Yuanzhen Xie

FlyingFeather | xieyzh3@gmail.com | +(86)13719324629

Education

2019 - 2021 [Computer Science] Master's Degree at **Sun Yat-sen University** (GPA: 4.0/4.0)
2015 - 2019 [Software Engineering] Bachelor's Degree at **Sun Yat-sen University** (GPA: 3.8/4.0, Rank: 7/119)
2016.7 - 8 Visiting Student at **University of Miami** in USA

Research Interests

My recent research has been dedicated to exploring various applications of artificial intelligence, including but not limited to Code Intelligence, LLM Agent, and Graph Neural Network. Below are the specific directions and details of my research endeavors:

- **Code Intelligence**: Code intelligence is one of the core methods to achieve intelligent understanding and processing of various tasks by computers. It can bridge the gap between natural language and computational language, changing the way humans interact with computers. In the long term, it can support the realization of fields such as embodied Intelligence and intelligent robots.
- **LLM Agent**: The emergence of big models has revitalized many fields and Agents have become the key to AGI. Designing Agents empowered by anthropomorphic thinking to solve real-life practical scenario problems provides the brain for the research of next-generation intelligent robots.
- **Graph Neural Network**: GNN is a kind of neural network that computes and propagates directly on graphs, and can effectively deal with the characteristics of graph data, including the structural information of graphs and the node information of graphs. My research in the field of Graph Neural Networks (GNN) primarily focuses on two areas: **Recommendation Systems based on GNN** and Dynamic GNN.

Research Experience

Friend Recommendation Based on GNNs, Sun Yat-Sen University December 2018 - June 2019
Heterogeneous Dynamic Graph, Sun Yat-Sen University June 2019 - February 2020
CDR[1] **based on Extended Relationships**, SYSU and Intern in Tencent August 2020 - February 2021
User Embedding Learning and Transfering for CDR, Tencent September 2021 - March 2022
Heterogeneous Graph Contrastive Learning for CDR, Tencent November 2022 - March 2023
Graph Collaborative Filtering, Tencent October 2022 - October 2023
General LLM Agent, Tencent March 2023 - May 2023
Text-to-SQL base on LLM Agent, Tencent October 2023 - February 2024
Text-to-SQL based on Model Collaboration, Tencent May 2024 - present

Publications

Published

[WSDM oral] Yuanzhen Xie, Zijing Ou, et al. (2021). "Learning and updating node embedding on dynamic heterogeneous in-formation network". In: *Proceedings of the 14th ACM International Conference on Web Search and Data Mining (WSDM, CCF-B, **THU CCF-A**)*, pp.184-192.

[1] CDR stands for Cross-Domain Recommendation

[CIKM] Xu. Kun*, **Yuanzhen Xie***[2], et al. (2021). "Expanding relationship for cross domain recommendation". In: *Proceedings of the 30th ACM International Conference on Information & Knowledge Management (CIKM, **CCF-B**)*, pp.2251-2260.

[WSDM oral] Chenglin Li, **Yuanzhen Xie**, et al. (2023). "One for all, all for one: Learning and transferring user embeddings for cross-domain recommendation". In: *Proceedings of the Sixteenth ACM International Conference on Web Search and Data Mining (WSDM, CCF-B, **THU CCF-A**)*, pp.366-374.

[ICDM oral] Jin Xinzhou, Jintang Li, **Yuanzhen Xie**, et al. (2023). "Enhancing Graph Collaborative Filtering via Neighborhood Structure Embedding". In: *2023 IEEE International Conference on Data Mining (ICDM, **CCF-B**)*, pp.190-199.

[KBS] Yuanzhen Xie, Chenyun Yu, et al. (2024). "Heterogeneous graph contrastive learning for cold start cross-domain recommendation". In: *Knowledge-Based Systems (KBS, **JCR-1**), IF: 7*, p.112054.

[ACL Findings] Yuanzhen Xie, Chenyun Yu, et al. (2024). "Decomposition for Enhancing Attention: Improving LLM-based Text-to-SQL through Workflow Paradigm". In: ACL *(**ACL Findings**)*.

Preprints

[arXiv] Yuanzhen Xie, Tao Xie, et al, "Olagpt: Empowering llms with human-like problem-solving abilities," *arXiv:2405.08013*, 2024.

[arXiv] Chenglin Li, **Yuanzhen Xie**, et al, "CTRL: Continuous-Time Representation Learning on Temporal Heterogeneous Information Network," *arXiv:2405.08013*, 2024.

[arXiv] Xinzhou Jin, Jintang Li, Liang Chen, Chenyun Yu, **Yuanzhen Xie**, et al, "L^2CL: Embarrassingly Simple Layer-to-Layer Contrastive Learning for Graph Collaborative Filtering," *arXiv:2407.14266*, 2024.

