Haotian Yang

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Education

The University of British Columbia 2021/09 – 2022/12
M.Eng, Electrical and Computer Engineering, focus in Distributed System Vancouver, BC

The University of Toronto 2016/09 – 2021/05
H.B.Sc Computer Science, graduated with Distinction Toronto, ON

- Mathematical and Computational Sciences Honour Roll, ALPHA
- Undergraduate Research Grants, 2021
- Teaching Assistant for CSC263(Data Structures and Analysis Winter 2021), CSC311(Introduction to Machine Learning Fall 2020), CSC324(Principles of Programming Languages Fall 2020), CSC108(Introduction to Computer Programming Winter 2020)

Work Experience

Fortinet 2023/02 – 2024/07
Embedded Software Development Engineer Vancouver, BC

- I developed and maintained the IPsec VPN for FortiOS.
- **TCP support for IKEv2 and IPsec**: Implemented RFC 8229 that encapsulates the IKEv2 and IPsec traffic in TCP to bypass the firewall.
- **VPN tunnel connectivity**: Developed a automatic way for detecting connectivity of VPN tunnel using RAW ICMP socket.
- **Automatic Transport for IPsec VPN**: Developed a protocol that automatically switches the transport protocol for IPsec VPN between UDP and TCP based on the network condition.
- **FortiOS Reliablity**: Analyzed and fixed Kernel Panics, and analyzed and optimized system performance.

ByteDance 2022/04 – 2022/11
Search Engine R&D Intern, Lark Search & AI team ShenZhen, China

- I developed and maintained the backend of the Multi-Geo Search Engine.
- **Index Rebuilding**: Proposed and implemented a **configurable index rebuilding framework** for the **Multi-Geo Search Engine** that solved performance issues. Within one month, the throughput of the index rebuilding service **improved from 150QPS to about 1800QPS(13x)**.
- **Cloud Storage**: Cross-departmental cooperation developed the cloud storage management service for the search engine. Analyzed the performance issues, and **optimized query latency by ∼50%** by reducing cross-region RPC calls.
- **Rank**: Developed a ranking strategy for a Multi-Geo search engine in an empty query search scenario.
- **Content Abstraction**: Implemented the dynamic content abstraction service for the search engine, which solved the semantic incompleteness problems and improved user satisfaction indicator by ∼10%.
- **Risk Control**: Built a risk control module for the retrieval phase in the search engine that downgrades the search capability for suspicious users.

Open-Source Contributions

Zed github.com/zed-industries/zed

- PR: Added support for detecting the vi_mode state in the keybinding context. Allow user to define and use the keybinding when the terminal is in vi_mode.
- PR: Implemented incremental project search in Zed with debounced auto-search and using generation-based gating for stale-run protection.

TinyKV github.com/iyht/tinykv

- Built a Bitcask-inspired, log-structured key-value store optimized for high-throughput writes and single-seek reads. Implemented append-only data files with write-ahead logging (WAL), and an in-memory skip list index.

Research Experience

Far Data Lab at University of Toronto 2024/07 – 2025/01
Researcher Toronto, ON

- Conducted a large-scale empirical study on how federated learning impacts model accuracy across text, image, audio, and video using state-of-the-art models and a unified Flower-based framework, and identified when FL accuracy degradation is severe vs. negligible.

MEDCVR at University of Toronto 2020/05 – 2021/04
Research Assistant Toronto, ON

- Real-time Depth Estimation: Designed and developed a real-time (processing images with a resolution of 1280×1024 pixels beyond 60 fps) coarse-to-fine self-supervised stereo matching neural network for disparity estimation.

Publications

- An Empirical Study of the Impact of Federated Learning on Machine Learning Model Accuracy. Haotian Yang, Zhuoran Wang, Benson Chou, Sophie Xu, Hao Wang, Jingxian Wang, Qizhen Zhang, arXiv:2503.20768, 2025
- Real-time Coarse-to-Fine Depth Estimation for Stereo Endoscopic Image with Self-supervised Learning. Haotian Yang, Lueder A. Kahrs. IEEE International Symposium on Biomedical Imaging(ISBI), 2021.
- Locating Bugs in CS1 Code with Recurrent Neural Networks. Lucas Roy, Haotian Yang, Lisa Zhang. Sixth SPLICE Workshop at L@S, 2020.