

Sakshi Arya

Curriculum Vitae

Case Western Reserve University
Department of Mathematics, Applied Mathematics and Statistics
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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" Submitted.

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

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

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**.
 - o 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 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 Statistal 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

- 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)

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.