Xiangju Zhu

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Education

The University of Hong Kong — Hong Kong SAR, China
Ph.D. Candidate in Computer Science — *Dec. 2023 – Present*

Tianjin University — Tianjin, China
B.Eng in Computer Science | CGPA: 92/100 — *Sep. 2019 – Jun. 2023*

Experience

AI Framework and Data Lab, Huawei 2012 Laboratories — Hong Kong SAR, China
Research Intern, Agent Memory — *Jul. 2026 – Jan. 2027*

- Designed a scalable, graph-augmented long-term memory framework for LLM agents, enhancing multi-turn retrieval precision by **63%** via hybrid semantic-temporal indexing.
- Developed adaptive memory consolidation and eviction pipelines, significantly cutting storage footprint and query latency while improving complex task success rates on benchmarks.

Publications

- **Xiangju Zhu**, Mohammad Matin Najafi, Chrysanthi Kosyfaki, Xiaodong Li, Reynold Cheng, Laks Lakshmanan. "**BEACON: A Benchmark for Efficient and Accurate Counting of Subgraphs**". *IEEE International Conference on Data Engineering (ICDE)*, 2026.
- Yajun Yang, Hanxiao Li, **Xiangju Zhu**, Junhu Wang, Xin Wang, Hong Gao. "**HR-Index: An Effective Index Method for Historical Reachability Queries over Evolving Graphs**". *Proceedings of the ACM on Management of Data (PACMMOD)*, 2023.
- **Xiangju Zhu**, Reynold Cheng, Laks V.S. Lakshmanan, Xiaodong Li, Chenhao Ma, Mohammad Matin Najafi. "**Detection, Measurement, and Mitigation of Echo Chambers in Social Networks: A Survey**". *IEEE Data Engineering Bulletin*, 2025.

Research Experience and Projects

Echo Chamber Core Detection in Social Networks | *In submission* — January 2024 – Present

- Formulated Echo Chamber Core detection as a Purity-Aware Densest Subgraph problem combining structural density and stance entropy; proved NP-hardness and inapproximability
- Designed PADS-H, a greedy algorithm achieving 2×+ speedup over baselines and <2s runtime on 1.67M-node graphs; applied to EC detection and polarization mitigation across real-world datasets

Dense Subgraph Discovery with Negative Weights | *To be submitted* — November 2025 – Present

- Proposed CEP (Contraction–Expansion–Pruning), a scalable heuristic that outperforms peeling-based baselines on 60%+ of instances with 13×+ average speedup across 11 real-world and 175 synthetic graphs up to 10^7 nodes
- Designed CQM, a QPBO+MIQP pipeline delivering user-specified accuracy bounds or exact solutions with certificates of optimality, achieving 100×+ speedup over exact baselines

Linear Shortest Path Index on Multi-Attribute Networks | *C++, Boost, Git, CGAL* — June 2021 – June 2023

- Built a partition-based index combining tree decomposition and convex hull computation to answer preference-weighted shortest path queries on multi-criteria road networks in real time
- Designed a dimension-reducing point-location mapping and A* search with precomputed heuristics, achieving 25× speedup over Dijkstra with 23 ms query time on million-vertex 3D graphs
- Optimized construction via convex hull merge and cross-partition parallelization; evaluated on 5 real US road networks (up to 1.2M vertices, 2–5 cost dimensions)

Adaptive Rate Limiting Engine in Go | *Go, Git* — May 2022 – June 2022

- Implemented token bucket, leaky bucket, and sliding window algorithms behind a unified Limiter interface, enabling runtime strategy switching via the strategy pattern

Awards

National Scholarship | *China* Oct. 2020
National Scholarship | *China* Oct. 2022
'Internet+' Tianjin Competition Area Silver Award | *Tianjin, China* May. 2023
Outstanding Graduate of Tianjin University | *Tianjin University* Jun. 2023
HKU Postgraduate Scholarship | *Hong Kong SAR, China* 2023 – 2027

Technical Skills

Languages: C/C++, Python, Java, Go, SQL (Postgres), Bash
Developer Tools: CMake, Git, Docker, VS Code, Visual Studio, PyCharm, IntelliJ
Libraries: STL, Boost, Eigen, pandas, NumPy, Matplotlib, Pytorch

Teaching & Service

Reviewer / Program Committee 2026
Academic Conferences

- The Web Conference (WWW 2027)
- ACM International Conference on Web Search and Data Mining (WSDM 2027)

Teaching Assistant 2023 – 2025
The University of Hong Kong

- COMP7106 Big Data Management (Section 2C), 2023
- COMP7107 Management of Complex Data Types (Section 2B), 2024
- COMP3323 Advanced Database Systems (Section 2A), 2025

Volunteer 2025
IEEE International Conference on Data Engineering (ICDE 2025)