Qiannan Zhu

Ph.D. student in Data Mining

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Education

Sep 2015 - Aug 2020 **Ph.D. student**, *Institute of Information Engineering*, Chinese Academy of Sciences, Beijing.
Major: Data Mining. Advisor: Prof. Jianlong Tan and Associate Prof. Xiaofei Zhou.

Sep 2011 - Jun 2015 **Undergraduate**, *Computer and Information Engineering College*, Henan University, Henan.
Major: Software Engineering. Ranking of Academic Achievement (1/354).

Research Interests

My research interests mainly lie in **Recommendation System**, but also other data mining domains including knowledge graph and question answering. Indeed, my works focus on knowledge-aware recommendation system, knowledge representation learning & reasoning and Multilingual Knowledge Alignment.

- **Knowledge-aware Recommendation**: Design knowledge-aware and user behavior driven algorithms for explainable recommendation, by incorporating attentional entity-neighborhood integrator based on the user-item knowledge graphs.
- **News Recommendation**: Design deep attentional neural network for news recommendation, which infuses the content and structural fact knowledge of news to learn news' representation.
- **Knowledge Representation**: Design efficient representations of entities and relations, scoring functions and scoring-limited loss function to construct more powerful embeddings of knowledge graphs.
- **Knowledge Reasoning**: Design reasoning networks for complex reasoning in knowledge graphs, by making use of convolutional neural network, recurrent neural network, multi-head attention mechanism.
- **Multilingual Knowledge Alignment**: Design neighborhood-aware attentional alignment network for multilingual knowledge graph, using advanced embedding learning techniques for monolingual knowledge graphs and alignment rules for aligning multilingual knowledge graphs.

Publications

- A Knowledge-Aware Reasoning Network for Recommendation.
  Qiannan Zhu, Xiaofei Zhou, Jia Wu, Jianlong Tan, Li Guo.
  The 34th AAAI Conference on Artificial Intelligence (**AAAI 2020**).
- Knowledge Base Reasoning with Convolutional-based Recurrent Neural Networks.
  Qiannan Zhu, Xiaofei Zhou, Jianlong Tan, Li Guo.
  IEEE Transactions on Knowledge and Data Engineering (**TKDE 2019**).
- DAN:Deep Attention Neural Network for News Recommendation.
  Qiannan Zhu, Xiaofei Zhou, Zeliang Song, Jianlong Tan, Li Guo.
  The 33th AAAI Conference on Artificial Intelligence (**AAAI 2019**).
- Neighborhood-Aware Attentional Representation for Multilingual Knowledge Graphs.
  Qiannan Zhu, Xiaofei Zhou, Jia Wu, Jianlong Tan, Li Guo.
  The 28th International Joint Conference on Artificial Intelligence (**IJCAI 2019**).

- Learning Knowledge Embeddings by Combining Limit-based Scoring Loss.
  Xiaofei Zhou, **Qiannan Zhu**, Ping Liu, Li Guo.
  The International Conference on Information and Knowledge Management (**CIKM 2017**).

Work Experience

Sep. 2019 - Present **Senior Algorithm Engineer**, *Youku Congnitive and Intelligent Lab, Alibaba Group*, China.

Respond for the explainable video recommendation

- Construct the knowledge graph about 15 million users and 70 thousand videos.
- Define the meta-path to extract the reasoning path between users and videos.
- Design and apply the explainable recommendation algorithm on the Youku platform.

Engineering Experience

Apr. 2017 - Sep. 2020 **User Behaviors Prediction System Based on User Knowledge Graph**, *The Ministry of Science and Technology*, China.

User Behaviors Prediction Algorithm

- Design and construct the user behaviors knowledge graph from user behaviors records.
- Design and implement the user behaviors prediction algorithm on Tensorflow platform.
- Apply user behaviors prediction algorithms to several large-scale real-world tasks.
- Improve efficiency and scalability of both algorithms and applications.

Jue. 2019 - May. 2020 **Knowledge-Aware Explainable Recommendation System**, *Institute of Information Engineering, Chinese Academy of Sciences*, China.

An Explainable Reasoning Algorithm for Recommendation

- Construct the user-item knowledge graph from user purchase records.
- Design the explainable reasoning recommendation system based on the user-item knowledge graph and user history data.
- Implement the explainable reasoning neural network on Tensorlfow platform.
- Apply the recommendation system to several large-scale real-world datasets.

Three Referees

- Jianlong Tan, Institute of Information Engineering, Chinese Academy of Sciences, tanjianlong@iie.ac.cn
- Xiaofei Zhou, Institute of Information Engineering, Chinese Academy of Sciences, zhouxiaofei@iie.ac.cn
- Yanan Cao, Institute of Information Engineering, Chinese Academy of Sciences, caoyanan@iie.ac.cn

Expertise

- **Major Courses**: Data Mining, Pattern Recognition, Natural Language Processing, etc.
- **Programming Languages**: Python, Matlab, C/C++, Java, LaTeX.
- **Development Environments**: Tensorflow, Pytorch, sklearn, Pandas, Linux.

Honors and Awards

- **CAS Presidential Scholarship** (Top 1%), Chinese Academy of Sciences (CAS), 2019.
- **Zhu Li Yuehua Outstanding Doctoral Scholarship** (Top 1% Ph.D. student), Chinese Academy of Sciences (CAS), 2019.
- **IIE Presidential Scholarship** (Top 10%), Institute of Information Engineering, CAS, 2018 & 2017.
- **Merit Student**, University of Chinese Academy of Sciences (UCAS), 2018&2017.
- **Laboratory Excellent Student Scholarship**, Institute of Information Engineering, CAS, 2018 & 2017.