


Lei Chen

◇ Email: lchen@cs.hku.hk or lei.chen@siat.ac.cn

◇ Tel: (+852) 97053915 or (+86) 13430470235

◇  <https://scholar.google.com/citations?user=H25qJSMAAAAJ>



EDUCATION

The University of Hong Kong (HKU)

Sep. 2022 -

Ph.D. in Computer Science

Institution: Department of Computer Science, Faculty of Engineering

Supervisor: Prof. Ruibang Luo · Research Focus: Bioinformatics

University of Chinese Academy of Sciences (UCAS)

Sep. 2019 - Jun. 2022

Postgraduate Recommendation

M.Eng. in Computer Technology

GPA: 3.89/4.0 · Rank: Top 5%

TOEFL: 90

Affiliation: Shenzhen Institute of Advanced Technology, CAS · Supervisor: Prof. Min Yang

Natural Language Processing, Recommender Systems, Bioinformatics, etc.

China University of Mining and Technology (CUMT)

Sep. 2015 - Jun. 2019

B.Eng. in Computer Science and Technology

GPA: 4.22/5.0 · Rank: Top 5%

CET-4: 594 · CET-6: 560

EXPERIENCE

WXG, Tencent

Jun. 2021 - Jun. 2022

2021 Tencent Rhino-Bird Research Elite Training Program · Breakthrough Progress Award

Advisor: Dr. Jingtao Ding · Focus on Item-Provider Co-learning for Sequential Recommendation.

Representation Learning Lab, Westlake University

Apr. 2021 - Aug. 2021

Research Intern · Advisor: Prof. Fajie Yuan

Focus on Protein Representation Learning.

Shenzhen Institute of Advanced Technology, CAS

Sep. 2018 - Aug. 2019

Research Intern · Advisor: Prof. Min Yang

Focus on Natural Language Processing, Recommender Systems.

PUBLICATIONS

- **Lei Chen**, Fajie Yuan, Jiayi Yang, Xiang Ao, Chengming Li, Min Yang. A User-Adaptive Layer Selection Framework for Very Deep Sequential Recommender Models. (AAAI-2021, CCF A).
- **Lei Chen**, Fajie Yuan, Jiayi Yang, Xiangnan He, Chengming Li, Min Yang. User-specific Adaptive Fine-tuning for Cross-domain Recommendations. (TKDE, CCF A).
- **Lei Chen**, Jingtao Ding, Min Yang, Chengming Li, Chonggang Song, Lingling Yi. Item-Provider Co-learning for Sequential Recommendation. (SIGIR-2022, CCF A).
- Guanghu Yuan, Fajie Yuan, Beibei Kong, **Lei Chen**, Min Yang, Chenyun YU, Bo Hu, Zang Li. Tenrec: A Large-scale Multipurpose Benchmark Dataset for Recommender Systems. (NeurIPS-2022, CCF A).
- Qingnan Jiang, **Lei Chen**, Ruifeng Xu, Xiang Ao, Min Yang. A challenge dataset and effective models for aspect-based sentiment analysis. (EMNLP-2019, CCF B).
- Min Yang, **Lei Chen**, Xiaojun Chen, Qingyao Wu, Wei Zhou, Ying Shen. Knowledge-enhanced Hierarchical Attention for Community Question Answering with Multi-task and Adaptive Learning. (IJCAI-2019, CCF A).

- **Lei Chen**, Ruifeng Xu, Min Yang. Overview of the NLPCC 2020 Shared Task: Multi-Aspect-Based Multi-Sentiment Analysis (MAMS). (NLPCC-2020, CCF C).
- Qingnan Jiang, **Lei Chen**, Wei Zhao, Min Yang. Towards Aspect-Level Sentiment Modification Without Parallel Data. (IEEE Intelligent Systems, JCR Q2).
- Min Yang, **Lei Chen**, Ziyu Lyu, Junhao Liu, Ying Shen, Qingyao Wu. Hierarchical fusion of common sense knowledge and classifier decisions for answer selection in community question answering. (Neural Networks, JCR Q1).
- Min Yang, Wei Zhao, **Lei Chen**, Qiang Qu, Zhou Zhao, Ying Shen. Investigating the transferring capability of capsule networks for text classification. (Neural Networks, JCR Q1).
- Min Yang, Junhao Liu, **Lei Chen**, Zhou Zhao, Xiaojun Chen, Ying Shen. An advanced deep generative framework for temporal link prediction in dynamic networks. (IEEE Transactions on Cybernetics, JCR Q1).
- **Lei Chen**, Fajie Yuan, Jiayi Yang, Min Yang, Chengming Li, Jingtao Ding. Scene-adaptive Knowledge Distillation for Sequential Recommendation via Differentiable Architecture Search. (arXiv).

