Chenhan Yuan

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EDUCATION

PH.D. in ***Computer Science*** 09.2021-12.2024(expected)
The University of Manchester
Supervisor: Professor Sophia Ananiadou and Professor Junichi Tsujii

M.S. in ***Computer Science*** 2019-2021
Virginia Polytechnic Institute and State University (Virginia Tech)
GPA: 4.0/4.0; Advisor: Professor Hoda Eldardiry

B.S. in ***Electronic Information Science and Technology*** 2015-2019
University of Electronic Science and Technology of China
GPA: 3.9/4.0

RESEARCH INTEREST

Broad Areas: Artificial Intelligence, Natural Language Processing, Machine Learning, Knowledge Graph, and Information Retrieval.
Specific Areas: Large Language Model Finetuning and Benchmarking, Temporal Reasoning, Knowledge Graph Reasoning
Applications: Finance, Biology and Medicine, NLP, etc

PROJECTS

Temporal Reasoning in Large Language Models, The University of Manchester 10.2022-present

- Propose the first explainable temporal reasoning and future event forecasting dataset by a novel knowledge-graph-instructed-generation approach and **instruction-finetune LLMs**.
- Investigate LLM's zero-shot ability on temporal relation extraction through prompt design and discuss its limitations in keeping inference consistency and long-dependency reasoning.

Temporal Relation Extraction and Reasoning, The University of Manchester 05.2022-present

- Propose a contrastive prototypical learning framework with a sampling memory queue to improve the imbalanced temporal relation extraction performance of LM-based models.
- Propose a gradient-based approach to enable interpretability for RGCN-based temporal knowledge graph reasoning models by efficiently tracking node importance across timesteps.

N-ary Document-Level Relation Extraction, Virginia Tech 07.2019-10.2022
(Partially funded by National Science Foundation (NSF) via NSF EAGER No.2107008)

- Propose and implement two unsupervised binary relation extraction models based on **Variational Autoencoder** and Seq2Seq structure.
- Propose and implement a supervised n-ary document-level relation extraction model based on **reinforcement learning** and **contrastive learning**.

Leveraging GANs for Personalized and Efficient Text Generation, UESTC 10.2018-10.2019

- Proposed a two-level GAN model for efficient text generation based on user-defined topics/sentiment.
- Proposed a GAN-based method to generate sentences matching an author's style by using their function/content words as inputs and constraints.

SELECTED PUBLICATIONS

Conference

(1) **Chenhan Yuan**, Qianqian Xie, and Sophia Ananiadou. "Zero-shot Temporal Relation Extraction with ChatGPT" *2023 Workshop on Biomedical Natural Language Processing and BioNLP Shared Tasks (BioNLP in ACL2023)* pdf
(2) **Chenhan Yuan**, Ryan Rossi, Andrew Katz and Hoda Eldardiry. "Clustering-based Unsupervised Generative Relation Extraction" *2022 IEEE International Conference on Big Data (Big Data).* pdf
(3) **Chenhan Yuan**, and Hoda Eldardiry. "Unsupervised Relation Extraction: A Variational Autoencoder Approach" *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing. (EMNLP oral)* 2021. pdf;code
(4) **Chenhan Yuan**, and Yi-chin Huang. Personalized sentence generation using generative adversarial networks with author-specific word usage. In *20th International Conference on Computational Linguistics and Intelligent Text Processing (CICLing 2019)* pdf;code

Preprint

(1) **Chenhan Yuan**, Qianqian Xie, Jimin Huang, and Sophia Ananiadou. "Back to the Future: Towards Explainable Temporal Reasoning with Large Language Models" 2023 pdf;code
(2) **Chenhan Yuan**, Qianqian Xie, and Sophia Ananiadou. "Temporal Relation Extraction with Contrastive Prototypical Sampling" 2023 pdf
(3) **Chenhan Yuan**, and Hoda Eldardiry. "GradXKG: A Universal Explain-per-use Temporal Knowledge Graph Explainer" 2023 pdf
(4) **Chenhan Yuan**, Ryan Rossi, Andrew Katz and Hoda Eldardiry. "A Reinforcement Learning Framework for N-ary Document-Level Relation Extraction" 2023 pdf

SKILLS

Large language model: RLHF(PPO)/DPO/Supervised Finetuning; Self-instructed dataset construction
Programming language & Framework: Python; Pytorch; Tensorflow; Linux; Git; C; JAVA, etc

ACADEMIC SERVICE

Journal and Conference Reviewer: Information Sciences, Information Processing & Management, PAKDD 2023, IJCNN 2023, IEEE BIBM 2023, ACL 2023

HONORS

The University of Manchester
Kilburn Computer Science Department Scholarship 2021
University of Electronic Science and Technology of China
Outstanding graduate student award (**summa cum laude**) 2019
Scholarship for exchange student (**2 recipients** in the year in the department) 2018
Top-class Award of People's Scholarship in China (**rate: 1%**) 2017