Jiaxin Zhang

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Summary

I obtained my PhD in Computer Science at the University of Strathclyde. I have strong foundation in NLP and deep learning principles including Large Language Models, and 5 years experience in Python and relevant frameworks such as PyTorch and Hugging Face. Prior to my PhD, I accumulated two years of professional experience as a Natural Language Processing Engineer. My commitment to AI research is driven by a philosophy of "Making the World a Better Place", which inspires my active involvement in public service and community assistance across both academic and non-academic spheres. Outside of my academic and professional pursuits, I am passionate about running, reflecting my belief in the power of good habits to foster personal and professional growth.

Skills

Programming Languages: Python, HTML, CSS, SQL
Deep Learning Framework: Pytorch, Transformers, Accelerator, scikit-learn, pytorch-lightning
Analysis and Visualization: numpy, pandas, matplotlib, TikZ
Tools: git, bash, vim, LaTeX
Languages: Chinese (native), English (proficient)

Education

University of Strathclyde **Oct 2020 – June 2024**
PhD in Computer and Information Sciences *Glasgow, UK*

- Thesis: Advancing Mathematical Reasoning with Deep Learning: From Numerical Insights to Geometrical Understanding
- Scholarship: Fully funded by "Strathclyde Centre for Doctoral Training (SCDT) Research Studentship"
- Research Interests: automated mathematical reasoning by deep-learning models, automated reasoning by LLMs

University of Sheffield **Seq 2017 – Oct 2018**
MSc in Advanced Computer Science *Sheffield, UK*

- Key Courses: Object Oriented Programming and Software Design, Text Processing, Machine Learning and Adaptive, Intelligence, Natural Language Processing, Data Science with Python

Chang'an University **Seq 2011 – Jul 2015**
BSc in Network Engineering, Computer Science *Xi'an, China*

- Chang'an University is part of the Double First Class University Plan and Project 211 of China

Publications

Please also check my Google Scholar page. The first author is highlighted by *.

Accepted Papers

1. Jiaxin Zhang*, Zhongzhi Li*, Mingliang Zhang, Fei Yin, Chenglin Liu, Yashar Moshfeghi. **GeoEval: Benchmark for Evaluating LLMs and Multi-Modal Models on Geometry Problem-Solving**. Accepted in the ACL 2024 Findings.
2. Jiaxin Zhang*, Yashar Moshfeghi. **GOLD: Geometry Problem Solver with Natural Language Description**. Accepted in the NAACL 2024 Findings.
3. Jiaxin Zhang*, Yashar Moshfeghi. **ELASTIC: Numerical Reasoning with Adaptive Symbolic Compiler**. Accepted for Advances in Neural Information Processing Systems 35 (NeurIPS 2022).
4. Jiaxin Zhang. **A Combination of Lexicon-Based and Classified-Based methods for Sentiment Classification based on Bert**. Accepted in Journal of Physics: Conference Series (2021).

Under Reviewed Papers

1. Jiaxin Zhang*, Yinghui Jiang, Yashar Moshfeghi. **GAPS: Geometry-Aware Problem Solver**. Under reviewed in Artificial Intelligence Journal.

Work Experience

University of Strathclyde, UK | *TA of CS 985 Machine Learning for Data Analytics* **Feb 2022 – Apr 2024**

- Guided students in applying deep learning methods learned in class and directed the Teaching Assistant team in evaluating exams and assignments for the Machine Learning for Data Analytics course.

TCL Technology, China | *NLP Researcher* **May 2019 – Sep 2020**

- Collected a substantial dataset, comprising 60,000 conversational pairs and 1 million data points, for training the ChatBot. Developed and implemented a Python-based pipeline for the efficient cleaning and processing of data.
- Used TensorFlow to develop a ChatBot utilizing the advanced NLP technologies of Seq2Seq architecture with VAE.
- Designed a retrieval system of on the pre-trained BERT model, enhancing the ChatBot to select the relevant responses.
- Proposed Bucket-Search algorithm to optimize the response retrieval efficiency, reducing the response time within 20ms.
- Developed a Poetry matching system utilizing the BK-tree, enabling fast matching of user inputs less than two words.
- Built statistical language model to evaluate the ChatBot's responses.

Ping An of China, China | *NLP Engineer Intern* **Mar 2019 – Apr 2019**

- Collaborated with a team to establish guidelines and built an automatic pipeline to automate the approval process of insurance provisions utilizing advanced NLP and deep learning technologies.
- Implemented tools for extensive text processing tasks such as extracting vital information from the raw text.

Bayes Data Intelligence Technology Service, China | *NLP Engineer* **Oct 2018 – Dec 2018**

- Used scikit-learn library to build a classification model in logistic classification algorithm to categorize the objectives of various stores within a designated business district based on an analysis of structured information.

Other Project

Sentiment Analysis for Long Sequence with BERT | *Personal Project* **April 2020 - July 2020**

- Integrated a lexicon-based approach with BERT for efficient sentiment classification of Stanford movie reviews.
- Developed an innovative pre-training technique for large language models, emphasizing word polarization.
- Implemented a Sentiment Attention Mask, based on SentiWordNet, to streamline resource usage and time for training and inferring with the BERT model.
- GitHub: https://github.com/KnightZhang625/Project_SentimentAnalysis

TensorFlow Version for the UniLM | *Personal Project* **Oct 2019 – Dec 2019**

- Since the original implementations of UniLM model is based on Pytorch. I implemented a TensorFlow version for UniLM from scratch, including the entire process from training to deployment.
- Github: https://github.com/KnightZhang625/BERT_TF

NLP TESLA | *Personal Project* **June 2019 – July 2019**

- Developed NLP TESLA, an open-source framework that rewrites Intel's nlp-architect in TensorFlow v1.15, offering a comprehensive end-to-end pipeline for training, evaluating, and deploying deep-learning models in NLP.
- GitHub: https://github.com/KnightZhang625/TESLA

Natural Language Generation with Various Styles | *Master Dissertation* **May 2018 – Sep 2018**

- Conducted a study on the utilization of structured texts for generating sentences in diverse styles, under the supervision of Prof. Andreas Vlachos, achieving a Distinction grade for this dissertation.
- Applied hierarchical clustering to analyze the golden output data, identifying the semantic variety present within the text data.
- Trained a neural language model using a single Bi-LSTM encoder and multiple LSTM decoders, each corresponding to a different data cluster.
- Developed various statistical language models for each cluster to evaluate the quality of sentences generated by the trained neural language model.
- Github: https://github.com/KnightZhang625/Master-Dissertation

Service to the Research Community

1. **3nd MATH-AI Workshop at NeurIPS'23 Reviewer**, Oct 2023
2. **CogSci 2024 Reviwer**, Feb 2024

Honors & Rewards

1. **NeurIPS 2022 Scholar Award**, received in Oct 2022.
2. **Strathclyde Centre for Doctoral Training Research Studentship**, recipient of the studentship for the PhD study.