Jiaxin Zhang

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Summary

I am currently a PhD student in Artificial Intelligence at the University of Strathclyde, my research focuses on advancing AI's numerical reasoning through deep learning technologies. 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 – May 2024 (Estimated)**
PhD in Computer and Information Sciences *Glasgow, UK*

- Thesis: Automated Mathematical Reasoning in Artificial Intelligence over Textual and Multi-Modal Data
- 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

Work Experience

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

- Lead students to practice implementing the deep learning techniques taught in class.
- Headed the Teaching Assistant team in grading exams and assignments.

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.

Publications

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

Accepted Papers

1. Jiaxin Zhang*, Yashar Moshfeghi. **ELASTIC: Numerical Reasoning with Adaptive Symbolic Compiler**. Accepted for Advances in Neural Information Processing Systems 35 (NeurIPS 2022).
2. 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).

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

3nd MATH-AI Workshop at NeurIPS'23 | *Reviewer* **Oct 2023**

- Be invited to serve as a reviewer for paper submissions to the 3rd MATH-AI Workshop at NeurIPS 2023.