Ruiyu Li

albertalee0116@gmail.com | Alberta-Lee

EDUCATION

- **Xidian University** *Sept. 2022 - Jun. 2025*
  Master of Computer Science and Technology Xi'an, China
  ◦ GPA: 3.80/4.00

- **Xihua University** *Sept. 2017 - Jun. 2021*
  Bachelor of Energy and Power Engineering Chengdu, China
  ◦ GPA: 3.42/5.00

WORK EXPERIENCE

- **Tencent PCG [🌐]** *Jul. 2025 – Present*
  Applied Research Beijing, China
  ◦ **Feature and Data Foundation (q/d/q-d)**: Built a scalable and standardized feature-and-sample foundation for the emoji search stack across the query/document/query-document (q/d/q-d) sides. Starting from upstream ds/de raw logs, I designed and productionized unified behavior wide tables and feature tables, establishing an end-to-end pipeline from raw events to training-ready samples. I also introduced distribution-aware fine-grained bucketing for key continuous features, which significantly mitigated long-tail effects and reduced metric volatility, providing a stable, high-quality data backbone for iterative reranking and consumption-oriented model improvements.
  ◦ **Consumption Reranking Model System and Iteration**: Delivered a full lifecycle ranking system for emoji search CTR prediction, including algorithm design, engineering integration, data/feature onboarding, training, offline evaluation, online A/B testing, GSB validation, and end-to-end rollout. The new consumption ranking pipeline achieved a ≥ 0.012 offline AUC gain over the baseline, and delivered statistically significant online impact with over 3% relative lift in CTR, leading to a measurable improvement in overall search CTR.
  ◦ **q–d Behavioral Statistical Feature System**: Implemented a robust q–d behavioral statistical feature framework over multiple time windows (e.g., $1/7/30$ days) using query–emoji interaction logs, covering exposures, views, clicks, and other behaviors. I built the end-to-end workflow from log collection to offline aggregation, feature materialization, and stable online serving into the consumption ranker. This feature set improved relevance and result quality in GSB evaluations, and produced statistically significant online gains, including $\geq 0.6\%$ lift in exposure UV and $\geq 0.4\%$ lift in UTR, alongside improvements in other key business metrics.
  ◦ **Generative Sug Exploration (OneSug) and Closed-Loop MVP**: Led the exploration and delivery of a OneSug-based generative suggestion (Sug) solution, building a closed-loop system from data cleaning and representation learning to semantic ID construction and preference alignment. I cleaned and normalized prefix–query data from online exposure/click logs, and created a high-quality prefix2query dataset for enhanced embedding training, validated via visualization and similarity-based inspection. To enable controllable generation, I generated and iteratively refined semantic IDs using RQ-VAE and RK-Means, and established evaluation metrics such as coverage, collision rate, and cluster compactness. On top of semantic IDs, I trained a generative Sug model (Qwen-series) and performed preference alignment using click-based positive/negative signals, forming a complete loop of "semantic ID $\rightarrow$ generation $\rightarrow$ evaluation $\rightarrow$ optimization," with offline validation completed to support subsequent online experimentation.

INTERNSHIPS

- **Tencent PCG [🌐]** *May 2024 – Sept. 2024*
  Applied Research Intern Beijing, China
  ◦ Enhanced QQ Channel Search feature engineering and training samples: mined query- and document-side statistics from click/exposure logs, built an offline feature store, and analyzed feature coverage; delivered a 0.73% lift in channel click UTR and a 0.78% lift in channel join-request UV.
  ◦ Improved the channel search ranking model by strengthening generalization and enabling multi-task adaptation of cross features; upgraded the architecture from DCN to DCN+PLE, resulting in a 3.53% lift in channel click UTR and a 3.47% lift in channel join-request UV.
  ◦ Addressed loss-scale mismatch between the *click* and *join* tasks in multi-task training by integrating GradNorm into the DCN+PLE framework, yielding a 7-point AUC gain at the 0.1% (thousandth-percentile) slice.

