

Research Focus: Resource-aware data systems for approximate nearest neighbor querying, graph data analytics, and agentic decision-making (LLM and RL agents) under model and data constraints.

Education

School of Computing and Data Science, HKU

Hong Kong SAR

3rd-year Ph.D. Candidate in Computer Science

2023 - 2027 (expected)

- Advisor: Prof. Reynold Cheng
- Visiting at LIG - Université Grenoble Alpes

School of Computing and Data Science, HKU

Hong Kong SAR

B.Sc. in Mathematics and Decision Analytics

2018 - 2022

- 1st Class Honor

Publications

[6] Orchestrating Pre-Trained Agents for Multi-Objective Decision Making

Carrie Wang, Reynold Cheng, Behrooz Omidvar Tehrani, Sihem Amer-Yahia.

Under Revision at ICML 2026.

- Studied multi-objective sequential decision making under inference-time resource constraints.
- Proposed a zero-shot policy orchestration framework that reuses pre-trained single-objective agents, avoiding costly retraining for multi-objective reinforcement learning.

[5] On Efficient Approximate Aggregate Nearest Neighbor Queries over Learned Representations

Carrie Wang, Sihem Amer-Yahia, Laks V.S. Lakshmanan, Reynold Cheng.

SIGMOD 2026.

- Introduced Aggregation Queries over Predicted Nearest Neighbors (AQNNs), a new query abstraction that performs aggregation over model-predicted neighborhoods.
- Investigated AQNNs under proxy-oracle model discrepancy, where embeddings are generated by models of varying fidelity.
- Designed SPRinT, a sampling-based framework with precision-recall guarantees, and developed algorithms for value- and count-based aggregation queries.

[4] A Sampling-Based Framework for Hypothesis Testing on Large Attributed Graphs.

Carrie Wang, Chrysanthi Kosyfaki, Sihem Amer-Yahia, Reynold Cheng.

VLDB 2024.

- Formulated hypothesis testing on attributed graphs as instance-level query processing.
- Categorized graph hypotheses into node-, edge-, and path-based types to enable expressive statistical queries over graph structures.

- Developed a sampling-based framework with statistical guarantees and proposed PHASE, a path-hypothesis-aware sampler optimized for efficiency via non-backtracking random walks.

[3] **HINCare: An Intelligent Helper Recommender System for Elderly Care.**

Carrie Wang, Wentao Ning, Xiaoman Wu, Reynold Cheng.

WWW 2024.

[2] **Algorithms for Enabling and Verifying Upskilling**

Sihem Amer-Yahia, Reynold Cheng, Nassim Bouarour, Carrie Wang.

CITERS 2023

[1] **Using a Novel Clustered 3D-CNN Model for Improving Crop Future Price Prediction.**

Liege Cheung, Carrie Wang, Adela SM Lau, Rogers MC Chan.

Knowledge-Based Systems 2023.

Internships

Research Intern at Theory Lab (2012 Lab)

Hong Kong SAR

Huawei Hong Kong Research Center (HKRC) | Supervisor: Dr. Chumin Sun, Dr. Cheng Cao 2025.06

- 2025.10

- Proposed a spoof fingerprint detection method based on Conditional DDPMs, reducing cross-material spoof acceptance rates by up to 3% at 99.9% true acceptance rate; patent pending.
- Developed a next-app prediction model using Bayesian networks and enhanced AppUsage2Vec to capture user behavior patterns.

Research Assistant at HKU SAAS Data Science Lab

Hong Kong SAR

HKU | Supervisor: Dr. Adela S.M. Lau

2022.08 - 2023.03

- Explored multimodal perception for nonverbal communication by integrating audio-visual signals for emotion recognition.
- Built and deployed a prototype system to support real-time and offline emotion analysis.

Research Intern at Institute for Mathematical Sciences

Singapore

National University of Singapore (NUS) | Supervisor: Dr. Wenjie Zhang

2022.06 - 2022.07

- Investigated representation learning for temporal graphs, focusing on edge-centric modeling under evolving relational structures.

Awards and Scholarships

- Silver Medal in 51st International Exhibition of Inventions Geneva 2026
- HKU Postgraduate Scholarships 2023 - 2027
- First Class Honors 2023
- Inno Show Award at the 7th Engineering Inno Show 2023
- Dean's Honors List 2019 & 2022
- Yu Kam Tim Chan Siu Hing Award in AI and DS 2020 - 2021
- HKU Foundation Entrance Scholarship 2018 - 2022

Skills

Languages: English (Professional), Cantonese (Intermediate), Mandarin (Native).

Programming: Python, C++, R, MATLAB.

Certificate: Teaching and Learning in Higher Education.

Teaching

- Introduction to Database Management Systems (TA) Fall 2024
- Big Data Management (TA) Spring 2024
- Probability and Statistics (TA) Fall 2020