

# Alexander De Costa

U of T Mathematics & Statistics Graduate

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Current modeling work confidential; please contact for details.

## Experience

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### RiskScope

*Jun 2025 – Present*

Co-founder & ML Consultant

- Building and deploying end-to-end machine learning pipelines for fraud and anomaly detection in production environments
- Achieved an average precision of 0.4 on a highly imbalanced dataset (0.129% fraud rate), with ongoing improvements targeting 0.6–0.7.
- Developed a flexible framework enabling rapid generation of strong fraud detection models for diverse use cases within 1–3 hours.

### Manulife

*Jan 2023 – May 2023*

Actuarial Student – Experience Analytics

- Maintained and validated experience monitoring reports used by senior actuarial leadership to inform assumption setting and risk decisions.
- Partnered with valuation and pricing teams to modernize analytics workflows, improving data accuracy and business impact.
- Enhanced reporting efficiency by streamlining data handling processes and improving code documentation across R, SAS, and SQL.
- Developed interactive dashboards and automated reports in Excel and QlikView, leveraging financial and risk analysis techniques to deliver actionable insights for business and actuarial teams.

## Personal Projects

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### Algorithm Development for Distributionally Robust Portfolio Optimization

*July 2025 - Present*

- Implementing state-of-the-art DRO portfolio optimization methods that improve Sharpe ratio by 10–30% and reduce volatility by up to 15% compared to their non-DR counterparts, with especially strong gains in volatile markets.
- Applying advanced probability theory and custom concentration inequalities on ambiguity sets and risk measures to further enhance portfolio performance.

### AutoML for Tabular Datasets

*May 2025 - July 2025*

- Built a modular AutoML engine to reduce tuning time to under one hour on typical tabular datasets.
- Combined heuristic-driven feature/model selection with Bayesian optimization for efficient pipeline search.
- Continuously adding new models and feature engineering methods to boost performance and flexibility.

## Education

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### University of Toronto

*Sep 2020 – May 2025*

BSc, Mathematics and Its Applications (Probability/Statistics)

Relevant coursework: Measure Theory (Graduate course), Functional Analysis (Graduate course), Stochastic Processes (Graduate course), Operator Theory (Graduate course), Mathematical Statistics, Optimization

### Society of Actuaries

Passed Exams P (Probability) and FM (Financial Mathematics)

## Professional Skills

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- Strong communicator skilled at translating advanced math into actionable models for technical and business audiences.
- Collaborative, self-directed, and comfortable leading modeling efforts end-to-end.
- Experienced in technical writing, mentoring, and presenting models in high-stakes settings.