Yunjia Zheng

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Education

McGill University *Montreal, Quebec, Canada*
Master of Computer Science *09/2023 - 05/2025*
- GPA: 4.0/4.0, Master's Thesis:"View Management for Graph Databases"

Bachelor of Science (Honors. Computer Science) *09/2019 - 05/2023*
- GPA: 4.0/4.0, Faculty of Science Scholarship, Dean's Honour List

Research Experience

Master Thesis (Supervised by: Prof. Bettina Kemme) 10/2023 – 12/2024
McGill University *Montreal, Quebec, Canada*
- Categorized views in graph databases into four types. Extended the popular graph query language Cypher to support views. Implemented a compiler that translates the extended language to native Cypher for execution.
- Implemented a middleware to manage views in Neo4j, a native graph database, and Kuzu, a graph database with relational engine.
- Developed a benchmark including over 120 unseeded usage queries on 72 views varying in complexity and adapted LDBC benchmark queries.
- Summarized the optimal scenarios for using each type of view. In general, the overall average runtime for view usage is only 18% and 3% of the baseline queries in Kuzu and Neo4j respectively

Summer@EPFL program (Supervised by: Prof. Sanidhya Kashyap) 07/2023 – 09/2023
École polytechnique fédérale de Lausanne (EPFL) *Lausanne, Switzerland*
- Developed a lock contention detection framework by monitoring the call stack causing runtime cache misses. Verified the feasibility and the stability of this method on various locks including file lock, LRU lock and mmap semaphore.
- Modified lock behavior on the fly using kernel live patching, which is able to resolve the lock contention without rebooting.
- Built an automated pipeline to analyze source code causing contention, generate the patch and apply customized policies through the SynCord framework.

Research Assistant (Supervised by: Prof. Bettina Kemme) 04/2022 – 06/2023
McGill University *Montreal, Quebec, Canada*
- Characterized representative ML-SQL hybrid workloads for benchmarking the interference pattern between ML jobs and SQL queries.
- Provided a PyTorch-like API for users to define customized models, where the training state could be paused and easily restored. Combining this new paradigm and RPC routine, the training process is managed within the database for minimal data transfer cost.
- Built a scheduler for in-database ML execution based on prediction of ML execution time and resource usage, which gives up to 2.9x faster response time. The scheduler also monitors and reacts to runtime interference.

Summer Research Internship (Supervised by: Prof. Oana Balmau) 05/2021 – 08/2021
McGill University *Montreal, Quebec, Canada*
- Explored an adaptive indexing schema for RocksDB which sorts data according to the read requests. The read throughput increases by around 10%.
- Extended database cracking algorithm from purely in-memory database to on-disk database. Prototyped an alternative layout on disk that partitioned the SSTables by hot range boundaries.

Summer Research Internship (Supervised by: Prof. Bettina Kemme) 05/2020 – 08/2020
McGill University *Montreal, Quebec, Canada*
- Designed workloads with different read/write ratio, query complexity and data sources to collect network traces of cloud services accessing databases.
- Created call graph for web services to better visualize the communication.

Publication

[VLDB'25] G-View: View Management for Graph Databases 04/2025
Yunjia Zheng, Charlotte Sacré, Mohanna Shahrad, Owen Lipchitz, Yu Ting Gu, Bettina Kemme

[ICDEW'24] Towards View Management in Graph Databases 04/2024
Mohanna Shahrad,Yu Ting Gu, **Yunjia Zheng**, Bettina Kemme

[AIDB@VLDB'23] DBMLSched: Scheduling In-database Machine Learning Jobs 11/2023
Yunjia Zheng, Yuxuan Tian, Joseph Vinish D'Silva, Bettina Kemme

[Agric.23]A modularized parallel distributed High-Performance computing framework for simulating seasonal frost dynamics in Canadian croplands. 11/2023
Ziwei Li, Zhiming Qi, Yuchen Liu, **Yunjia Zheng**, Yi Yang

[NetSoft'21] Flow-based Service Type Identification using Deep Learning 07/2021
Mona Elsaadawy, Petar Basta, **Yunjia Zheng**, Bettina Kemme, Mohamed Younis

Funding

***Fonds de recherche du Québec – Nature et technologies* (*FRQNT*)** 2024
dossier number: 2024-2025-B1X-351544 (master's training scholarship)
Awarded to the top 10 applicants from across Quebec in each domain, based on academic excellence and research potential.

Awards & Honors

Laurie Hendren Memorial Prize 2023
Awarded on the basis of outstanding academic achievement to a graduating undergraduate student enrolled in an Honors Computer Science program

Science Undergraduate Research Award 2022
Funding of a 4-month research project for undergraduates with excellent academic record and research experience.

Feng Qian Award for Undergraduate Research 2021
For outstanding undergraduate students on the basis of academic merit.