

Ravleen Bajaj

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Education

Simon Fraser University

Sept 2024 – Present

MS in Statistics

- **Supervisor:** Dr. David Stenning
- **Coursework:** Machine Learning, Statistical Theory, Statistical Computing, Measure Theory, GLMs

University of Delhi — BS in Statistics

July 2021 – July 2024

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

2024 - Present

- 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

2025

- 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

2025

- 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

Simon Fraser University

Burnaby, BC

Sep 2024 – Present

- **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+