YISONG MIAO

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Natural Language Processing, Information Retrieval, Conversational Recommender Systems

Updated Feb 2021

EDUCATION

National University of Singapore (School of Computing) Singapore

Ph.D. Student in Computer Science Jan 2021 - Now

- Work in progress.

Dissertation-Based Master of Computer Science (GPA: 4.25/5) Aug 2018 – 2020

- Dissertation titled: Advanced Method Towards Conversational Recommendation. Accepted to NUS Library at June 2020. [PDF] [Defense Slides]

Undergraduate Exchange Student (GPA: 4.2/5) Jan 2017 – May 2017

University of Chinese Academy of Sciences (UCAS) Beijing, China

Founding Class of Bachelor of Science in Computer Science (GPA: 3.5/4) Sept 2014 – June 2018

- UCAS is a new school and ranks 1st in China by NTU Ranking and ESI Ranking, it is set out to cultivate the next generation of great scientists of China and offers the most difficult courses in China.

PUBLICATIONS

[1] *Estimation-Action-Reflection: Towards Deep Interaction Between Conversational and Recommender Systems*

Wenqiang Lei, Xiangnan He, **Yisong Miao**, Qingyun Wu, Richang Hong, Min-Yen Kan & Tat-Seng Chua

Presented at ACM Conference on Web Search and Data Mining as Full Research Paper (WSDM 2020)

- This work is my first research experience as a main author. I was closely advised by Dr. Lei, Dr. He, Dr. Kan and Dr. Chua. I have submitted my m
- aster thesis based on this work.
- Together with my collaborators, I introduce a novel conversational recommender system, EAR, which is able to recommend item to user through conversation. EAR emphasizes on the strategy of the conversation, which is solved by Reinforcement Learning. We also innovate classic Factorization Machine model to achieve both item prediction and attribute prediction through multi-task learning framework.
- My contributions in this work include the whole research pipeline: idea innovation, literature review, model design, system implementation, experiments and evaluation, paper writing.
- Project website with [Code and Datasets] [PDF] [Slides] [Posters]

[2] *Interactive Path Reasoning on Graph for Conversational Recommendation*

Wenqiang Lei, Gangyi Zhang, Xiangnan He, **Yisong Miao**, Xiang Wang, Liang Chen & Tat-Seng Chua

Accepted to at ACM SIGKDD Conference 2020 as Full Research Paper (KDD 2020)

- This work is a side-project of mine. After EAR System [1] is accepted by WSDM, our team is doing a follow-up work based on [1] on the topic of conversational recommendation.
- My contributions are (1) I give advice to experiment design; (2) give technical instructions on experimental details; (3) write the experiment section of the paper and revised the whole paper.
- Generally speaking, in this work, we improve conversational recommendation systems by knowledge graph. Specifically, we augment the EAR system with item-attribute graph. By exploiting the graph constraints, we have made the conversation strategy more effective and more explainable. [PDF]

[3] *Towards Computing Contextual Lexical Contrast: Cont2Lex Corpus, Recognition benchmarks, and Preliminary Analyses*

Wenqiang Lei*, **Yisong Miao***, Runpeng Xie, Bonnie Webber, Meichun Liu, Tat-Seng Chua, Nancy Chen

Status: Full Research Paper. Ready for submission to AAAI 2021, * equal contribution

- In this work, I gain more independent research training under the guidance of Dr. Lei, Dr. Kan and Dr. Chua.
- I systematically investigate a fundamental NLP phenomenon: the lexical relation of words is dependent on the context where they are shown. We pay special attention to lexical contrast, which is always under investigated. We first built a large and high-quality corpus to benchmark this task. Later we scrutinise the performance of state-of-the-art contextual word embeddings like BERT and ELMo, pointing directions for the development of contextual word embeddings.

- My contribution in this work is also the whole research pipeline. My progress compared with [1] is that I gain more independent research skills.
- Paper and Codes will be released when officially published. Slides are already available at [Slides].

Academic Activity

- Oral presentation at ACM Web Search and Data Mining Conference — Houston, USA, Feb. 2020
- Attend ACL 2020 as a volunteer. — Virtual Conference, July, 2020
- Reviewer / Secondary Reviewer:
  - NLPCC 2019, Nominated by Prof Min-Yen Kan, I evaluated 2 full research papers in NLP.
  - AAAI 2020, Nominated by Dr. Wenqiang Lei, I evaluated 1 full research paper in NLP.
- I maintained a few reading lists related to my research to flourish the community:
  - Reading List on Conversational Recommendation [Link]
  - Reading List on Discourse [Link]
  - Reading List on Text Representation [Link]

Patent in Submission

An Advanced Conversational Recommender System Emphasising on the Interaction Between Conversational Components and Recommender Components, SG Non-Provisional Application No. 10202000482X
Wenqiang Lei, Xiangnan He, **Yisong Miao,** Min-Yen Kan & Tat-Seng Chua

Research Proposal Writing

Research on Conversational Recommendation, No. 61972372, National Natural Science Foundation of China

- I contributed significantly to the writing of the proposal with Prof Xiangnan He from USTC based on our WSDM paper on conversational recommendation. My writing includes motivation, the significance of the research and proposed methods.
- Result: Successfully granted with 600K RMB.

Past Experiences

University of Chinese Academy of Science, National University of Singapore — Beijing, Singapore
Bachelor Thesis, jointly advised by Prof Min-Yen Kan, and Prof Yanyan Lan — Jan 2018 - May 2018
Webpage Classification and Metadata Extraction using URL only, the motivation of such project is: traditional webpage classification methods require fetching full webpage, which can be quite time-consuming.

- Designed and implemented a deep learning workflow for char-level and word-level LSTM model, the latter one has achieved the strongest performance so far.

Special Interest Group in Math/Interdisciplinary Modeling at UCAS — Beijing, China
Founder, Head of the Group — Feb 2015 - Sept 2015

- Founded the Special Interest Group in Math/Interdisciplinary Modeling in my university(UCAS). The group grew from 0 to 50+ members during my service.
- My responsibilities included: Organizing Seminars, Inviting Lectures, Giving Tutorials.

University Student Union at UCAS — Beijing, China
Deputy Director of Social Practice Department — Sept 2014 – August 2015

- Led the department to hold Thanksgiving Day series activities(for 200) and Music Band Festival(for 300).

Selected Awards

First Runner-up in Kaggle Competition of News Article Classification. [Code][Leaderboard] — NUS, 2018
Meritorious Winners in the Interdisciplinary Contest in Modeling — Beijing, China, Jan 2016

- Designed and created a System-Dynamics model to predict the future water shortage based on real-world data in multiple areas as the leader of team.

Second Prize of National Olympiad in Physics Competition (50 / ~5000) — China, 2013

Additional Information

- Programming Languages: python, c/c++, java, sql
- Natural Language: Mandarin Chinese(Native), TOEFL-ibt: 99. GRE: Quantitive: 169 and Verbal: 149 (**I only spent 2 days** to prepare GRE due to a paper submission deadline)
- Tools and Frameworks: PyTorch, Stanford CoreNLP, spaCy, scikit-learn, numpy, scipy, postgresql
- Interests: 10th Grade in Erhu (A Traditional Chinese Musical Instrument), swimming, running