**Office Contact Information**
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# Curriculum Vitae

Aranyak Acharyya

## Employment

**Johns Hopkins University** **2024 -2025**
*Postdoctoral Fellow (on-going) in Mathematical Institute for Data Science* *Baltimore, USA*

## Education

**Johns Hopkins University** **2019 -2024**
*Ph.D. in Applied Mathematics and Statistics* *Baltimore, USA*

**Johns Hopkins University** **2023**
*Master of Science in Engineering in Applied Mathematics and Statistics* *Baltimore, USA*

**Indian Institute of Technology Kanpur** **2017 – 2019**
*Master of Science in Statistics* *Kanpur, India*

**Presidency University** **2014 – 2017**
*Bachelor of Science in Statistics* *Kolkata, India*

## Research interests

- **Artificial intelligence**: Study of generative models, including but not restricted to large language models, by statistical analysis of their embeddings in finite-dimensional Euclidean space, establishing concentration bounds and asymptotic convergence guarantees
- **Statistical inference on networks**: Developing methods with desirable large sample guarantees for inference on network data, with applications in neuroscience, social science, and biology
- **High dimensional Statistics**: Extracting information from high dimensional data by leveraging underlying low dimensional manifold structure
- **Nonparametric Statistics**: Analyzing the redundancy of the features in a nonparametric regression setting to help develop a parsimonious model
- **Measurement error models**: Suggesting finite-sample adjustments for statistical inference procedures on network data with asymptotically vanishing noise

## Publications and preprints

- "Embedding-based statistical inference on generative models", Hayden Helm, Aranyak Acharyya, Brandon Duderstadt, Youngser Park, Carey Priebe, *arXiv preprint, arXiv:2410.01106.* (2024)
- "Consistent estimation of generative model representations in the data kernel perspective space", Aranyak Acharyya, Michael W. Trosset, Carey E. Priebe, Hayden S. Helm, *arXiv preprint, arXiv:2409.17308.* (2024)
- "Consistent response prediction for multilayer networks on unknown manifolds", Aranyak Acharyya, Jesús Arroyo Relión, Michael Clayton, Marta Zlatic, Youngser Park, Carey E. Priebe, *arXiv preprint, arXiv:2405.03225.* (2024)
- "Semisupervised regression in latent structure networks on unknown manifolds", Aranyak Acharyya, Joshua Agterberg, Michael W. Trosset, Youngser Park, Carey E. Priebe, *Applied Network Science* 75 (8), November 2023. doi: 10.1007/s41109-023-00598-9. (2023)
- "Variable Selection in Multiple Nonparametric Regression Modelling", Subhra Sankar Dhar, Shalabh, P. Jha, Aranyak Acharyya, *Advanced Mathematical Techniques in Computational and Intelligent Systems*, ISBN 9781032398662. (2023)
- "Random walk with nonuniform angular distribution biased by an external periodic pulse", Aranyak Acharyya, *European Journal of Physics 37 (2016) 065104.* (2016)

## Talks

- *28th August 2024*: "Response prediction with convergence guarantees in multiple random graphs on unknown manifolds", 26th International Conference on Computational Statistics, University of Giessen, Germany [virtual]
- *5th March 2024*: "Convergence guarantees for response prediction in latent structure networks on unknown one-dimensional manifolds", Student Seminar, Department of Applied Mathematics and Statistics, Johns Hopkins University
- *4th March 2024*: "Convergence guarantees for response prediction in latent structure networks on unknown one-dimensional manifolds", Research Interaction Team, University of Maryland at College Park
- *17th December 2023*: "Convergence guarantees for response prediction in latent structure networks on unknown one-dimensional manifolds", International Conference of the ERCIM WG on Computational and Methodological Statistics, HTW Berlin, University of Applied Sciences, Berlin, Germany (invited talk)
- *18th April 2023*: "Measurement Error correction in RDPG on manifolds", Student seminar, Department of Applied Mathematics and Statistics, Johns Hopkins University
- *9th November 2021*: "On convergence guarantees of regression parameter estimates for Random Dot Product Graphs (RDPGs) with latent positions on 1-dimensional manifold in a high dimensional ambient space", Student seminar, Department of Applied Mathematics and Statistics, Johns Hopkins University
- *13th April 2021*: "Improving performance of regression parameter estimator on random dot product graph using Fuller's measurement error adjustment", Student seminar, Department of Applied Mathematics and Statistics, Johns Hopkins University

## Teaching Experience

- **High Dimensional Approximation, Probability and Statistical Learning (EN.553.738)**, Teaching Assistant, Spring 2024, Johns Hopkins University
- **Applied Statistics and Data Analysis (EN.553.613)**, Teaching Assistant, Fall 2023, Johns Hopkins University

- **Shape and Differential Geometry (EN.553.780)**, Teaching Assistant, Fall 2022, Johns Hopkins University
- **Statistical Pattern Recognition Theory and Methods (EN.553.739)**, Teaching Assistant, Spring 2022, Johns Hopkins University
- **Statistical Theory(EN.553.730)**, Teaching Assistant, Fall 2021, Johns Hopkins University
- **Statistical Theory(EN.553.730)**, Teaching Assistant, Fall 2020, Johns Hopkins University
- **Introduction to Data Science (EN.553.436)**, Teaching Assistant, Spring 2020, Johns Hopkins University
- **Introduction to Statistics (EN.553.430)**, Teaching Assistant, Spring 2020, Johns Hopkins University
- **Discrete Mathematics (EN.553.171)**, Teaching Assistant, Fall 2019, Johns Hopkins University
- **Introduction to Statistics (EN.553.430)**, Teaching Assistant, Fall 2019, Johns Hopkins University

## Miscellaneous Experience

### Awards

- **MINDS Fellowship**, Johns Hopkins University (2022)
- **Edwin D. and Rachel Lowthian Endowed Fellowship**, Whiting School of Engineering, Johns Hopkins University (2019-2020)
- **INSPIRE Scholarship**, Department of Science and Technology, Government of India (2014-2019)

### Certification

- **Certificate for Merit of Academic Excellence**, Department of Mathematics and Statistics, Indian Institute of Technology Kanpur (2017)

## Technical Skills

**Coding**: C, R, Python

**Word processing**: LATEX

## Other

**Languages**: English (proficient), Hindi (fluent), Bengali (native)