

# DAKSHESH VASAN

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Dept. of Statistics and Probability, Michigan State University

## RESEARCH INTERESTS

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Primary: Optimal Transport | Currently working on Convergence of empirical measure to true measure in Wasserstein and related Distances

Secondary: Analysis of Stochastic Processes, Extreme Value Theory, Mathematics in Democracy

Other: Intelligence Analysis, Geopolitics and History

## EDUCATION

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**(Ongoing) Doctorate of Philosophy**, Statistics Aug 2023 - May 2028

[Michigan State University \(MSU\)](#) | Advisor: [Prof. March Boedihardjo](#), Dept. of Mathematics

Co-Advisor: [Prof. Yimin Xiao](#), Dept. of Statistics & Probability at MSU

**Research Topic: Wasserstein and other related distances.**

Completed Coursework: High Dimensional Probability, Optimal Transport, Weak Convergence in Empirical Processes, Gaussian Random Fields, Functional Data Analysis, Generative AI, Statistical Inference, Linear Mixed Model Theory

**Master of Science (MS)**, Mathematical Sciences Aug 2022 - Jul 2023

[Indian Institute of Science Education and Research \(IISER\)](#), Kolkata

**Concentration: Statistics and Probability** | Relevant Coursework: Time Series Analysis, Multivariate Analysis, Differential Geometry, PDE

**MS Project: Probabilistic Analysis of Stochastic Processes** — Grade: A+

**Independent Study: Extreme Value Theory** — Grade : A+ | **GPA:** 9.10/10

**Bachelor of Science (BS)**, Mathematical Sciences Aug 2018 - Jul 2022

[Indian Institute of Science Education and Research \(IISER\)](#), Kolkata

Relevant Coursework: Measure Theory, Functional Analysis, Geometry of Curves and Surfaces, Probability Theory, Stochastic Processes, Graph Theory, Statistical Inference, Linear Models | **GPA:** 8.71/10

## RESEARCH EXPERIENCE

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**Subspace Robust Wasserstein Distances** Fall 2025-?

**Advisor:** [Prof. March Boedihardjo](#); Dept of Mathematics, *MSU*

Currently investigating behavior of subspace robust Wasserstein distance.

**Paper Reading on Random Fields** Fall 2024

**Advisor:** [Prof. Yimin Xiao](#); Dept of Statistics and Probability, *MSU*

Studied the paper titled 'Stationary Max-Stable Fields Associated to Negative Definite Functions' by Zakhar Kabluchko, Martin Schlather and Laurens de Haan; and [presented](#) it.

**Probabilistic Analysis of Stochastic Processes | MS Project** Aug 2022 - May 2023

**Advisor:** [Dr. Anirvan Chakraborty](#); Asst. Professor, Dept. of Mathematics and Statistics *IISER Kolkata*

- Studied Robert J. Adler's Monograph titled, '[An Introduction to Continuity, Extrema, and Related Topics for General Gaussian Processes](#)' (1990). Links: [MS Report](#) | [Autumn semester-report](#) | [Spring semester-report](#).
- Studied the Development of entropy arguments as sufficient conditions for sample path continuity of general Gaussian processes defined on totally bounded parameter spaces, Comparison Inequalities, and relationship between suprema distributions and continuity.

**Extreme Value Theory | Independent Study** Jan 2023 - May 2023

Supervisor: [Dr. Anirvan Chakraborty](#); Asst. Professor, Dept. of Mathematics and Statistics *IISER Kolkata*

- Studied and solved exercises from Chapters 1-5 of 'Extreme Value Theory: An Introduction' (Laurens de Haan, Ana Ferreira) covering the Fischer-Tippett-Gnedenko result, other results, and estimators.

## Analysis of Voting Rules

Mentor: [Prof. Samuel Wang](#); Director, [Electoral Innovation Lab](#); Prof. of Neuroscience

Sep 2022 - Dec 2022  
*Princeton University, NJ*

- Compared different voting rules through Python/MATLAB simulations based on real cast-vote records. Investigated the efficiencies of different voting roles in resisting strategic manipulation of the IRV voting rule to favour the win of a non-Condorcet candidate.

