Erik Drysdale

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Professional Experience

July 2024 – present

Eli Lilly, Indianapolis
Machine Learning Scientist – *TuneLab*

- Developed conformal inference frameworks (split, studentized, and localized variants) to deliver calibrated uncertainty estimates for state-of-the-art molecular property predictors trained across distributed data sources
- Designed and implemented a suite of new product forecasting tools to produce automated monthly forecasts for 200 profit centers and improved base case accuracy by 1-3pp and saved 1,000+ hours per year
- Provided first-ever Lilly Direct daily forecasting tool by ingesting shipping log data to estimate vial Rx and improved accuracy by 1-2pp compared to existing approach

Feb 2022 – May 2024

Boston Consulting Group (BCG), Toronto
Senior Data Scientist – *GAMMA*

- Took full product ownership and managed a team of six technical staff and built a suite of three ML-driven applications using ML and conformal prediction
- Developed custom solutions which solved complex business problems including marketing campaigns, clinical trial outcomes, and next-best action systems
- Supported two-dozen teams as a "Delivery Excellence" coach by providing thought partnership and support for best practices around coding and statistical modeling

Jun 2018 – Feb 2022

The Hospital for Sick Children (SickKids), Toronto
Machine Learning Specialist – *AI in Medicine Initiative*

- Developed & validated the first ML model in the hospital to complete a *silent period* trial
- Used a full suite of machine learning algorithms for more than five projects including CNNs, transformers, kernel methods, tree-based methods, and linear models
- Developed novel statistical protocols for validating regression and classification models for the hospital's research ethics board

Sep 2017 – Jun 2018

Ontario Institute for Cancer Research – Boutros Lab, Toronto
Data Scientist & Bioinformatician – *Adaptive Oncology*

- Used multitask machine learning techniques to improve the concordance index on the risk scores of prostate cancer patients
- Aligned and analyzed more than 100 whole exome sequences for patients with vasovagal syncope to perform rare-variant discovery

Sep 2014 – Jun 2016

Bank of Canada, Ottawa & Vancouver
Economist – *Canadian Economic Analysis Department*

- Implemented and back-tested forecasting models for a 6-month time horizon for the Canadian housing market using time series models
- Summarized technical output for senior management to support decision making on policies related to interest rates and financial stability

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Technical Skills

Academic	◦ Conformal prediction, selective inference, and double machine learning
Python	◦ Primary language for developing end-to-end machine learning and data science pipelines
	◦ Expertise with core data-science libraries: `sklearn`, `PyTorch`, `numpy`, `pandas`, etc
R	◦ Plotting with `ggplot2`, interactive plots with `Shiny`, data-wrangling with `tidyverse`
Shell scripting	◦ High performance computing resources used for model training and statistical simulations
	◦ Data science pipelines developed in Linux-like environment
Git	◦ Used for all individual and team projects

Selected Publications

[1] Drysdale (2023). "A multitask neural network trained on embeddings from ESMFold can accurately rank order clinical outcomes for different cystic fibrosis mutations". *bioRxiv:2023.10.26.564274*.

[2] Drysdale (2023). "A parametric distribution for exact post-selection inference with data carving". *arXiv:2305.12581*. stat-ML.

[3] Drysdale (2022). "SurvSet: An open-source time-to-event dataset repository". *arXiv:2203.03094*. stat-ML.

[4] Drysdale et al. (2020). "Forecasting Emergency Department Capacity Constraints for COVID Isolation Beds." *arXiv:2011.06058*. stat-ML.

[5] Drysdale et al. (2019). "Implementing AI in healthcare." *Vector-SickKids Health AI Deployment Symposium*.

[6] Drysdale et al. (2019). "The False Positive Control Lasso." *arXiv:1903.12584*. stat-ML.

[7] Drysdale et al. (2019). "A population-based study of the treatment effect of first-line ipilimumab for metastatic or unresectable melanoma." *Melanoma Research*. 2019 Dec;29(6):635-642.

Selected Posts

[1] De-biasing standard deviation estimators *June 30, 2024*.

[2] Can a fine-tuned GPT-3 write univocalic poems (Eunoia-style)? *Jan 26, 2023*.

[3] paranet: Parametric survival models with elastic net regularization *Sep 12, 2022*.

[4] Statistically validating a model for a point on the ROC curve *Feb 1, 2022*.

[5] Preparing a binary classifier for a statistical trial *Jun 27, 2020*.

[6] Elastic Net Exponential model for censored data *Jun 15, 2019* .

[7] A convex approximation of the concordance index (C-index) *Aug 22, 2018* .

Education

2016–2017	**MSc. in Statistics, Queen's University** (GPA: 100%) Thesis: *The Self-Tuning Lasso in Double Machine Learning*
2013–2014	**M.A. in Economics, Queen's University** (GPA: 100%) Thesis: *Bayesian and Classical Forecasting of Canadian Macroeconomic Time Series* Awards: Best MA Thesis (Scarthingmoor Prize)
2008–2013	**B.A. in Honours Economics, Simon Fraser University** (GPA: 92%) Thesis: *Housing Supply Elasticities within the Lower Mainland from 1998 to 2012* Awards: Best B.A. Thesis and Student (Jack Knetsch and Cliff Lloyd Memorial Award)