Alexander De Costa

ML Engineer — U of T Mathematics & Probability Graduate
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Current modeling work confidential; please contact for details.

Summary

- ML engineer with a rigorous foundation in mathematics and probability, specializing in interpretable and probabilistic machine learning.
- Experienced in building hybrid architectures such as Deep Kernel Learning, Bayesian RNNs, and uncertainty-aware forecasting models (e.g., DeepAR, MC Dropout).
- Skilled at designing production-grade systems that blend statistical insight with scalable ML engineering.

Technical Skills

Machine Learning: Models from first principles (logistic regression, ensembles); Gaussian Processes, Bayesian hierarchical models, classical and modern time series (ARIMA, Prophet, state-space, deep learning).

Deep Learning: LSTMs, Transformers, Temporal Fusion Transformers, GANs, diffusion models; LLMs and hybrid neural-probabilistic methods (Deep Kernel Learning, Bayesian RNNs, variational models).

Mathematical Research: Functional analysis (Banach & Hilbert spaces), spectral methods, and high-dimensional probability applied to algorithm design in ML.

Tools & Frameworks: Python, PyTorch, Jupyter, RStudio, SQL, scikit-learn.

Infrastructure (in progress): FastAPI, Docker, Kubernetes, MLflow, Airflow, Terraform, Prometheus, AWS, Git.

Education

University of Toronto *Sep 2020 – May 2025*
BSc, Mathematics and Its Applications (Probability/Statistics)
Relevant coursework: Measure Theory (MAT1000), Functional Analysis (MAT1001), Mathematical Statistics (STA452), Stochastic Processes (STA2006), Operator Theory (MAT1011).

Experience

RiskScope *Jun 2025 – Present*
Co-founder & Lead ML Consultant

- Developed modular, interpretable ML systems for time series and probabilistic modeling, leveraging Gaussian Processes, Bayesian neural networks, and hybrid architectures like Deep Kernel Learning and Bayesian RNNs.
- Benchmarked custom models against state-of-the-art deep learning architectures (e.g., LSTMs, Temporal Fusion Transformers, Transformer-based sequence models).
- Built scalable forecasting pipelines that integrate classical statistical approaches with modern deep probabilistic methods (e.g., DeepAR, MC Dropout).

Manulife *Jan 2023 – May 2023*
Actuarial Student – Experience Analytics

- Updated experience monitoring reports via data extraction and validation (R, SAS, SQL); collaborated cross-functionally to improve study programs supporting valuation and pricing models.