## ACADEMIC PROJECTS

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### [Simultaneous Confidence Corridors in medical imaging data](#)

Spring 2025

Implemented and studied a Functional Data Analysis (FDA) research paper by Wang, Wang, Wang and Ogden.

### **Generative AI - Understanding Deep Neural Networks**

Spring 2025

[Studied](#) a research paper by Zeger et al.

### [Temperature Time Series Analysis](#)

Autumn 2022

Exploratory time series analysis of temperature data from weather station 42809(WMO ID), Kolkata. Implemented an appropriate ARMA model and compared it's prediction with that obtained from another multivariate VARMA model implemented for data from 2 weather stations and Kolkata together.

### **Presented a [Talk on 'Support Vector Machine'](#)**

Autumn 2022

Studied and presented the motivation behind SVM, it's mathematical basis, visualizations and extensions of SVM to non linearly separable cases.

### **A brief study of different ML Techniques**

Spring 2022

Implemented Random Forest, XGBOOST, and Multi Layer Perceptron algorithms on two different datasets, and analysed the classification networks from all the three algorithms to compare the classification accuracy. Tried an original ensemble and analysed it's accuracy.

## WORK EXPERIENCE

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### **Graduate Teaching Asst., Dept of Statistics and Probability, Michigan State University**

Fall 2023-now

Courses Assisted: [STT200: Introduction to Statistics](#) Fall 2023, Spring 2024, Fall 2024

[STT231: Statistics for Scientists](#) Spring 2025 | [STT315: Introduction to Probability and Statistics for Business](#) Fall 2025

Courses Instructed: [STT200: Introduction to Statistics](#) Summer 2024, Summer 2025 (Online)

### **Teaching Assistant, Dept of Mathematics and Statistics, IISER Kolkata**

Autumn 2021-Spring 2023

Courses Assisted: [MA2202: Probability I](#) Spring 2023 | [MA1101: Mathematics I](#) Autumn 2022 | [MA2103: Mathematical Methods I](#)

### **Market Research and Analysis Summer Intern**

Summer 2021

Interned at [Market-i](#), a freezone company in Dubai that offers market research and consultancy services. Conducted different real-time client-specific customer surveys, processed data, prepared summary reports with client-specific advice based on inferences made.

## SCHOLARSHIPS AND FELLOWSHIPS

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- Awarded 5-year guaranteed graduate assistantship at Dept. of Statistics and Probability, Michigan State University.
- [KVPY Fellowship 2019-23](#), awarded by IISc Bangalore and Dept. of Science and Technology, Government of India upon securing an All India Rank 94 in the Screening Process.
- [DST-INSPIRE Scholarship for Higher Education](#) 2018-23, awarded to students who are in the top 1% of all students clearing school-leaving examinations. [Declined after 2018-19 to receive KVPY Fellowship]

## TALKS, PRESENTATIONS AND CONFERENCES

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- Delivered a talk on Extreme Value Theory: An Introduction to the Fisher-Tippett-Gnedenko Theorem at the STT Student Seminar, Fall 2024  
11 Oct 2024
- Delivered a [talk](#) titled, "Probabilistic Analysis of Stochastic Processes" as part of the Graduate Student Seminar Thesis Talk 2023, DMS, IISER Kolkata  
12 May 2023

- Delivered a talk titled: "The Little Hero of Haarlem (A peek at Extreme Value Theory and its Applications)" in the DMS Symposium 2023, IISER Kolkata.
- Attended the [NYU Math and Democracy Seminar](#) on 'Ranked Choice Voting and the Spoiler Effect', by Jennifer Wilson, The New School; and David McCune, William Jewell College. Nov 2022
- Delivered a talk on Basic Statistical Analysis for Research Purposes, directed at Master Students at Loyola College, Chennai Sep 2022
- Delivered a talk on some Statistical Tools and Python Resources, directed at senior school students at AAIS, Chennai Jul 2022
- Invited to the [National Science Camp \(VIJYOSHI\)](#), held at IISER Kolkata Dec 2019
- Invited to the [National Science Camp \(VIJYOSHI\)](#), held at IISER Bhopal Dec 2018

