

Sakshi Arya

Curriculum Vitae

Case Western Reserve University
Department of Mathematics, Applied Mathematics and Statistics
2145 Adelbert Rd
Cleveland, OH 44106
✉ sakshi.arya@case.edu
🌐 <https://sakshiarya.github.io/>

Research Interests

Multi-armed bandit problem, sequential decision making, nonparametric estimation, statistical learning theory, statistical inverse problems, spatio-temporal analysis

Employment

- July 2023 - Present **Assistant Professor**, *Department of Mathematics, Applied Mathematics and Statistics*, Case Western Reserve University
- Aug 2021- June 2023 **Eberly Postdoctoral fellow**, *Department of Statistics*, Penn State University, with Prof. Bharath Sriperumbudur
- Feb 2021- Aug 2021 **Postdoctoral Associate**, *School of Statistics*, University of Minnesota, with Prof. Snigdhanu Chatterjee
- July 2020- Jan 2021 **Postdoctoral scholar**, *Biological Sciences Division, Department of Public Health Sciences*, University of Chicago

Education

- 2014-2020 **PhD, Statistics**, *The University of Minnesota*, Twin-Cities, MN., Advisor: Prof. Yuhong Yang
- May 2014 **Masters of Science, Mathematics**, *Tata Institute of Fundamental Research, Center for Applicable Mathematics*, Bangalore, Karnataka, India
- May 2012 **Bachelor of Science, Mathematics**, *University of Delhi*, Lady Shri Ram College, India

Publications

- Zack W. Almquist, Sakshi Arya, Li Zeng and Emma S. Spiro. "Unbiased Sampling of Users from (Online) Activity Data." *Field Methods*, 2018
- Sakshi Arya and Yuhong Yang. "Randomized Allocation with Nonparametric Estimation for a Contextual Multi-Armed Banit Problem with Delayed Rewards." *Statistics and Probability letters*, 2020
- Sakshi Arya and Yuhong Yang. "To update or not to update? Delayed Nonparametric Bandits with Randomized Allocation" *Stat*, 2021
- Anuj Abhishek and Sakshi Arya. "Adaptive Estimation of a Function from its Exponential Radon Transform in Presence of Noise" *Sankhya A*, 2023

Lindsey Dietz, Sakshi Arya, Snigdhasu Chatterjee, Auroop Ganguly, Vishal Subedi.
"Predictions of damages from Atlantic tropical cyclones: a hierarchical Bayesian study on extremes" Under revision

Submitted papers

Sakshi Arya, Bharath Sriperumbudur. "Kernelized Epsilon-Greedy Strategy for Contextual Bandits" 2024 +

Sakshi Arya, Yuhong Yang. "Finite-Time Regret Bounds for Contextual Bandits with Delayed Rewards using Randomized Allocation" 2024

Sakshi Arya, Hyebin Song "Semi-Parametric Batched Global Multi-Armed Bandits with Covariates" 2025

Teaching

Case Western Reserve University

Fall 2024 **Instructor**, for STAT 526 (Statistical Learning Theory)

Fall 2024 **Instructor**, for STAT 243 (Mathematical Statistics II)

Spring 2024 **Instructor**, for STAT 244 (Mathematical Statistics II)

Fall 2023 **Instructor**, for STAT 243 (Mathematical Statistics I)

Penn State University

Fall 2021 **Instructor**, for STAT/MATH 414 (Introduction to Probability Theory)

Fall 2022 **Instructor**, for STAT/MATH 414 (Introduction to Probability Theory)

University of Minnesota

Fall 2019 **Teaching assistant**, for STAT 5601 (Nonparametric methods)

Summer 2019 **Teaching assistant**, for qualifying exam training for PhD students

Spring 2019 **Instructor**, for STAT 4101 (Theory of Statistics I)

Fall 2018 **Instructor**, for STAT 3021 (Introduction to Probability and Statistics)

