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, 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. Snigdhansu 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, Snigdhansu 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 - Spring 2018	**Instructor**, for STAT 3011 (Introduction to Statistical Analysis)
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, Decemeber 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 20205.
- ○ Senior Research Project: Ruoyu Shao, Spring 2025.
- ○ Senior Capstone Project: Tina Ma, Spring 2025.

Case Western Reserve University

- ○ Undergraduate 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)

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, Cincinatti, 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 Statististal Association(IISA) Iinternational 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 - Fall 2016   Research Assistant, for Prof. Zack Almquist, 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