

Ravleen Bajaj

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Education

Simon Fraser University <i>MS in Statistics</i>	<i>Sept 2024 – Present</i>
◦ Supervisor: Dr. David Stenning ◦ Coursework: Machine Learning, Statistical Theory, Statistical Computing, Measure Theory, GLMs	

University of Delhi — BS in Statistics	<i>July 2021 – July 2024</i>
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Skills / Technologies

Programming: Python, R, Julia, Bash **ML & Statistics:** Gaussian Processes, MCMC, Bayesian Inference
Frameworks: PyMC, NumPyro, JAX, deepgp **Other:** Git, Slurm, L^AT_EX, MS Office

Projects

Emulation and Calibration using Gaussian and Deep Gaussian Processes	<i>2024 - Present</i>
◦ Built a Gaussian Process (GP) model to emulate a simulator, reducing computational cost of inference. ◦ Applied Bayesian inference using MCMC (Metropolis algorithm) for parameter estimation and calibration. ◦ Worked on a modularised calibration algorithm to reduce run-time. ◦ Evaluated predictive accuracy, uncertainty quantification, and convergence diagnostics (acceptance rates, trace plots). ◦ Using Deep Gaussian Processes in a stellar evolution model to capture/predict the changes in brightness of a given star due to underlying physical properties.	

Annealed SMC for Breast Cancer Detection	<i>2025</i>
◦ Implemented Annealed Sequential Monte Carlo (SMC) for Bayesian logistic regression in Julia. ◦ Applied the method to the Wisconsin Breast Cancer dataset to classify malignant vs. benign tumors. ◦ Estimated and visualized posterior distributions of model coefficients with credible intervals. ◦ Analyzed feature importance and algorithm diagnostics (ESS, MCMC acceptance rates) to assess performance. ◦ Next Steps: Interaction plots on selection probabilities.	

Reduction of Small-Sample Bias of GLM Parameter Estimates	<i>2025</i>
◦ Investigated the problem of small-sample bias in Maximum Likelihood Estimation (MLE) of GLM parameters. Implemented and compared three bias-reduction techniques: asymptotic bias correction, Firth's penalized likelihood method, and Bayesian-inspired log-F priors. ◦ Conducted extensive simulation studies in R to evaluate estimator bias, efficiency, and coverage probabilities across varying sample sizes and model scenarios. Demonstrated that Firth's method and log-F priors offer improved stability and reduced bias in small-sample settings relative to classical MLE. ◦ Co-authored a technical report summarizing theoretical derivations, methodological comparisons, and practical implementation guidance.	

Experience

Graduate Teaching Assistant <i>Simon Fraser University</i>	<i>Burnaby, BC</i> <i>Sep 2024 – Present</i>
◦ STAT 350: Running weekly lecture-style tutorials. Working on materials for tutorials every week, discussing examples and applications. ◦ TA in the STAT workshop which is a drop-in facility for students learning STAT 100, STAT 201, STAT 203, STAT 205, STAT 270, STAT 302 and STAT 305. ◦ Resolving queries, helping students build concepts along with discussing issues with marking and understanding exam solutions. Marking assignments, quizzes, exams and invigilating tests.	

Analyst Intern*Perfora**New Delhi, IN**Aug 2023 – Oct 2023*

- Created a web scraping model to regularly record product placement on website and give suggestive product placements to boost and monitor product-wise sales and performance of individual products and combos.
- Regular monitoring of inventory and failed orders using Power BI and Excel to identify any flaws or errors.
- Interpret and analyse sales data as per day-to-day goals and requirements including new product launches and special sales.

Data Science Intern*DMI Finance**New Delhi, IN**June 2022*

- Prepared end-to-end model journey for Data Science team consumption and documentation for model interpretation and understanding of the stakeholders.
- Model code restructuring and mapping of model documentation for efficiency.
- Interpreted and comprehended models based on algorithms like XGBoost and Logistic Regression.

Awards

2025 Graduate Fellowship - 7000 (CAD)

Organizing & Scientific Committee**President:** Department of Statistics Graduate Caucus*2025-Present***Co-Organizer:** 2025-2026 SFU/UBC Joint Statistics Seminar*2025***Volunteering****Management Lead***Google Developer Student Club**New Delhi, IN**2021-2022*

- Optimizing events around the year and creating reports post events, sessions, competitions and hackathons.
- Delivered a session on (“[Data Science 101](#)”) to familiarize community members with the basics.

Changemaker Program Volunteer, Analytics Volunteer*Pratisandhi**New Delhi, IN**Sep 2021-June 2022*

- Worked on analysis of surveys and drew relevant inferences. Curated reports for pre and post survey analysis.
- Cleaned data, performed EDA and conducted analysis on surveys conducted internally and on-ground.
- Participated in on-ground workshops on menstrual hygiene and sex-education.

Eco Commander*Paryavaran Sanrakshan Gatividhi (Govt. of India Initiative)**New Delhi, IN**Oct 2021*

- Achieved “platinum” certification for impacting 100+ individuals about sustainable homes and lifestyle.
- Adopted sustainable practices at individual level and educated community members about creative sustainable measures.

Certifications

Institution	Course	Status/Grade
HarvardX	Data Science: R Basics	Grade: 100%
HarvardX	Data Science: Visualisations	Grade: 100%
University of Delhi	Data Science Using Python (Certification Course)	Grade: A+