ZHEN ZHANG

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EDUCATION

Tsinghua University Beijing, China

Bachelor of Science in Mathematics and Physics Sept 2019 – Expected July 2023

- **Honors & Awards:** Silver Medal in the 35th Chinese Physics Olympiad, Academic Excellence Award (2021-2022)
- **Relevant Courses:** Foundation of Object-Oriented Programming, Data Structures, Discrete Mathematics, Theory of Computer Network, Artificial Neural Networks

PUBLICATIONS

Sparse Structure Search for Delta Tuning (NeurIPS 2022)

Shengding Hu*, **Zhen Zhang***, Ning Ding, Yadao Wang, Yasheng Wang, Zhiyuan Liu, Maosong Sun

(* indicates equal contribution)

Parameter-Efficient Cross-lingual Transfer Learning of Vision and Language Models via Translation-based Alignment (under review, submitted to ACL 2023)

Zhen Zhang, Jialu Wang and Xin Eric Wang

RESEARCH EXPERIENCE

University of California, Santa Cruz Online

Summer Internship with Professor Xin Eric Wang Jul 2022 – Present

Eric Lab

- Addressed the multilingual disparity of vision and language foundation models such as CLIP.
- Proposed a unified framework by translation and taking advantage of parallel data. Methods for mapping multilingual texts to the same language space and aligning them improve multilingual disparity.
- Paper has been submitted to ACL 2023

Tsinghua University Beijing, China

Research Assistant to Professor Zhiyuan Liu Jan 2022 – Present

THUNLP

- Participated in developing a toolkit called OpenDelta, an open-source framework for parameter-efficient tuning.
- By using this toolkit, users could easily implement various types of parameter-efficient tuning with preferred pre-trained models.
- Tested and adapted more Transformer-based models to OpenDelta.
- This work will be submitted to ACL 2023

Tsinghua University Beijing, China

Research Assistant to Professor Zhiyuan Liu Jan 2022 – May 2022

THUNLP

- Presented a method that automatically Search for the Sparse Structure of Delta Tuning (S^3Delta).
- S^3Delta conducts the differentiable parameter-efficient tuning (PET) structure search through bi-level optimization, and uses Shifted Global Sigmoid method to explicitly control the number of trainable parameters and optimize the combination of various current PET methods.
- S^3Delta preserves more than 99% of fine-tuning performance with 0.01% trainable parameters.
- This work has been accepted by NeurIPS 2022.

Tsinghua University Beijing, China

Research Assistant to Professor Zhiyuan Liu May 2021 – Jan 2022

THUNLP

- Explored the performance of the pre-trained model (BERT, T5) in keyword extraction.

- Studied the inferential capability and reasoning depth of the pre-trained model as a soft reasoner on closed-world reasoning tasks.
- Utilized model distillation to accelerate the training process of Soft Prompt.

SELECTED COURSE PROJECTS

Paper Reproduction

- Course project for course Artificial Neural Networks.
- This repository provides a reproduction based on the framework Jittor for the paper 'Table-to-text Generation by Structure-aware Seq2seq Learning' selected in AAAI2018.

Slow Electron Velocity Imaging

- Course project for course Big Data in Experimental Physics taught by Benda Xu.
- Trained ResNet34 from scratch to accurately reconstructs the coefficients of the Lejeune equation in the electron velocity field.

EXTRACURRICULARS

Small Animal Protection Association, Tsinghua University Beijing, China
Volunteer & Member Oct 2020-Oct 2021

- Rescued stray animals, reviewed the qualifications for applying for pet adoption, and assisted in the work of the stray animal shelter.