AKANKSHA DAS ISI, KOLKATA

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https://github.com/Kuroshio2023

EDUCATION

Theoritical Statistics and Mathematics Unit, Indian Statistical Institute Kolkata

Bachelor of Statistics 3rd year 2023 - present

- **Core Areas of Study:** Statistical Inference, Probability, Linear Algebra, Stochastic Process, Differential Equations, Design of Algorithms, Parametric Inference
- **Electives:** Topology and Complex Analysis, Molecular Biology
- **Grade** 74.25/100
- Received Honours with Distinction

Techno India Group Public School Hooghly

Pre-College: 11th and 12th Standard 2021-2023

- **Area of Study :** Mathematics, Physics, Chemistry, Computer Science and English
- **Grade** 92.4/100
- Received Honours with Distinction

RESEARCH INTERNSHIPS

Centre For Artificial Intelligence And Machine Learning | Dr. Malay Bhattacharyya

- **Clustering Data with Missing Information**: We have reformulated the problem of clustering data with missing information as clustering probability distributions, where each data point is represented as a probability distribution rather than a fixed vector **https://github.com/Kuroshio2023/Gaussian-Distance**

Complex Network Research Group | Dr. Niloy Ganguly

- **Latent Surface Attribution**: Feature attribution methods assign importance score to input features to explain predictions. Inspired by string theory's Nambu-Goto Action, I created Latent Surface Attribution, a baseline-free surface attribution technique framework replacing 1D paths with 2D surfaces in latent space. It outperformed Manifold Integrated Gradients (SOTA) by 24.07 percentage AUC-ROC on ImageNet. Currently we are collaborating with CNeRG engineers who are testing the method in Reward assignment in Reinforcement Learning **https://github.com/Kuroshio2023/Latent_Surface_Attribution**
- **Attribution Techniques in the context of Information Theory**: We are trying to develop a set of axioms for Attribution Techniques inspired by properties of mutual information and propose an alternative to the additive nature of attribution. **https://github.com/Kuroshio2023/Information_Theoretic_Attribution**

Center for Data Science | Dr. Bruno Loureiro

- **Mode Collapse on Variational Inference**: We are theoretically studying the phenomenon of mode collapse from an optimal transport perspective and mitigation strategies that promote mode seeking behavior **https://github.com/Kuroshio2023/Mode_Collapse**

CLASS PROJECTS

Does the RSM Effect extend Beyond ISI Entrance?

Conducted a retrospective statistical analysis on the 2023-26 B.Stat batch to evaluate the impact of a very well known and successful coaching on ISI entrance exam success and first-year academic performance. 2025

Factors Affecting Domestic Violence on Women

I worked with National Family Health Survey to study the factors affecting Domestic Violence on Women and its correlation with female empowerment, alcohol abuse, age at the time of marriage and poverty and its variance among the different states of India 2024

Online Linearized LASSO

Studied LASSO regression and its limitations and implemented Online Linearized LASSO from scratch in Python 2023

SUMMER SCHOOLS

Summer School for Women in Mathematics and Statistics

Summer School for women in STEM organised by Dr. Shiva Athreya in International Centre for Theoretical Sciences, Bangalore (ICTS). 2024

Cornell Summer School in Probability

A course on Spin glasses by Dr. Antonio Auffinger held at Cornell University in July 2024

AWARDS AND HONORS

- **KVPY SA Fellowship** awarded for outstanding performance in science to motivate high-school students to pursue research in STEM fields. 2021
- **Inspire Fellowship**, awarded for outstanding performance in science to avail expenses for college and summer internships 2024
- **CMI Merit Scholarship**, awarded for exceptional performance in Chennai Mathematical Institute Entrance Examination 2023
- **ISI Academic Scholarship**, awarded for exceptional performance in the Indian Statistical Institute Entrance Examination 2023
- **IISC BS Programme**, invited to join the prestigious IISC BS programme for outstanding performance in the KVPY examination 2023

SKILLS

Languages: English, Hindi, Bengali.

Programming Languages: `Python`, `JAVA`, `R`, `SQL`.

GPU Programming and Linux based Systems: Experience with implementing parallel programming algorithms for leveraging NVIDIA CUDA in data-intensive tasks requiring high computational complexity.

EXTRA-CURRICULAR ACTIVITIES

Machine Learning For All: Founded the club with fellow classmate Himadri Mondal to create a support group for undergraduates who wish to explore ML as a possible career choice. We discuss new research, implement research papers, participate in datathons, share cool internship opportunities with our members.

Statistics Reading Group: Events include past alumni of ISI presenting recent publications every week with follow up discussion sessions along with short summer and winter courses.

Teaching: I train high school and middle school students for math olympiads, extrance examinations for Indian Statistical Institute, Chennai Mathematical Institute and other competitive exams like KVPY.

Mathematics Talent Reward Programme: I am part of the organising committee of MTRP that conducts an exam every year on the basis of which 30 talented middle and high school students are selected for a 2 day mathematics camp in ISI.

Lab Assistant: for the course Data Analytics in Python, Summer 2024 offered by CAIML, ISI.

REFERENCES

Dr. Malay Bhattacharyya Associate Professor, Coordinator, Centre for Artificial Intelligence and Machine Learning, Indian Statistical Institute, Kolkata, India.
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Dr. Niloy Ganguly, Professor, Indian Institute of Technology, Kharagpur
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