Koustav Chowdhury

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Introduction

I am a first-year Masters student of Statistics (**M.Stat**) at the Indian Statistical Institute, Kolkata. I have also completed my Bachelor of Statistics (**B.Stat**) at the Indian Statistical Institute, Kolkata. I am also a **KVPY Fellow**. My research interests include Machine Learning, Statistical Learning Theory, Optimization Theory, Clustering and applications in these fields that address practical challenges. I thrive in inter-disciplinary environments. I am proficient in R, C, Python, LaTeX, MATLAB, MS Office, and G-Suite.

Education

2025-Ongoing **Master of Statistics**, *Indian Statistical Institute*, Kolkata, India
Aggregate Percentage (till now): 95.8%

2022–2025 **Bachelor of Statistics (Hons.)**, *Indian Statistical Institute*, Kolkata, India
Aggregate Percentage: 92.74%

2021–2022 **Higher Secondary Education**, *Jenkins School*, Cooch Behar, India
Percentage: 96.4%

Till 2020 **Primary Education**, *St. Mary's High School*, Cooch Behar, India
Class X Marks: 94%

Published (or accepted) papers/articles

2025 **Convex Clustering Redefined: Robust Learning with the Median of Means Estimator**, **K. Chowdhury***, *S. De*, B. Mandal*, S. Ghosh, S. Das, D. Paul, & S. Chakraborty*
Accepted for publication in the **The 40th Annual AAAI Conference on Artificial Intelligence**
URL : **https://arxiv.org/abs/2511.14784**

Ongoing Research Projects

August, 2025 **Studying Endogeneity in High Dimensional Linear Mixed-Effects Models**, *Indian Statistical Institute*, Kolkata, India
Supervisor: Prof. Abhik Ghosh
Studying various robust minimum-distance estimation approaches in Linear Mixed-Effects Models (LMM) for the high dimensional setting.

June, 2025 **Connecting Multi-Arm Bandits with Stochastic Mirror Descent**, *Indian Statistical Institute*, Kolkata, India
Supervisor: Prof. Koulik Khamaru
Studying the Multi-Arm Bandits problem using Stochastic Mirror Descent (SMD). Providing theoretical guarantees such as proof of convergence and Non-Asymptotic rate of convergence.

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*Equal contribution.

Completed Research Projects

July, 2025 — **Studying genetic overlap of Coronary Artery Disease and Major Depressive Disorder using GWAS summary statistics**, *YSPH, Yale University*, CT, USA
Supervisor: Prof. Hongyu Zhao
Analyzed large-scale GWAS data (CAD and MDD) to assess shared genetic architecture. Estimated SNP heritability and genetic correlation via LDSC, and identified several novel pleiotropic loci using PLACO and Meta Analysis, supporting partial genetic overlap between CAD and MDD.
[**PPT**]/[**Poster**]

May, 2025 — **Temporal Sentiment Analysis – A Statistical Exploration of Societal Distress and Reaction**, *Indian Statistical Institute*, Kolkata, India
Supervisor: Prof. Kiranmoy Das and Prof. Anil K. Ghosh
Modelling momentary anger across time caused due to incidents that triggered an immediate and widespread emotional response throughout the city. Explaining variations in various behavioral responses for various sections of society. Modelling was done using GEE equations and Quasi-Likelihood optimization. Data was collected through surveys across households all over Kolkata, India.
[**PPT**]/[**Report**]

May, 2025 — **Time Series Analysis of Sector-wise GDP in India using MOSPI Data**, *Indian Statistical Institute*, Kolkata, India
Supervisor: Prof. Kiranmoy Das and Prof. Anil K. Ghosh
A comprehensive time series analysis on various sectors of GDP such as Agriculture, Fishing, etc. The analysis includes, using Jump Regression for trend estimation, SARIMA Model fitting and forecasting.
[**PPT**]/[**Report**]

May, 2025 — **Studying the Structure of the Local Neighborhood of a Randomly Selected Vertex of a Large but Sparse Erdős-Rényi Binomial Random Graph**, *Indian Statistical Institute*, Kolkata, India
Supervisor: Prof. Antar Bandyopadhyay
Statistically studying the local (d-depth) neighborhood of a randomly selected vertex of a large but sparse Erdős-Rényi random graph through simulations and theory available in the field.
[**PPT**]/[**Report**]

November, 2024 — **Demographic Analysis and Comparative Study of Maharashtra and Manipur using NFHS-5 dataset**, *Indian Statistical Institute*, Kolkata, India
Supervisor: Prof. Kajori Banerjee
A study aimed to provide insights into the disparities and developments that shape Maharashtra and Manipur, the socio-economic dynamics, health indicators, and lifestyle patterns that define the populations of these two diverse regions offering an understanding of India's multifaceted socio-economic landscape. Key metrics will include income and expenditure, education levels, and reproductive health.
[**PPT**]/[**Report**]

March, 2023 — **Reconstructing Signals from Noisy Data**, *Indian Statistical Institute*, Kolkata, India
Supervisor: Prof. Probal Chaudhuri
Utilizing moving average estimators for denoising noisy signals to reconstruct the original signal.
[**Report**]

February, 2023 — **Exploratory Data Analysis of Concrete Strength**, *Indian Statistical Institute*, Kolkata, India
Supervisor: Prof. Kiranmoy Das
Fitted a multivariate regression model, analyzed important/redundant variables, and optimized feature sets.
[**Report**]

Internships and Experiences

Summer 2025 — **Big Data Summer Immersion at Yale (BDSY)**, Yale School of Public Health, Yale University, CT, USA.

Attended a 6-week NIH funded SIBS-program which included classes on Statistical Genetics, Causal Inference and Public Health Modelling Problems. Attended expository and journey lectures of great researchers. Attended Research Groups and conducted collaborative research and presentations under Prof. Hongyu Zhao.

Summer 2025 — Invited for Nurture Camp at IIT Bhubaneswar for qualifying Madhava State Level 2025.

Spring 2025	Attended **Winter School of Deep Learning** at Indian Statistical Institute, Kolkata
Winter 2024	Data Analyst at Innover Capital Solutions Pvt Ltd.
Winter 2021	Attended **VIJYOSHI Camp** organized by IISc Bangalore.

Awards and Invited Talks

October, 2025	**[Invited talk] D. Basu Memorial Award Presentation at the ISI, Kolkata** **Title** : Exploring Bandit Algorithms: A useful tool to deal with Sequential Data [**Slides**]

Achievements and Scholarships

2025	Madhava Contest State-Level Qualification and invitation for Nurture Camp
2023	Madhava Contest State-Level Qualification
2022	JEE Mains: 99.967 percentile (AIR: 369)
2022	JEE Advanced: AIR 808
2022	WBJEE: Rank 5
2022	ISI Entrance Test: Rank 17 with scholarship
2021–2022	KVPY Fellowship (SA AIR: 443; SX AIR: 437)
2021	Qualified NTSE Stage-I (Rank: 43) and JBNSTS with scholarship
Various	Prize money awarded for commendable marks in 1st, 3rd, and 4th semesters

Technical Skills

Programming	R, C, Python, MATLAB
Document Preparation	LaTeX, MS-Office, G-Suite
Mathematical Techniques	Statistical Modeling, Optimization, Graph Theory

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The information provided is correct to the best of my knowledge.