## SKILLS

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<b>Technical Skills</b>	Python, MATLAB, GNUPlot, BrandMap
<b>Certification</b>	by MAX Security in Intelligence Analysis: Scored 100% on test of skills including Brief/Summary/Detailed Intelligence Product development, satellite image analysis, pattern recognition & trend analysis, collection of sources and identification of anomalies.
<b>Languages Known</b>	English (Medium of Instruction, TOEFL iBT 113/120), Tamil, Hindi, French (Second language), Arabic (Third Language), Sanskrit

## LEADERSHIP

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- Committee of the Whole Student Representative, Dept. of Statistics and Probability, MSU 2025-26
- Student Rep. for Statistics and Probability in the MSU College of Natural Science Student Advisory Council 2025-26
- Fest Coordinator, [Inquivesta X](#) - The tenth edition of IISER Kolkata's annual science festival. Supervised the organisation and management of a three day festival filled with scientific outreach events packaged in a fun and attractive manner for school students, children, and college-goers. Jan 2023 - Apr 2023
- Student Representative to the UG Academic Committee and Academic Senate of IISER Kolkata Autumn 2022
- (Acting) Academic General Secretary (BS-MS), [Student Council](#) Dec 2021 - Aug 2022
- Cultural General Secretary (BS-MS), [Student Council](#) Sep 2020 - Aug 2022
- Advisor, [Identity](#)-The Math Club of IISER Kolkata Sep 2021 - Dec 2021
- Founder, Fest Coordinator of [Revival](#), an online cultural fest Mar 2021
- Sponsorship Executive, [Inquivesta](#) - IISER Kolkata's annual student festival Aug 2019 - Aug 2020

## OUTREACH

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- [Inquivesta 2023](#): Organized and Managed STEM-based fun outreach events aimed at school and college-goers to promote scientific temperament. Jan 2023 - Apr 2023
- Scientific Communication : Publicity and Outreach Manager, [Cogito137](#) Mar 2020 - Feb 2021
- Volunteer at the [Ek Pehal](#) - IISER Kolkata's student run community initiative to expose underprivileged children to science, and provide supplementary education free of cost Oct 2018 - May 2023

## EXTRA-CURRICULAR

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- Active Rower since Fall 2025 in the MSU Crew Club, participated in intercollegiate regattas around the United States. Won the B Finals of American Collegiate Rowing Association 2025
- Wrote an extensive [report on 'India's Deceptive Nuclear Program'](#) for a course on 'Critical Thinking in Law Enforcement Agencies' conducted by Prof. Michael Rip, School of Criminal Justice, Michigan State University.

- Qualified Pravesha and Parichaya Sanskrit Language Exams conducted by Samskrta Bharati with Distinction.
- Won GOLD for IISER Kolkata in the Debate event at the annual Inter IISER Cultural Meet 2022, IISER Pune.  
Represented IISER Kolkata in the 400m Athletic Event at the annual Inter IISER Sports Meet 2019, IISER Pune.

## REFERENCES

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- Academic Referees:
  - 1.PhD Advisors: Prof. March Boedihardjo, boedihar@msu.edu | Prof. Yimin Xiao, xiaoy@msu.edu
  - 2.MS Project Supervisor: Dr. Anirvan Chakraborty, anirvan.c@iiserkol.ac.in
  - 3.Undergraduate Course Instructor & Mentor: Dr. Satyaki Mazumder, satyaki@iiserkol.ac.in
- Professional Referees:
  - 4.Current Assistantship Supervisors: Camille Fairbourne, fairbour@msu.edu | Dr. Elijah Dikong, dikonge@msu.edu
  - 5.Previous Assistantship Supervisors: Dr. Soumya Bhattacharya, soumya.bhattacharya@iiserkol.ac.in | Dr. Saugata Bandyopadhyay, saugata.bandyopadhyay@iiserkol.ac.in
  - 6.Former Director of IISER Kolkata: Prof. Sourav Pal, sourav@ashoka.edu.in