YISONG MIAO

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Natural Language Processing, Information Retrieval, Conversational Recommender Systems

EDUCATION

National University of Singapore (School of Computing) — Singapore
Master of Computer Science (GPA: 4.3/5) — Aug 2018 – Now
Undergraduate Exchange Student (GPA: 4.2/5) — Jan 2017 – May 2017

University of Chinese Academy of Sciences — Beijing, China
Founding Class of Bachelor of Science in Computer Science (GPA: 3.5/4) — Sept 2014 – June 2018

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
Status: 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 master thesis with 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: https://ear-conv-rec.github.io/

[2] *Interactive Path Reasoning on Graph for Conversational Recommendation*
Wenqiang Lei, Gangyi Zhang, Xiangnan He, **Yisong Miao**, Xiang Wang, Liang Chen & Tat-Seng Chua
Status: 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) wrote 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.

ONGOING RESEARCH

[1] *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.

[2] *Simplifying Implicit Discourse Relation Recognition*
Wenqiang Lei*, **Yisong Miao***, Bonnie Webber, Tat-Seng Chua, Nancy Chen (*author list may change later*)
Status: Full Research Paper. In preparation 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.

- The motivation for me to start this project is from the conversation log in our EAR System, I am driven to know what is the intrinsic logic between two utterances, and my mentors gave me a pointer as *"implicit discourse relation"* in NLP society.
- I am motivated by the fact that implicit discourse relation recognition is one of the most challenging NLP tasks. I strive to simplify the long and redundant text into shorter form where the discourse signals is highlighted.
- Current status: my simplification framework is being evaluated by our collaborator, Prof. Bonnie Webber from Edinburgh University, who is the main author of PDTB (primary corpus of discourse.)

Academic Activity

- Oral presentation at ACM Web Search and Data Mining Conference Houston, USA, Feb. 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.

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

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), English(Fluent, TOEFL-ibt 99), Spanish(Beginner)
- Tools and Frameworks: PyTorch, Stanford CoreNLP, spaCy, scikit-learn, numpy, scipy, postgresql
- Interests: 10th Grade in Erhu (A Traditional Chinese Musical Instrument), swimming, running

Referees

You may kindly contact these mentors of mine for their evaluation on my academic performance and research potential:
Dr. Wenqiang Lei: wenqianglei@gmail.com;
Dr. Xiangnan He: xiangnanhe@gmail.com;
Dr. Min-Yen Kan: kanmy@comp.nus.edu.sg;
Dr. Tat-Seng Chua: chuats@comp.nus.edu.sg