

Nicholas Fung

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Experience

Riskfuel Analytics ✉

Sep 2021 – Dec 2023 | Toronto, Canada

ML Engineer

- Developed deep learning models to accelerate structured product pricing and tailored model complexity to suit client performance requirements. On GPU, these models ran over 1,000,000x faster compared to traditional Monte-Carlo pricers, while maintaining sub-0.1% errors, transforming nightly pricing processes into real-time processes.
- Designed schemas for financial data, and orchestrated custom transformations using DAG workflows, using Pulsar to aggregate streaming data from over 200 on-prem and cloud nodes to produce millions of data points for training.
- Implemented systematic outlier detection methods, leveraging programmatic and statistical techniques using Python's scientific computing libraries. This reduced data anomalies, leading to higher model performance.
- Led pilot projects with global investment banks, defining project scope, coordinating engineering efforts, and delivering models. This resulted in significant reductions in compute costs for clients.

Riskfuel Analytics ✉

Apr 2020 – Aug 2020 | Toronto, Canada

Research Associate

- Created scalable workflows by containerizing runtime environments using Docker, and orchestrating workloads using Kubernetes on an on-prem cluster with 50+ nodes. This reduced downtime and maximized cluster utilization.
- Accelerated Scotiabank's exotic option pricing by implementing innovative data generation strategies and training deep learning models to reach 800,000x in pricing throughput compared to previous methods.
- Implemented a CI/CD pipeline that automated unit testing and image building using GitHub Actions. This reduced build times by 40%, standardized code development processes, and improved observability through versioning.

Non-Invasive Surgical Innovations

Apr 2018 – Aug 2018 | Hong Kong

Software Engineer

- Deployed a model for real-time colorectal tumor detection with sub-50 ms latency by aggregating a dataset of over 3,000 scraped and annotated images, and training a Convolutional Neural Network using the YOLOv3 architecture.
- Implemented noise reduction and edge enhancement techniques to improve image clarity for better diagnostic accuracy, using CUDA in C++ for the Jetson TX2 embedded computing module.

Education

University of Toronto

Toronto, Canada

MASc, Computer Engineering

Specialization in Machine Learning with Financial Applications

- Variational autoencoders for option pricing. Applications in risk management and exotic derivative pricing. *Publication* ✉
- Fine-tuned a pretrained BERT LM on earnings calls to predict investor sentiment and future returns.

Select Awards

- Bell Scholarship: Awarded to 3 graduate students in ECE.
- Mitacs Accelerate Fellowship: Awarded to graduate students for research collaborations with an industry partner.

University of British Columbia

Vancouver, Canada

BASc, Computer Engineering

Graduated with Distinction

Select Awards

- Dean's Honour List: Maintained an average of 80% or above.
- Awarded the Trek Scholarship: Awarded to the top 5% of undergraduate students in their year and department.

Skills

Machine Learning and Data Science

PyTorch, TensorFlow, HuggingFace, NumPy, Pandas, scikit-learn, matplotlib, plotly, spaCy, Scrapy

DevOps & Infrastructure

Docker, Kubernetes, AKS, Git, GitHub Actions, NVIDIA Triton Inference

Programming Languages

Python, SQL, Julia, Rust, C, C++, Java

Data Engineering

Pulsar, Kafka, Spark, Redis, Celery, MongoDB

Technical Competencies

Deep learning, NLP, LM, computer vision, MLOps, data engineering, data analysis and visualization, CI/CD, quantitative modelling, scientific computing

Web Development & APIs

Flask, Django, FastAPI

Certificates

Certified Kubernetes Administrator (CKA) ✉

Certification ID: LF-hkyfxltp2j