PATENTS

- **Lei Chen**, Min Yang, Fajie Yuan, Chengming Li, Qingshan Jiang. Implementation method, device and equipment of adaptive protein prediction framework. (China Patent, NO.: CN202110600871.7).
- **Lei Chen**, Min Yang, Fajie Yuan, Chengming Li, Qingshan Jiang. A knowledge distillation method for sequential recommendation based on Earth Mover's Distance. (China Patent, NO.: CN202011245696.6).
- **Lei Chen**, Min Yang, Fajie Yuan, Chengming Li, Qingshan Jiang. A method for constructing sequential recommendation model and sequential recommendation method. (China Patent, NO.: CN202010844315.X).
- **Lei Chen**, Min Yang, Fajie Yuan, Chengming Li, Qingshan Jiang. A sequential recommendation method and system based on adaptive network depth. (China Patent, NO.: CN202010835626.X).
- **Lei Chen**, Min Yang, Fajie Yuan, Chengming Li, Qingshan Jiang. An adaptive output sequential recommendation method and system. (China Patent, NO.: CN202010830579.X).
- **Lei Chen**, Min Yang, Fajie Yuan, Chengming Li, Qingshan Jiang. A sequential recommendation method and system based on improved ResNet structure. (China Patent, NO.: CN202010816525.8).
- **Lei Chen**, Min Yang, Fajie Yuan, Ziyu Lyu, Chengming Li. A cross-domain sequential recommendation method based on adaptive fine-tuning strategy. (China Patent, NO.: CN201911272877.5).
- Min Yang, Qiang Qu, **Lei Chen**, Qingshan Jiang. An aspect-level sentiment modification method based on multi-task learning. (China Patent, NO.: CN201910299536.0).
- Min Yang, Wei Bi, Xiaojiang Liu, **Lei Chen**, Tingting Huang. Model training method, dialogue generation method, device, equipment and medium. (China Patent, NO.: CN201910470526.9).
- Min Yang, Wei Bi, Xiaojiang Liu, **Lei Chen**, Tingting Huang. Model training method, dialogue generation method, device, equipment and storage medium. (PCT International Patent, NO.: PCT/CN2020/092701).

RESEARCH PROJECTS

Multi-Objective Optimization for Recommender Systems

Jun. 2021 - Jun. 2022

2021 Tencent Rhino-Bird Research Elite Training Program, WXG, Tencent

- *Item-Provider Co-learning for Sequential Recommendation*

Focus on Item-Provider Co-learning for Sequential Recommendation, especially for the specific industry scenario of WeChat Channels.

- IPSRec: A novel Item-Provider Co-learning framework for Sequential Recommendation. Specifically, two representation learning methods (single-stream and cross-stream) are proposed to learn comprehensive item and user representations based on the user's historical item sequence and provider sequence. Then, contrastive learning is employed to further enhance the user embeddings in a self-supervised manner, which treats the representations of a specific user learned from the item side as well as the item-provider side as the positive pair and treats the representations of different users in the batch as the negative samples.

Protein Representation Learning

Apr. 2021 - Aug. 2021

Research project at Representation Learning Lab, Westlake University

Focus on Protein Representation Learning, especially for learning better protein representation pre-training and fine-tuning paradigms.

- A Unified Contrastive Learning Framework for Protein Representation Learning: Enhancing protein representation learning with the help of contrastive learning. The existing large-scale protein pre-training language models all use Masked Language Model (MLM) objective for self-supervised learning. We argue that MLM objective can learn token-level representation of the proteins well, but is lacking in learning the sequence-level representation. Contrastive learning aims to learn effective representation by pulling semantically close neighbors together and pushing apart non-neighbors, and can well enhance the protein representation learning.
- A Task-adaptive Knowledge Distillation Framework for Protein Representation Learning via Neural Architecture Search: With the help of knowledge distillation and neural architecture search, we can search for customized and adaptive model structures for different protein downstream tasks to achieve the best trade-off between effectiveness and efficiency. Knowledge distillation can be used to perform model compression and the student model structure is not manually specified, which can be automatically searched through the neural architecture search instead.
- Protein-adaptive Fine-tuning: Realizing protein-adaptive fine-tuning in protein downstream tasks, and customizing personalized fine-tuning strategies for different proteins. When solving protein downstream tasks, the existing methods are to fine-tune all parameters with a pre-trained model. We argue that fine-tuning all parameters may be sub-optimal, and every protein should have its own fine-tuning policies for better protein representation transfer learning.

Recommender Systems Based on User-specific Adaptive Strategies Sep. 2019 - Mar. 2021

Research project at Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences

- *A User-Adaptive Layer Selection Framework for Very Deep Sequential Recommender Models*
- *User-specific Adaptive Fine-tuning for Cross-domain Recommendations*
- *Scene-adaptive Knowledge Distillation for Sequential Recommendation via Differentiable Architecture Search*

Focus on Recommender Systems Based on User-specific Adaptive Strategies.

