

A third-year PhD student at the School of Computing and Data Science, the University of Hong Kong (HKU-CDS), specializing in **graph analytics** and **approximate query answering**, with SIGMOD, VLDB, and WWW publications on **scalable** and **algorithmic** solutions for attributed graph pattern mining and nearest-neighbor queries. Strong **Python/PyTorch** skills and a solid **mathematics/statistics** background.

## Education

School of Computing and Data Science, HKU

Hong Kong SAR

*Ph.D. in Computer Science*

2023 - 2027 (*expected*)

- Advisor: Prof. Reynold Cheng
- Visiting at LIG - Université Grenoble Alpes (2024.05 - 2024.06)

School of Computing and Data Science, HKU

Hong Kong SAR

*B.Sc. in Mathematics and Decision Analytics*

2018 - 2022

- 1st Class Honor

## Publications

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

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

*Under Revision at ICLR 2026.*

- Proposed a zero-shot policy orchestration framework based on LLMs to support multi-objective sequential decision making.

### [4] On Aggregation Queries over Predicted Nearest Neighbors.

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

*SIGMOD 2026.*

- Introduced Aggregation Queries over Nearest Neighbors (AQNNs), a novel type of aggregation queries over the predicted neighborhood of a designated object.
- Designed a framework, Sampler with Precision-Recall in Target (SPRinT), to support the answering of AQNNs and two algorithms, SPRinT-V and SPRinT-C, for value- and count-based aggregation functions.

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

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

*VLDB 2024.*

- Categorized hypotheses on attributed graphs into node, edge, and path types.
- Developed a sampling-based hypothesis testing framework to enable hypothesis testing on attributed graphs.

- Proposed a Path-Hypothesis-Aware Sampler called PHASE and its optimized version PHASE<sub>opt</sub> with a non-backtracking mechanism and fixed number of neighbors during random walks.

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

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

WWW 2024.

- Compared the applicability and effectiveness of graph recommendation algorithms in matching helpers with elder adults.
- Won the the Inno Show Award at the 7th Engineering Inno Show.

[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.

## Projects

**An Emotional AI Chatbot Using an Ontology and a Novel Audiovisual Emotion Transformer for Improving Nonverbal Communication.** 2022.08 - 2023.02

HKU SAAS Data Science Lab

Supervisor: Dr. Adela Lau

- Extracted facial features using OpenFace and 22 audio features from time and frequency domains as model inputs.
- Designed a transformer-based lightweight audio-visual emotion detection model and experimented on three public video emotion datasets, RAVDESS, RML, and SAVEE, to validate our model's performance.
- Deployed the model as a real-time/upload video emotion detection website using Flask.

**TCGConv - Edge Representation Learning in Temporal Graph.**

2022.05 - 2022.07

NUS Institute for Mathematical Sciences

Supervisor: Dr. Zhang Wenjie

- Designed a Temporal Conjugate Graph Convolution (TCGConv) framework for edge representation learning in heterogeneous temporal graphs using conjugate graph transformation and LSTM aggregators in message passing.
- Constructed the model and baselines using PyTorch and Geometrics.
- Ran extensive experiments on two public datasets, MOOC and Credit Card datasets.

## Internships

**Research Intern at Theory Lab (2012 Lab) | Huawei Hong Kong Research Center (HKRC)** Hong Kong SAR, 2025.06 - 2025.10

- Developed a next-app prediction model using Bayesian networks and enhanced AppUsage2Vec to capture user behavior patterns.
- 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**.

**Tech Consultant Intern | KPMG China**

Hong Kong SAR, 2021.01 - 2021.08

- Studied Robotic Processing Automation (RPA) in two weeks and applied it to migrate 4000+ legacy data with 98% success rate for a luxury company.
- Assist in the design phase of an internal web & mobile app implementation using PowerApps for a leading insurance company.
- Configured and tested system functionalities, assisted in User Acceptance Testing (UAT) by preparing how-to documents and training materials.

## Awards

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|---|-------------|
| • HKU Postgraduate Scholarships               | 2023 - 2027 |
| • First Class Honors                          | 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, Cantonese (Intermediate), Mandarin (Native).

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

**Certificate:** Teaching and Learning in Higher Education.

## Teaching

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