

Sakshi Arya

Curriculum Vitae

Case Western Reserve University
Department of Mathematics, Applied Mathematics and Statistics
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🌐 <https://sakshiarya.github.io/>

Research Interests

Multi-armed bandit problem, sequential decision making, nonparametric estimation, statistical learning theory, 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 and Prof. Murali Haran
- 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*, 2022

Submitted papers

Lindsey Dietz, Sakshi Arya, Snigdhanu Chatterjee. "Predictions of damages from Atlantic tropical cyclones: a hierarchical Bayesian study on extremes" Revise and Resubmit.

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

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

Working papers

Lindsey Dietz, Sakshi Arya, Snigdhanu Chatterjee. "Extreme-value based modeling of Maximum Windspeed and Minimum Central Pressure in Tropical Cyclones" Preparing for submission

Sakshi Arya, Hyebin Song "Single-Index Contextual Bandits" In preparation.

Awards

Awarded by University of Minnesota

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

Others

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

Teaching

Case Western Reserve University

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

- "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.

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.

Experience

- 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
- Summer 2011 Volunteer for Jan Jagran Shakti Sangathan(JJSS), *Conducting social audits and surveys in the village Panchayats*, Bihar, India

Professional involvement and services

- DataFest co-organizer 2024 and 2025.
- Statistics Tenure-Track Faculty Search Committee, 2023-24.
- Member of Statistics Faculty Graduate sub-committee.
- 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
 - The American Statistician
 - Journal of the Indian Statistical Association (JISA)
 - NeurIPS
 - ICML
 - Data Science in Science

Outreach

Spring 2025 Presented and interacted with high school students about career in Mathematics and Statistics at the Women's STEM club at Solon High School, *Ohio*

[University of Minnesota](#)

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)*

[Lady Shri Ram College](#)

Spring 2012 Editor, *Eclat - A Mathematical Journal*

2011-2012 President, *Hostel*, Lady Shri Ram College, Delhi, India