

Kefei Duan

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RESEARCH INTERESTS

Natural Language Processing/Understanding and its application, Reinforcement Learning, Robotics

EDUCATION

Washington University in St. Louis, MO, USA

Aug. 2023 - Present

Major in Computer Science

Peking University, Beijing, China

Sep. 2019 - Jul. 2023

Bachelor of Science in Intelligence Science and Technology

GPA: 3.741/4.0 (Rank: 10/81)

Advised by Prof. Ming Zhang

PUBLICATIONS

Zejun Liu, **Kefei Duan**, Junwei Yang, Hanwen Xu, Ming Zhang, Sheng Wang. MetaFill: Text Infilling for Meta-Path Generation on Heterogeneous Information Networks. EMNLP 2022.

EXPERIENCE

Research Assistant

Aug. 2021 - Jun. 2022

Paul G. Allen School of Computer Science & Engineering, University of Washington, Seattle

- * I work on this project under the supervision of Zejun Liu, a Ph.D. student at Peking University. The project is advised by Prof. Sheng Wang at University of Washington and Prof. Ming Zhang at Peking University.
- * Key Idea: Formulate meta-path identification problem as a word sequence infilling problem, which can be advanced by Pretrained Language Models.
- * Main Contributions: In this project, I do some preliminary research to find potential direction, help initiate the idea, conduct some pre-experiments to test our idea, implement all the baselines to compare with our method, conduct experiments on baselines to see their performance, and process some data for our use.
- * Title: *MetaFill: Text Infilling for Meta-Path Generation on Heterogeneous Information Networks*
- * Accepted to EMNLP 2022

Research Intern

Nov. 2021 - Nov. 2022

Montreal Institute for Learning Algorithms (MILA), University of Montreal

- * I work on this project under the supervision of Meng Qu, a Ph.D. student at Quebec Artificial Intelligence Institute. This project is advised by Prof. Jian Tang at Quebec Artificial Intelligence Institute and Prof. Ming Zhang at Peking University.
- * Key Idea: To link entities in sentence to entities in Knowledge Graph and utilize the structured information, i.e. relational paths, in KG to facilitate Relation Extraction.
- * Main Contributions: I lead the project to do some preliminary research to figure out whether our idea has been proposed and implemented before, initiate the idea and implement our algorithm, implement all the baselines to compare with our method, do experiments to evaluate the effectiveness of our model and write the paper for the submission purpose.
- * Title: *Relation Extraction via Joint Reasoning with Texts and Knowledge Graphs*
- * Rejected by EMNLP 2022.

Research Intern

Jul. 2022 - Sep. 2022 / Feb. 2023 - Jun. 2023

Paul G. Allen School of Computer Science & Engineering, University of Washington, Seattle

- * I work on this project under the supervision of Prof. Sheng Wang at University of Washington.
- * In this work, we mainly want to focus on Biomedical Document-level Relation Extraction, using external knowledge base to facilitate relation extraction, especially for those distantly entity pairs.
- * This project was my thesis topic. And we submitted it to EMNLP 2023 (although being rejected).
- * For now, we want to submit it to Journal of Biomedical Informatics.

Research Intern

May. 2021 - Jul. 2023

Dlib, Peking University, Beijing, China

- * Attend weekly group meetings.
- * Advised by Prof. Ming Zhang and PhD candidate Zequn Liu.
- * Work with other students on some projects.

Teaching Assistant

Sep. 2022 - Dec. 2022

Peking University, Beijing, China

- * Teaching Assistant of course *Introduction to Computation (C)*.
- * Work with Prof. Liyan Qian and other three Teaching Assistants.
- * Help students with homework and course problems, and make them more familiar with Python.

AWARDS

China Merchants Securities Scholarship (Beijing, Peking University)	Sep. 2022
Merit Student Award (Beijing, Peking University)	Sep. 2022
National Inspirational Scholarship (Beijing, Peking University)	Oct. 2022
National Scholarship	Sep. 2021
* Highest scholarship awarded by the Chinese government, <0.1%	
Merit Student Award (Beijing, Peking University)	Sep. 2021
Third Class Scholarship (Beijing, Peking University)	Sep. 2020
Merit Student Award (Beijing, Peking University)	Sep. 2020

COURSEWORK PROJECTS

Artificial Intelligence for Drug	Mar. 2022 - Jun. 2022
Project for course <i>Technology Innovation and Entrepreneurship</i> . Aim to use artificial intelligence to facilitate the production of drug-relief medicine. My main role in this project is to lead the group and use some existing algorithms to predict the drug activities.	
Single Image Reflection Removal	Mar. 2022 - Jun. 2022
Project for course <i>Computational Photography: Image Formation Theory and Deep Learning Practice</i> . Work on my own and aim to remove the reflection in a image.	
Analysis of the Author of The Story of the Stone	Mar. 2022 - Jun. 2022
Project for course <i>Thinking in programming</i> . Work in a group of two and aim to use some machine learning technics to analyze whether the first 80 chapters and the last 40 chapters of Dream of the Red Chamber were written by the same person.	
Robot Design	Dec. 2021 - Jan. 2022
Project for course <i>Introduction to Intelligent Robots</i> . Work in a group of four and aim to design a robot in Webots to tidy up the room.	
Bitcoin Crime Visualization	Dec. 2021 - Jan. 2022
Project for course <i>Introduction to Visualization and Visual Computing</i> . Work in a group of four and aim to visualize the famous scam to find out where the bitcoins go.	
Detection of Train Tickets	Dec. 2021 - Jan. 2022
Project for course <i>Digital Image Processing</i> . Work independently and aim to find the area of train tickets in a image and detect the numbers on the tickets.	
Machine Learning Translation	Mar. 2021 - Jun. 2021
Project for course <i>Learning Data Science with Python</i> . Work in a group of two and aim to translate English corpus into Chinese.	
Body Posture Detection	Mar. 2021 - Jun. 2021
Project for course <i>Machine Learning</i> . Work in a group of five and aim to detect the posture of one person and give it to another person.	

Medical Concept Generation

Mar. 2021 - Jun. 2021

Project for course *Algorithm Design and Analysis*. Work in a group of two and aim to generate the concept description for given medical terms.

Design of Mahjong Bot

Mar. 2020 - Jun. 2020

Project for course *Practice of Programming in C/C++*. Work in a group of three and aim to design a Bot to play Mahjong.

Design of Tour Guide Robot

Mar. 2020 - Jun. 2020

Project for course *Introduction to Artificial Intelligence*. Work in a group of four and aim to design a tour guide robot in Webots.

Game of the Amazons

Nov. 2019 - Jan. 2020

Project for course *Introduction to Computation (A)*. Work independently and aim to implement algorithms to let computer play Game of the Amazons with people.

TECHNICAL SKILLS

Programming Languages: Python, C/C++, Matlab

Softwares/Platforms/Libraries: PyTorch

Research Tools: LaTeX