Miguel Biron-Lattes

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About me

PhD in statistics with several years of research experience in computational Bayesian methods. I seek roles where I can develop and apply advanced statistical and computational methods to drive innovation. I have extensive experience in the financial industry across both private and public sectors. I am interested in research-oriented positions within technology-driven organizations, where I can apply my expertise to solve complex problems and contribute to cutting-edge advancements in the field.

Education

Ph.D. Statistics *University of British Columbia* – Vancouver, BC — Sep 2018 — Aug 2024
- Supervisors: Drs. Alexandre Bouchard-Côté & Trevor Campbell
- Thesis: "Automatic massively parallel Markov chain Monte Carlo with quantifiable error"

M.A. Statistics, *Columbia University* – New York, NY — Sep 2014 — May 2015

B.Sc.Eng. Industrial Engineering, *Universidad de Chile* – Santiago, Chile — Mar 2006 — Jul 2012
- Considers also a professional degree in Industrial Engineering

Publications

Liu, T., Surjanovic, N., **Biron-Lattes, M.**, Bouchard-Côté, A., & Campbell, T. AutoStep: Locally adaptive involutive MCMC. *ICML 2025*, PMLR 267:39624-39650, 2025.

Luu, S., Xu, Z., Surjanovic, N., **Biron-Lattes, M.**, Campbell, T., & Bouchard-Côté, A. Is Gibbs sampling faster than Hamiltonian Monte Carlo on GLMs? *AISTATS 2025*, PMLR 258:2881-2889, 2025.

Thompson, W., [...], **Biron-Lattes, M.**, et al. (2025) On the Orbit of the Binary Brown Dwarf Companion GL229 Ba and Bb. *The Astronomical Journal* 169(4), 193.

Biron-Lattes, M., Surjanovic, N., Syed, S., Campbell, T., & Bouchard-Côté, A. (2024) autoMALA: Locally adaptive Metropolis-adjusted Langevin algorithm. *AISTATS 2024, PMLR* 238, 4600-4608.

Biron-Lattes, M., Campbell, T., & Bouchard-Côté, A. (2024) Automatic Regenerative Simulation via Non-Reversible Simulated Tempering. *JASA*, 120(549), 318–330.

Biron-Lattes, M., Bouchard-Côté, A., & Campbell, T. (2023) Pseudo-marginal inference for CTMCs on infinite spaces via monotonic likelihood approximations. *JCGS*, 32(2), 513-527.

Biron-Lattes, M., Córdova, F., & Lemus, A. (2019) *Banks' business model and credit supply in Chile: the role of a state-owned bank*. BIS Working Paper No 800.

Biron-Lattes, M., & Bravo, C. (2014) On the discriminative power of credit scoring systems trained on independent samples. In *Data Analysis, Machine Learning and Knowledge Discovery* (pp. 247-254). Springer International Publishing.

Experience

Postdoctoral Fellow, *SFU Statistics* – Burnaby, BC — Dec 2024 – Present

Working with Donald Estep and Derek Bingham on uncertainty quantification in inverse problems arising from geological and geophysical applications. Currently developing a fully Bayesian surface-based model for analysis of underground resources via muon tomography. Inference is performed with a GPU-accelerated gradient-based MCMC algorithm, with both model and sampler fully implemented in JAX machine learning framework.

Senior Consultant, *UBC Statistics* – Vancouver, BC — Dec 2019 — Dec 2024

Assist graduate students from UBC in formulating an appropriate statistical methodology for their thesis research projects. Mentoring junior consultants by helping them to deal with clients, and giving them feedback on the quality of their recommendations. Topics of the projects range from forestry, to biostatistics, agriculture, and medicine, among others.

Graduate Research Assistant, *UBC Statistics* – Vancouver, BC — May 2019 — Aug 2024

Carried out research on Bayesian computational methods to tackle challenging inference problems. Published papers in high ranked journals, and presented results at prestigious international conferences.Carried out research on Bayesian computational methods to tackle challenging inference problems. Published papers in high ranked journals, and presented results at prestigious international conferences.

Senior Financial Stability Analyst, *Financial Market Commission* – Santiago, Chile — Aug 2015 — Aug 2018

Investigated potential threats to the financial stability of the Chilean banking system by analyzing multiple data sources in order

to produce actionable insights. In particular, this required processing massive databases with account-level data collected from banks using `SQL` and then analyzing them with `R`. Additionally carried out research projects on the topic of financial stability:

- Participated in an international collaborative research project coordinated by the Bank of International Settlements (BIS), aimed at understanding the relationship between banks' business models and the overall supply of credit.
- Developed a method for Bayesian inference of default correlations by leveraging probability of default (PD) models
- Built a systemic risk indicator for retail loans using account-level and macroeconomic data
- Carried out a systematic comparison of the performance of statistical learning models for credit scoring
- Estimating the joint distribution of implicit bank PDs from market transactions of time deposits

Financial Engineering Analyst, *CLGroup Financial Services Cons.* – Santiago, Chile Feb 2011 — Jun 2014

Lead a wide array of projects on quantitative modelling of market and credit risk for financial institutions. Notable examples:

- Quantifying counterparty credit risk exposure of an interest rate swaps portfolio
- Developing the market risk framework for a Central Counterparty of OTC derivatives
- Assessing the credit risk exposure of a government-backed portfolio of student loans
- Constructing probability of default models at multiple banks for credit risk management

Projects

`nrpt`: A JAX-based, NumPyro-compatible implementation of Non-Reversible Parallel Tempering

- A Python package for parallel tempering (a.k.a. replica exchange) for fast and robust Bayesian inference for NumPyro models.
- Role: author and maintainer.
- Repo: github.com/Estep-Bingham-Lab/nrpt
- Tools used: Python, JAX

`Pigeons.jl`: Distributed and parallel sampling from intractable distributions

- A Julia package to approximate challenging posterior distributions, and more broadly, Lebesgue integration problems.
- Role: co-author.
- Repo: github.com/Julia-Tempering/Pigeons.jl
- Tools used: Julia, MPI, Automatic Differentiation

Technical skills

Languages: English (fluent), Spanish (native).
Programming languages: Julia (advanced), R (advanced), Python (advanced), Bash (intermediate), MATLAB (intermediate), C/C++ (basic), Java (basic).
Machine learning and probabilistic frameworks: NumPyro (advanced), JAX (advanced), Stan (advanced), Turing (advanced).
Version control: Git (advanced).
Containerization: Docker (intermediate).
Cluster schedulers: Slurm (advanced), PBS (advanced).
Query languages: Oracle SQL (advanced), Transact-SQL (advanced).
Distributed computation: MPI (intermediate).
Workflow systems: Nextflow (advanced).
Spreadsheets: Microsoft Excel (advanced).
Document typesetting: LaTeX (advanced).