# Chengyi LIU

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🐙 GitHub Profile

🌐 Google Scholar

## RESEARCH INTEREST

My current research focuses on the development of **Generative Recommender Systems**, with an emphasis on modeling user behavior patterns through probabilistic generative processes. Specifically, I investigate the application of **Diffusion Models** to address various recommendation tasks, aiming to enhance both the expressiveness and effectiveness of recommendation algorithms.

## EDUCATION

- **The Hong Kong Polytechnic University** *Jan. 2023 - Now*
  *Ph.D. candidate in Computer Science* Advisor: Chair Professor Qing Li, Professor Wenqi Fan

- **University College London** *Sept. 2021 - Dec. 2022*
  *Master of Science* MSc Health Data Science

- **University of Nottingham** *Sept. 2017 - Jun.2021*
  *Bachelor of Science* BSc Computer Science with Artificial Intelligence

## SELECTED PROJECTS

- **Continuous-time Discrete-space Diffusion Model for Recommendation** *WSDM 2026*
  *Chengyi Liu, Xiao Chen, Shijie Wang, Wenqi Fan, Qing Li*

  – In this project, we present CDRec, a discrete diffusion framework designed for recommendation tasks. CDRec introduces a popularity-aware noise schedule that produces semantically coherent diffusion trajectories, enabling more informative perturbations of user–item interactions. To further enhance efficiency and personalization, we develop a unified training framework that integrates consistency parameterization for fast sampling with a contrastive learning objective guided by multi-hop collaborative signals. Together, these components allow CDRec to capture fine-grained user preferences while achieving efficient and effective recommendation performance.

- **Score-based Generative Diffusion Models for Social Recommendations** *TKDE 2025*
  *Chengyi Liu, Jiahao Zhang, Shijie Wang, Wenqi Fan, Qing Li*

  – In this project, we developed the Score-based Generative Model for Social Recommendation (SGSR), which effectively adapts Stochastic Differential Equation (SDE)-based diffusion models to address the challenge of low social homophily. We proposed efficient training objectives and a tailored optimization strategy to enable effective diffusion-based modeling in the context of social recommendation, achieving SOTA performance across multiple benchmarks.
  – *Citations:* **22**

- **Generative Diffusion Models on Graphs: Methods and Applications** *IJCAI 2023*
  *Chengyi Liu, Wenqi Fan, Yunqing Liu, Jiatong Li, Hang Li, Hui Liu, Jiliang Tang, Qing Li*

  – In this project, we conducted a comprehensive review of representative algorithms across three key variants of graph diffusion models: Score Matching with Langevin Dynamics (SMLD), Denoising Diffusion Probabilistic Models (DDPM), and Score-based Generative Models (SGM). We further summarized the major applications of generative diffusion models on graphs, with a particular focus on molecular and protein modeling.
  – *Citations:* **110**

- **Graph Defense Diffusion Model** *KDD 2026*
  *Xin He, Wenqi Fan, Yili Wang, Chengyi Liu, Rui Miao, Xin Juan, Xin Wang*

  – In this project, we propose the Graph Defense Diffusion Model (GDDM), a flexible purification framework that leverages the denoising and generative capabilities of diffusion models. By iteratively injecting and removing noise, GDDM effectively mitigates adversarial perturbations, restoring the original structure and feature of attacked graphs.
  – *Citations:* **1**

## ACADEMICAL SERVICES

**Conference Reviewer:** KDD'25, WWW'23

**Journal Reviewer:** TNNLS, TKDD, TAI

**Workshop Service:** Web chair for DExLLM workshop at ICDE'25

## Awards

- **KDD Excellent Reviewer** *2025*
- **Bachelor of Science with Honours in the First Class at UNNC** *2021*
- **The Head's scholarship at UNNC** *2020*
- **The Excellent Freshmen Scholarship at UNNC** *2017*

## Teaching Experience

**The Hong Kong Polytechnic University**

- Teaching Assistant, Database Systems *Fall'2025*
- Teaching Assistant, Legal Aspects and Ethics of Computing *Spring'2025*
- Teaching Assistant, Database Systems *Fall'2024*
- Teaching Assistant, Data Structures and Database Systems *Spring'2024*
- Teaching Assistant, Data Structures *Fall'2023*

## Volunteer Experiences

- **Footprint IHF Project**
  Served as a support teacher of Bali IHF project.
  Tough basic content such as English, music, and art to children aged 6-18. *2017*