Summer 2017 **Instructor**, for STAT 3011 (Introduction to Statistical Analysis)

- Spring 2018

2014–2015 **Teaching Assistant STAT**

○ 3011: Intro to Statistical Analysis (2)

○ 3022: Data Analysis (1)

○ 5701: Statistical Computing (1)

○ 8052: Design of Experiments (1)

Talks at Conferences

Invited Talks

- "Single-Index Batched Bandits" at the International Indian Statistical Association Conference, Kochi, India, 2024.
- "Single-Index Batched Bandits" at the Joint Meeting of NZMS, AustMS and AMS, Auckland, New Zealand, 2024.
- "Predictions of damages from Atlantic Tropical Cyclones: a Hierarchical Bayesian study on extremes" The International Environmetrics Society Conference (TIES 2024), The University of South Australia, Adelaide, South Australia.
- "Kernelized epsilon-greedy algorithm for nonparametric bandits with covariates" 7th International Conference on Econometrics and Statistics (EcoSta 2024), Beijing Normal University, China.
- "Kernel Epsilon-Greedy Algorithm for Multi-Armed Bandits with Covariates" at CMStatistics, December 2023, Berlin, Germany.
- "Kernel Epsilon-Greedy Algorithm for Contextual Bandits" at the Computing and Uncertainty Analysis Seminar, Case Western Reserve University, November 2023.
- "Epsilon-Greedy Approach for Nonparametric Bandits" at JSM 2023, Toronto, Canada, August 2023.
- "Kernel Epsilon-Greedy Algorithm for Contextual Bandits" at International Indian Statistical Association Annual conference, Colorado School of Mines, June 2023.
- "Kernel Epsilon-Greedy Algorithm for Contextual Bandits" at Stochastic Modeling and Computation Statistics Seminar series, Penn State University, April 2023.
- "Kernel Epsilon-Greedy Algorithm for Contextual Bandits" at the department of statistics, University of Connecticut, October 2022.
- "Bayesian Hierarchical Modeling of Tropical Storms and their Damage Potential: A data driven study" at SIAM student chapter, University of Texas at Arlington, April 2022.
- "Applications of Adaptive Estimation in Nonparametric Regression" at Stochastic Modeling and Computation Statistics Seminar series, Penn State University, October 2021.
- "Adaptive estimation of function from exponential radon transform data" at SIAM Southeastern Atlantic Section Conference, Auburn University, September 2021.
- "Multi-Armed Bandits for Personalized Medicine" at University of St. Thomas, Minneapolis, MN, October 2019.

Contributed talks

- "Kernel Epsilon-Greedy Algorithm for Contextual Bandits" at the 50th anniversary celebration of School of Statistics, University of Minnesota, October 2022.
- "Kernel Epsilon-Greedy Algorithm for Contextual Bandits" at Women in Statistics and Data Science (WSDS), St. Louis, Missouri, October, 2022.
- "Bayesian Hierarchical Modeling of Tropical Storms and their Damage Potential: A data driven study" at a contributed speed session in Joint Statistical Meeting (JSM), Washington DC, 2022.
- "Non-parametric Multi-Armed Bandits with Covariates and Delayed Rewards" at a contributed session in Joint Statistical Meeting (JSM), Denver, CO, 2019.
- "Multi-armed bandits with Covariates and Delayed Rewards" at the 7th International Workshop on Sequential Methodologies, Binghamton, NY, 2019.
- "Treatment Allocation using Multi-Armed Bandits with Covariates" American Statistical Association Twin Cities, Spring Meeting 2018
- "Geo-Social Rankings Derived from Activity based Apps" at workshop on Activity based Networks in SocInfo 2016.

Professional involvement and services

Advising

- Independent Study course: Wentao Lin, Spring 2024.
- Senior Capstone Project: Zachary LeClaire, Spring 2025.
- Senior Research Project: Ruoyu Shao, Spring 2025.
- Senior Capstone Project: Tina Ma, Spring 2025.

