

# Xiangju Zhu

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## EDUCATION

**The University of Hong Kong**  
*Ph.D. Candidate in Computer Science*

Hong Kong SAR, China  
*Dec. 2023 – Present*

**Tianjin University**  
*B.Eng in Computer Science | CGPA: 92/100*

Tianjin, China  
*Sep. 2019 – Jun. 2023*

## AWARDS

<b>National Scholarship</b>   <i>China</i>	Oct. 2020
<b>National Scholarship</b>   <i>China</i>	Oct. 2022
<b>‘Internet+’ Tianjin Competition Area Silver Award</b>   <i>Tianjin, China</i>	May. 2023
<b>Outstanding Graduate of Tianjin University</b>   <i>Tianjin University</i>	Jun. 2023
<b>HKU Postgraduate Scholarship</b>   <i>Hong Kong SAR, China</i>	2023 – 2027

## 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 (PACMOD)*, 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** | *C++, Boost, STL, Python, Git* 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** | *C++, Boost, STL, Python, Git* 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<sup>7</sup> 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++, CMake, 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

TECHNICAL SKILLS

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**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

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<b>Teaching Assistant</b>	2023 – 2025
<i>The University of Hong Kong</i>	
<ul style="list-style-type: none"><li>• COMP7106 Big Data Management (Section 2C), 2023</li><li>• COMP7107 Management of Complex Data Types (Section 2B), 2024</li><li>• COMP3323 Advanced Database Systems (Section 2A), 2025</li></ul>	
<b>Volunteer</b>	2025
<i>IEEE International Conference on Data Engineering (ICDE 2025)</i>	