- A User-adaptive Layer Selection Framework for Very Deep Sequential Recommender Models (SkipRec): The high network latency has become the main obstacle when deploying very deep recommender models into a production environment. We argue that the typical prediction framework that treats all users equally during the inference phase is inefficient in running time, as well as sub-optimal in accuracy. To resolve such an issue, we present SkipRec, an adaptive inference framework by learning to skip inactive hidden layers on a per-user basis. Specifically, we devise a policy network to automatically determine which layers should be retained and which layers are allowed to be skipped, so as to achieve user-specific decisions.
- User-specific Adaptive Fine-tuning for Cross-domain Recommendations (UAF): Current methods are mainly based on the global fine-tuning strategy: the decision of which layers of the pre-trained model to freeze or fine-tune is taken for all users in the target domain. We argue that users in RS are personalized and should have their own fine-tuning policies for better preference transfer learning. As such, we propose a novel User-specific Adaptive Fine-tuning method (UAF), selecting which layers of the pre-trained network to fine-tune, on a per user basis. Specifically, we devise a policy network with three alternative strategies to automatically decide which layers to be fine-tuned and which layers to have their parameters frozen for each user.
- Scene-adaptive Knowledge Distillation for Sequential Recommendation via Differentiable Architecture Search (AdaRec): Compressing the heavy recommendation models into middle- or light-weight neural networks is of great importance for practical production systems. To realize such a goal, we propose AdaRec, a knowledge distillation (KD) framework which compresses knowledge of a teacher model into a student model adaptively according to its recommendation scene by using differentiable neural architecture search (NAS). Specifically, we introduce a target-oriented distillation loss to guide the structure search process for finding the student network architecture, and a cost-sensitive loss as constraints for model size, which achieves a superior trade-off between

recommendation effectiveness and efficiency.

Natural Language Processing

Sep. 2018 - Aug. 2020

Research project at Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences

- *A challenge dataset and effective models for aspect-based sentiment analysis*
- *Overview of the NLPCC 2020 Shared Task: Multi-Aspect-Based Multi-Sentiment Analysis (MAMS)*
- *Toward Aspect-Level Sentiment Modification Without Parallel Data*
- *Knowledge-enhanced Hierarchical Attention for Community Question Answering with Multi-task and Adaptive Learning*

Focus on Natural Language Processing, especially in Aspect-level Sentiment Analysis and Modification, Question Answering and Dialogue Generation.

- **Multi-Aspect-based Multi-Sentiment Analysis:** In existing ABSA datasets, most sentences contain only one aspect or multiple aspects with the same sentiment polarity, which makes ABSA task degenerate to sentence-level sentiment analysis. We present a new large-scale Multi-Aspect Multi-Sentiment (MAMS) dataset, in which each sentence contains at least two different aspects with different sentiment polarities. We propose simple yet effective CapsNet and CapsNet-BERT models to tackle the MAMS task. In addition, we hold the NLPCC-2020 shared task on Multi-Aspect-based Multi-Sentiment Analysis (MAMS) with our annotated MAMS dataset. The MAMS task has attracted 50 teams to participate in the competition and received a good response.
- **Aspect-level Sentiment Modification:** we propose a joint aspect-level sentiment modification (JASM) model. JASM is a multi-task system, which jointly trains two coupled modules: aspect-specific sentiment words extraction and aspect-level sentiment transformation. Besides, we propose a novel memory mechanism to learn aspect-aware sentiment representation and a gating mechanism to dynamically select aspect-aware sentiment or content information for generating the next words.
- **Community Question Answering:** We propose a Knowledge-enhanced Hierarchical Attention for community question answering with Multi-task learning and Adaptive learning (KHAMA). First, we propose a hierarchical attention network to fully fuse knowledge from input documents and knowledge base (KB) by exploiting the semantic compositionality of the input sequences. In addition, we build multiple CQA models with adaptive boosting and then combine these models to learn a more effective and robust CQA system. Furthermore, KHAMA is a multi-task learning model. It regards CQA as the primary task and question categorization as the auxiliary task, aiming at learning a category-aware document encoder and enhance the quality of identifying essential information from long questions.

HONORS/AWARDS

Breakthrough Progress Award, Tencent	2022
Dean Scholarship-Special Award	2022
Dean Scholarship-Excellent Award	2021
Pacemaker to Merit Student	2022
Merit Student	2021
Outstanding Graduate Thesis	2022
National Scholarship	2016
National Scholarship for Encouragement	2018
The Zeng Xianzi Scholarship	2016, 2017, 2018
The Sun Yueqi Excellent Student Award	2017
The First Prize Scholarship	2017
Outstanding Graduates	2019

SERVICES

Reviewer NeurIPS 2022, AAI 2022, EMNLP 2022, COLING 2022, ACL 2021, EMNLP 2021, COLING 2020, Neurocomputing, Knowledge-based Systems

Organizer NLPCC-2020 Shared Task: Multi-Aspect-based Multi-Sentiment Analysis (MAMS)

Volunteer AAI-2021 Student Volunteer Program