Case Western Reserve University

- Undergraduate committee and Appointments committee, MAMS, 2024-25.
- Statistics Undergraduate Sub-Committee, MAMS, 2024-25.
- Datafest organization, 2024.
- Reopening of the Statistics Ph.D. Program, 2024-25.
- Statistics Tenure-Track Faculty Search Committee, 2023-24.
- Member of Statistics Faculty Graduate sub-committee, 2023-24.

Other professional service

- Organized a session on "Statistical Inverse Problems" at the International Indian Statistical Association Conference, Kochi, India, 2024.
- Panelist on "Misogyny in Academia Panel" organized by the Undergraduate Diversity Collective, Case Western Reserve University, 2024.
- Organized a session on "Statistics and its applications to Healthcare, Education and Industry" at the 50th Anniversary Celebration of School of Statistics, University of Minnesota in October 2022.
- Organizing a session on "Statistical Learning Theory" in an upcoming conference, International Indian Statistical Association (IISA) conference in December 2022.
- Session chair for the session "Contemporary Topics in Learning" at Women in Statistics and Data Science (WSDS) conference (Cincinnati 2018)
- Member of American Statistical Association.
- Refereed articles for
 - NeurIPS, ICML
 - Journal of Machine Learning Research (JMLR)
 - The American Statistician
 - Journal of the Indian Statistical Association (JISA)
 - Data Science in Science
 - Sankhya B

Outreach

- (Spring 2025) Presented and interacted with members of Women's STEM Club at Solon High School, Ohio.

University of Minnesota

Awards

- Summer 2019 Martin Statistics Travel Award
- Summer 2018 Graduate Research Partnership Program Fellowship
- Summer 2017 Martin-Buehler Summer Fellowship Award
- Summer 2016 Lynn Lin Fellowship in Statistics

Travel awards

- Fall 2018 Women in Statistics and Data Science Conference, Cincinnati, OH
- Spring 2018 Seminar on Stochastic Processes, Brown University
- Fall 2017 International Indian Statistical Association Conference, Hyderabad, India

Poster

- Machine Learning Summer School (MLSS, July 2019, University College London)
- IRSA conference on "Causal Inference and Data Science" (Spring 2019, University of Minnesota)
- IRSA conference "Cook's Distance and Beyond" (Spring 2019, University of Minnesota)
- IMA workshop on "Statistical and Computational Challenges in Precision Medicine" (Fall 2018, University of Minnesota)
- Seminar on Stochastic Processes (SSP), Brown University (2018, Providence, RI)
- International Indian Statistical Association(IISA) International Conference on Statistics (2017, Hyderabad, India)
- American Statistical Association Twin Cities, Fall Research Conference (2016, Mounds View, MN)

Non-research presentations

- Co-presented (with Haema Nilakanta) on *Shine with Shiny: An introduction to R Shiny* at Business Analytics Symposium, Iowa State University, 2019.
- Co-organized (with Haema Nilakanta) a workshop on R Shiny in UofM Day of Data, 2019.

Others

Summer 2019 Poster award, second place, at Machine Learning Summer School, London

Professional Involvement and Leadership

- Spring 2020 Student representative for faculty search, *School of Statistics*, coordinated student meetings with the candidates and relayed their feedback to the selection committee
- 2018-2019 President, *Association for India's Development Minnesota Chapter (AID Minnesota)*
- 2017-2018 Overall Project Coordinator, *Association for India's Development (AID Minnesota)*
- Spring 2016 - Research Assistant, for Prof. Zack Almquist,
Fall 2016 Project: Activity based networks
- Summer 2016 Statistics Consultant, *Department of Speech-Language-Hearing Sciences, University of Minnesota*, Twin-Cities, MN
- Summer 2015 Statistics in the Community (STATCOM) Consultant, *Compassionate Action for Animals(CAA)*, Investigating Effects of CAA's Veg Fest