Nicholas Fung

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Experience

Riskfuel Analytics Sep 2021 – Dec 2023 | Toronto, Canada
ML Engineer

- Engineered deep learning models to accelerate structured product pricing, and tailored model complexity to suit client performance requirements. When run on GPUs, these models resulted in throughputs up to 1,000,000 faster compared to traditional Monte-Carlo pricers, while maintaining errors below 0.1%. This transformed nightly pricing processes into real-time processes.
- Designed schemas for financial data, and orchestrated custom transformations using DAG workflows. Leveraged Apache Pulsar to preprocess and aggregate streaming data from over 200 on-prem and cloud based nodes to produce millions of tabular data points for training.
- Designed systematic methods for identifying outliers and erroneous data points, leveraging both programmatic and statistical techniques using Pandas and other Python's scientific computing libraries, to significantly reduce the number of outliers and exceed client requirements.
- Led pilot projects for several global investment banks. Responsible for defining the scope of work with the client, coordinating requirements between engineering teams, and delivering the final model.
- Implemented a specialized deep learning model for BMO Capital Markets to fit as well as generate synthetic prices for illiquid option markets.

Riskfuel Analytics Apr 2020 – Aug 2020 | Toronto, Canada
Research Associate

- Created highly reliable and scalable workflows by containerizing runtime environments using Docker, and orchestrating workloads using Kubernetes on an on-prem cluster with 50+ nodes.
- Accelerated exotic option pricing models for Scotiabank's risk management by implementing novel synthetic data generation strategies for high dimensional data, and training deep learning models to reach speedups of over 800,000x in pricing throughput compared to traditional numerical methods.
- Implemented a CI/CD pipeline that automated unit testing and image building using GitHub Actions, improving developer workflows by reducing build times by 40%.

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 using Nvidia's CUDA API in C++ for the Jetson TX2 embedded computing module.

Education

MASc, Computer Engineering Toronto, Canada
University of Toronto
Thesis: Machine Learning with Financial Applications
Awards: NSERC CGS-M, Mitacs Accelerate, Bell Scholarship

BASc, Computer Engineering Vancouver, Canada
University of British Columbia
Graduated with Distinction, Dean's Honour List
Awards: Martin Sikes Award, MacKenzie Swan Scholarship, Trek Scholarship

Skills

Data Science and ML Technologies
PyTorch, Tensorflow, NumPy, Pandas, numba, matplotlib, plotly, scikit-learn, SQL, Julia, Apache Pulsar

Other Technologies
Docker, Kubernetes, AKS, Git, GitHub Actions, Flask, Django, FastAPI, NVIDIA Triton Inference, Rust, C/C++

Technical Skills
Data analysis, data visualization, scientific computing, quantitative modelling, deep learning, NLP, computer vision, MLOps, API development, CI/CD

Certificates

Certified Kubernetes Administator (CKA)
Certification ID: LF-hkyfxltp2j