Awards, Fellowships, & Grants

2022-2024	**Outstanding Contributor(<=10%, three times)**,	*First-Honor*
2021	**Good+ Contributor**,	*Second-Honor*
2021	**Tencent Sustainable Social Value Award**,	*First-Honor*
2021	**Outstanding Graduates(<=5%)**,	*First-Honor*
2020-2021	**The First-Class Scholarship for Excellent Student(<=5%)**,	*First-Honor*
2019-2020	**The Second-Class Scholarship for Excellent Student**,	*Second-Honor*
2020	**Huawei Scholarship(<=5%)**,	*First-Honor*
2019	**Outstanding Graduates(<=5%)**,	*First Prize*
2015-2019	**The School-level Merit Scholarship And National Inspirational Scholarship For Several Years In A Row**,	*First Prize*
2018	**Meritorious Winner In Mathematical Contest In Modeling**,	*Third Prize*
2017	**University Students' Entrepreneurship Training Practice Program Wins Provincial Excellence**,	*Provincial Prize*
2016	**Silver Prize Of Guangdong Universities Mobile Internet Application Development Creativity Competition**,	*Provincial Prize*

Skills

English Level: CET-6 (500+, preparing for IELTS), able to easily read English literature and proficient in English writing.

Programming Skills: python/C/C++/spark/Pytorch/SQL

Basic Algorithm: common machine learning algorithms and deep learning algorithms such as logistic regression, support vector machines, neural networks, LSTM, attention, Word2vec, GCN, Graphsage, etc.

Research: graph neural networks, heterogeneous graph recommendation, cross-network, LLM Agent, LLM fine-tuning, etc.

[2] * for equal contribution

Projects

Intelligent Data Analysis Assistant(LLM Agent, Text-to-SQL, Fine-tuning)

Language interactive data analysis assistant product, including checking indicators, finding tables, generating SQL, interpreting data, table understanding, dialogue system, and intelligent Q&A functions.

1) **Intelligent Agent Architecture Construction: From Theory to the Ground**: Based on the human cognitive architecture, OlaGPT is proposed to simulate the human cognitive pattern, which improves the reasoning ability by up to **85 percent**(https://mp.weixin.qq.com/s/pb8aIkda9IMAKeE36qgpEQ). Extending the entire Agent architecture to data analytics, the overall accuracy is 70%+.
2) **Text2SQL-agent construction**: The workflow paradigm based on the decomposition-promoting attention concept effectively improves the text2SQL task based on LLM. On the engineering side, the use of information recall ranking, understanding optimization, RAG, SQL generation, and SQL correction helps to increase the landing perception rate **from 24% to over 85%**. On the research side, compared with Spider Dev, Spider-Realistic, and Bird datasets, it has increased by about 2-3 percentage points. The related paper was published in **2024-ACL-Findings**.
3) **Text2SQL-agent construction based on model collaboration**: By adopting a collaborative approach with various models, an accuracy rate of up to 65.58% (**top 2**) has been achieved on brid-dev. Currently, the results are being organized and submitted for ranking.
4) **Establishing SQL-related application ecosystem**: Building agent functions such as SQL error correction, SQL optimization, SQL rewriting, SQL Q&A, SQL explanation, SQL dialect transformation, etc., with a high perceptual rate of 85%+.
5) **Designing an intelligent data construction process for the text2SQL domain**: involving data construction, enhancement, and data validation. It is currently under construction and is expected to produce benchmark papers.

Work Experience

Senior Algorithm Researcher, Tencent July 2021 - present

1) **Union Feature**: As the main person in charge of this project, the objective is to break data silos and provide ID mapping, ID relationships (device replacement recognition, natural person, social relationships), and IP ecosystem services (IP insights, audience selection, etc.) for businesses. The specific achievements of the project are as follows:
   a) Achieved significant results in more than **15 specific projects** in commercialization, recommendation, growth, and security scenarios.
   b) Won the BG CVP Commercialization Breakthrough Award and the Department Team Incentive Award for the project, and received the Technical Improvement and Technical Benchmark awards.
   c) Responsible for promoting research-related cooperation and **having published two papers**.
2) **Data Analysis Assistant**: As the sub-project leader for the algorithm core, I led the core Agent construction and text2SQL research, successfully bringing them to fruition. Currently, the product is used in Ola-Data Insight SQL, Datatalk, Excelin, and the overall application is used about 5,000 times per week on average. Specifically, I completed the following work:
   a) Led the development of **task routing, dialogue system, text2SQL, data plotting, table data understanding**, task evaluation, and intelligent document Q&A functions.
   b) Received incentive awards, and the CVP Technical Innovation Award for the product.
   c) **Led three work-related papers as first author**, (one published in ACL, one expected to be submitted to SIGMOD, and one released (OlaGPT) to trigger range discussions at home and abroad) and **participated in three other research projects**.

Intern, Tencent May 2020 - October 2020

1) **User Profile Mining**: Mined fundamental profiles (gender and age) based on Deep Neural Networks algorithm for the development of the portrait platform. As a result, the accuracy of gender identification improved by 6 percentage points, while age identification accuracy increased by 8 percentage points.
2) **Cross-domain Recommendations**: Researched cross-domain recommendations based on graphs, integrating data and models to provide services for downstream business parties.