PUBLICATIONS

C=CONFERENCE, J=JOURNAL, S=IN SUBMISSION

[C.1] **Ruiyu Li**, Peige Zhao, Guangxia Li, Pengcheng Wu, Xingyu Gao, Zhiqiang Xu. (2026). **Sharpness-aware Federated Graph Learning**. In *Proceedings of the 19th ACM International Conference on Web Search and Data Mining*

TL; DR: We propose a novel federated graph learning algorithm, SEAL, specifically designed to effectively address the challenge of graph data heterogeneity. We aim to improve the generalization ability of as many local GNN models as possible during training from two different perspectives. On the one hand, we incorporate a sharpness-aware minimization optimizer into each local GNN, which jointly minimizes the local loss and its sharpness so as to search for model parameters in a flat region of the loss landscape with uniformly low loss values. On the other hand, we decorrelate local graph representations to mitigate the dimensional collapse observed across clients, thereby preserving richer and more discriminative features for downstream classification tasks. Extensive experiments on a wide range of graph classification benchmarks demonstrate that SEAL consistently outperforms state-of-the-art federated graph classification methods and exhibits better generalization under diverse and heterogeneous graph data distribution settings.

[C.2] Yik Chun Ho, Ming Li, Zhaowei Xu, **Ruiyu Li**, WONG Lik Hang Kenny, Wong Shing Yin, KinHei Lee. (2025). **Cross-Modal Knowledge Distillation: A Survey**. In *42nd International Conference on Machine Learning* Workshop NewInML

TL; DR: We explore the theoretical foundations, key mechanisms, and practical applications of cross-modal knowledge distillation (CMKD), highlighting its ability to integrate diverse modalities for enhanced representation learning and innovation across fields such as video/audio processing, autonomous driving, humancentered computing, medical analysis, and vision-language models. Key techniques such as feature alignment, contrastive learning, GANs, and knowledge imputation, along with robust loss functions and feature decomposition strategies, demonstrate the versatility and effectiveness of CMKD.

[J.1] **Ruiyu Li**, Peilin Zhao, Guangxia Li, Zhiqiang Xu, Xuewei Li. (2024). **Online Parallel Multi-task Relationship Learning via Alternating Direction Method of Multipliers**. *Neurocomputing*

TL; DR: We proposed a novel framework for online multi-task learning based on the alternating direction multiplier method, which is suitable for distributed computing environments. This framework dynamically models task relationships to adapt to constant changes in streaming data, outperforming traditional gradient-descent-based methods in accuracy and efficiency, especially in decentralized settings.

[C.3] **Ruiyu Li**, Guangxia Li, Xiao Lu, Jichao Liu, Yan Jin. (2024). **A Context Augmented Multi-Play Multi-Armed Bandit Algorithm for Fast Channel Allocation in Opportunistic Spectrum Access**. In *29th IEEE Symposium on Computers and Communications (ISCC)*

TL; DR: We addressed the practical challenges of channel allocation in opportunity spectrum access scenarios by modeling channel noise as a perturbation in the restless contextual multi-play multi-armed bandit problem. By incorporating channel state information as context, we derive two index policies that effectively learn the correlations between context and perturbation, leading to lower regret and a more reasonable selection of sub-optimal arms.

[C.4] Guangxia Li, Cheng Zhou, **Ruiyu Li**, Jia Liu. (2022). **Heat Load Forecasting for District Water-heating System Using Locality-enhanced Transformer Encoder**. In *The Thirteenth ACM International Conference on Future Energy Systems*

TL; DR: We introduced a Transformer-based heat load forecasting method for district heating systems in this study, addressing the limitations of traditional time-series prediction approaches. By enhancing local context information, our method achieves higher accuracy than classic RNN models, enabling swift and precise adaptation to short-term heat load fluctuations.

HONORS AND AWARDS

- **National Scholarship** *2024*
  Ministry of Education, PRC
- **The First Prize Scholarship in Xidian University** *2023*
  Xidian University
- **Outstanding Undergraduate Graduates of Sichuan Province** *2021*
  Sichuan Provincial Department of Education
- **National Encouragement Scholarship** *2018, 2019, 2020*
  Sichuan Provincial Department of Education