

SOMJIT ROY

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EDUCATION




Texas A&M University , College Station, Texas, USA	2023 — present
Doctor of Philosophy (Ph.D.) in Statistics	GPA: 4.00/4.00
Advised by Bani K. Mallick (TAMU Statistics) and Debdeep Pati (UW Madison Statistics).	
University of Calcutta , Kolkata, West Bengal, India	2021 — 2023
Master of Science (MSc.) in Statistics (<i>Ranked First Class First</i>)	GPA: 8.15/10.00
St. Xavier's College , Kolkata, West Bengal, India	2018 — 2021
Bachelor of Science (BSc.) in Statistics (Hons.)	GPA: 8.63/10.00

EXPERIENCE

Los Alamos National Laboratory	May 2025 — Aug 2025
Graduate Summer Intern	Los Alamos, NM, USA
<ul style="list-style-type: none">• SPINWAVEDD: Scalable Physics-Informed Neural Operator for Seismic WAVE Modeling using Domain Decomposition.• Advised by Kai Gao & Ting Chen in <i>Earth and Environmental Sciences</i> (EES-16) division. Developing scalable framework for seismic wave modeling using Physics-Informed Neural Operators (PINO).	
Tata Electronics Pvt. Ltd.	May 2021 — Aug 2021
Data Science Intern	Bengaluru, KA, India
<ul style="list-style-type: none">• Statistical Analysis and Optimization of Sandblasting & Anodizing.• Supervised by Nagasubramanian Kothandaraman (Tata Electronics Pvt. Ltd.) & Subhamoy Maitra (ISI, Kolkata). Identified key features affecting material properties (gloss and texture) and optimized process parameters using local minimization, machine learning models, and variability analysis. Successfully reduced costs by 2 mandays.	





PAST RESEARCH POSITIONS & PROJECTS

University of Maryland , College Park	Sep 2022 — May 2023
Research Fellow	College Park, MD, USA
<ul style="list-style-type: none">• Addressing Nonresponse in Surveys through Imputation & An Application to Social Sciences.• Supervised by Partha Lahiri in <i>Department of Mathematics</i>. This work resulted into my master's dissertation. Nonresponses in primary household survey data were augmented by a general class of imputation technique viz., Nearest Neighbor Hot Deck Imputation (NNHDI), with an application to multidimensional poverty.	
Indian Institute of Science, Education & Research , Kolkata	Jun 2022 — Aug 2022
IASc-INSA-NASI Summer Research Fellow	Kolkata, WB, India
<ul style="list-style-type: none">• On Nonparametric Statistics.• Supervised by Anirvan Chakraborty in <i>Department of Mathematics and Statistics</i>. Studied different techniques in nonparametric inference and estimation: estimating statistical functionals, density estimation, curve estimation, and normal means (minimax theory), jackknife, d-deleted jackknife, and bootstrap.	
Indian Statistical Institute , Kolkata	Oct 2021 - May 2022
Research Intern	Kolkata, WB, India
<ul style="list-style-type: none">• Supervised by Dr. Subhamoy Maitra in <i>Applied Statistics Unit</i> (ASU).	

- **A Heuristic Framework to Search for Approximate Mutually Unbiased Bases:** A heuristic framework was developed to obtain optimal number of **Mutually Unbiased Bases (MUBs)** through the construction of **Approximate MUBs (AMUBs)** in dimensions $d = 6, 10, 46$ from $d' = 7, 11$ and 47 respectively. 
- **Almost Perfect Mutually Unbiased Bases that are Sparse:** As an extension to ^{**}, we propose the concept of **Almost Perfect MUBS (APMUBs)** to circumvent restrictions in construction of real MUBs, where our techniques are based on combinatorial structures. 

RESEARCH & PUBLICATIONS

My research spans **scientific machine learning**, **Bayes modeling & (approximate) Bayes theory** for real-world scientific problems, **optimization**, and **combinatorial designs/structures**.

7. **Roy, S.**, Gao, K., & Chen, T. (2025). ***SPINWAVE: Scalable Physics-Informed Neural Operator for Seismic WAVE Modeling***. (In preparation).
6. **Roy, S.**, Dey, P., Mallick, B. K., Pati, D., & Arróyave, R. (2025). *Multi-Property Materials Discovery using multivariate HierBOSSS*. (In preparation).
5. **Roy, S.**, Jaiswal P., Bhattacharya, A., Pati, D., & Mallick, B. K. (2025). *Frequentist Regret Analysis of Fractional Gaussian Process Thompson Sampling*. (In preparation).
4. **Roy, S.**, Dey, P., Mallick, B. K., & Pati, D. (2025). ***Hierarchical Bayesian Operator-induced Symbolic Regression Trees for Structural Learning of Scientific Expressions***. (**HierBOSSS**; submitted).
3. **Roy, S.**, Dey, P., Pati, D., & Mallick, B. K. (2025). *A Generalized Tangent Approximation Framework for Strongly Super-Gaussian Likelihoods*.  [arXiv:2504.05431](#) .
2. Kumar, A., Maitra, S., & **Roy, S.** (2024). *Almost Perfect Mutually Unbiased Bases that are Sparse*. **Journal of Statistical Theory and Practice** .
1. Chaudhury, S., Kumar, A., Maitra, S., **Roy, S.**, & Sen Gupta, S. (2022). *A Heuristic Framework to Search for Approximate Mutually Unbiased Bases*. In *Cyber Security, Cryptology, and Machine Learning*. (CSCML) 2022. *Lecture Notes in Computer Science*, Springer, Cham .

CONTRIBUTION TO SOFTWARE

R Packages on CRAN: **bayesestdft** (**Roy, S.** & Lee, S. Y., 2025), **GoodFitSBM** (Ghosh, S., **Roy, S.**, & Pati, D., 2024), **gamblers.ruin.gameplay** (**Roy, S.**, 2022), **YatesAlgo.FactorialExp.SR** (**Roy, S.**, 2021, Selected for a talk in the **useR** regional conference in Basel, Switzerland, July 2023).

SKILLS

- **Programming Languages & Technical Skills:** JAVA, C, C++, \LaTeX , Markdown, Git, & MS Platforms.
- **Statistical Software:** R (**RStudio**, **RStan**, **RShiny**) & Python (**PyTorch**, **Sklearn**, **Pandas**, **Numpy**, **OpenCV**).

AWARDS & FELLOWSHIPS

- **NSF Travel Grant & TAMU Statistics Department Student Travel Award** (for IISA 2024). 
- Awarded **Targeted Proposal Teams (TPT)** grant & scholarship by Texas A&M University. 
- Selected to attend **CMS³-FAST Summer School (2024)** in Texas A&M University. 
- Awarded the **R.C. Bose Memorial Book Prize (2022)** by Calcutta Statistical Association. 
- Awarded the **IASc-INSa-NASI Science Academies Summer Research Fellowship (2022)**. 
- Recipient of the **OPHI, University of Oxford - Summer School Grant (2022)**. 
- Awarded the **IAOS 2022 Conference and Travel Grant (2022)** by the World Bank. 

TALKS

- **IISA 2024:** On *Tangent Approximation for Variational Inference in different Exponential Families*. (Kochi, KL, India).

LEADERSHIP & EXTRA-CURRICULAR ACTIVITIES

- **Workflow Workshop Organizer (2024—2025)**, as a part of Statistics Graduate Student Association (SGSA) - TAMU.
- **Organizing Committee Member (2019—2020)**, as a part of the annual fest ϵ δ organized by Department of Statistics, SXC Kolkata.