systems Group
July 2024	World Meeting of the International Society of Bayesian Analysis

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 spatiotemporal modeling in R

February 2024   Conference on Statistical Practice, American Statistical Association

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

Introduction to creating R packages and using GitHub

March 2024   Undergraduate research group, Professor Sreyoshi Das, Cornell

October 2023   STSCI 6520 (Statistical Computing I) guest lecture, Cornell

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

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 – Spring 2017	CS 1112: Computing with Matlab, Teaching assistant – Cornell *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: Invited to participate in the workshop "The Blessing of Dimensionality – High Dimensional Geometry, Concentration of Measure" at the University of Connecticut, July 2024.

Other interests

Distance running
Classical piano