

ZEYING(ING) TIAN

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SUMMARY

Software Engineer building scalable, high-throughput distributed systems in **Golang** and **C++**, and **ML and recommendation infrastructure** in **Python**. Specialize in dual-tower retrieval, ranking systems, and end-to-end indexing & serving pipelines spanning model training, validation, and online serving. Strong practitioner of **LLM/Claude-driven development (harness engineering)** to accelerate delivery. Hands-on across **Kubernetes**, **Kafka/NATS** messaging, and **vector databases**.

EDUCATION

PhD in Operations Research, University of Toronto Fall 2027 (Incoming)
Mechanical & Industrial Engineering (MIE), under Prof. Roy H. Kwon

Bachelor of Computer Engineering, McGill University 2019 - 2023
CGPA 3.99 - Dean's Honour List - Full Scholarship

PUBLICATION

Kang, Shaofeng, and Zeying Tian. "Optimal Portfolio Construction—A Reinforcement Learning Embedded Bayesian Hierarchical Risk Parity (RL-BHRP) Approach." *arXiv preprint* arXiv:2508.11856 (2025).

Li, Dailun, Zeying Tian, and Yining Duan. "Self-attention on RNN-based text classification." *In International Conference on Computer Network Security and Software Engineering (CNSSE 2022)*, vol. 12290, pp. 20-25. SPIE, 2022.

SKILLS

- Language: C/C++, Golang, Java, Python (Pandas, Numpy, Tensorflow, Scikit-learn, PyTorch), JS/TS
- RPC Frameworks (Thrift, gRPC, kitex), RESTful Frameworks (Spring, Django)
- Infrastructure: Kubernetes, Docker, distributed systems, microservices
- Messaging: Kafka, NATS, message queues (MQ)
- Redis, MySQL, Mongo, Vector Databases (Elasticsearch, Faiss, Viking), Graph Database (ByteGraph)
- Machine Learning Models: XGBoost, VGG, BERT, BART, Seq2Seq, Dual-Tower Models, LSTM, GRU
- Cloud Computing: S3, EC2, ECR, ECS, RDS, AWS Glue, Firehose, Lambda, SNS, QuickSight, Athena

EXPERIENCE

Software Engineer, Recommendation Systems Jan 2026 - Present
Electronic Arts (contract via Hatch Innovations) Toronto, ON, Canada

- Architect and build full-fledged recommendation systems for EA's AI-driven products, including dual-tower retrieval and ranking systems.
- Designed end-to-end indexing & serving pipelines spanning model training, validation, and low-latency online serving; built scalable, high-throughput backend services in **Golang**.
- Developed model and data training pipelines in **Python**; integrated **Elasticsearch** and vector databases for embedding retrieval.
- Employed **Kafka**, message queues, and **NATS** for decoupling, traffic shaping, and higher throughput across services.

Freelance Quantitative Researcher Apr 2023 - Present
Independent Toronto, ON, Canada

- Designed and built an end-to-end quantitative trading system with a collaborator, trading Forex, commodities, and indices via the **OANDA** API.
- Developed signal generation and model research in **Python**; built the execution engine and infrastructure systems in **Golang**.
- Deployed the platform on **AWS**, using ECS for containerized services and SageMaker for model training and serving, alongside supporting AWS infrastructure.

- Authored "Optimal Portfolio Construction – A Reinforcement Learning Embedded Bayesian Hierarchical Risk Parity (RL-BHRP) Approach" (arXiv:2508.11856), combining reinforcement learning with Bayesian hierarchical risk parity.

Senior Software Engineer (Level 2-1)

TikTok Inc.

Nov 2023 - Apr 2025

San Jose, CA, U.S.

- Received an **Exceptional** performance review (highest rating in the department).
- Built a similarity-based tracking pipeline for creative asset consumption. Utilized a dual-tower vision model to extract video embeddings and applied ANN (Approximate Nearest Neighbor) algorithms to retrieve similar videos from a vector database within milliseconds. Results were written to ByteGraph for persistent tracking. Enabled quarterly tracking of \$200M in advertising creative spend.
- Developed an ad signature RPC service in C++ (gRPC) for creative deduplication and quality content boosting that could handle 50k QPS. Leveraged a neural network with importance pooling to generate video embeddings, which were used to retrieve similar content from a Faiss database. Content tags were written to a Redis database and served to the ads delivery engine for real-time decision making.
- Integrated ffmpeg-based processing to support Adobe XMP metadata tracking, parsed and stored content meta-data in a NoSQL database, and synchronized it via offline pipelines to Hive tables for downstream data engineering tasks. The full pipeline supported tracking of \$60M in creative spend every 2 weeks.

Co-op Software Development Engineer (Intern)

Ericsson AI Lab (GAIA)

Sept 2022 - Apr 2023

Montreal, Canada

- Worked on the NodeCache for JAMScript for nodes to discover each other in an IoT setting.
- Wrote a simulation program in C++ to verify the mobility of nodes in JAMScript.
- Implemented one-shot machine learning models to detect malicious smart contracts with time-series data.

Software Development Engineer (Intern)

Amazon Inc.

May 2022 - Aug 2022

Toronto, Ontario, Canada

- Designed and implemented a service that archives and creates visual analysis for incoming fulfillment data.
- Transformed incoming SNS data with Lambda, output to S3 via Firehose, and queried with Athena for Quick-Sight dashboards.

Research Assistant (Under Prof. Muthucumaru Maheswaran)

McGill University

Nov 2021 - Jan 2023

Montreal, Quebec, Canada

- Developed the language compiler with the Ohm language parser that translates JAMScript into C and JS.
- Designed CFG grammar and language parser to support ES6 and JAMScript-specific syntax.
- Recorded and generated the incoming program's side effect table and control flow graph.

Software Development Engineer (Intern)

TikTok

Apr 2021 - Aug 2021

Shanghai, China

- Developed a tool to model the landing page's structure in TypeScript, later used in the project refactor.
- Helped develop the interim download page, which generated \$1,000,000 in daily revenue.

AWARDS AND CERTIFICATES

- Top 4 teams in Canada, **IEEEExtreme 2021, Canada** Nov 2021
- Hatch Scholarships (\$10,000, awarded 2021 & 2022), **McGill University, Canada** July 2022
- Excellence Bursaries for ECSE students (\$10,000), **McGill University, Canada** Apr 2021
- The Rio Tinto – Richards Evans Intl. Exchange Award (\$10,000), **McGill University, Canada** Aug 2020