

ZHEN ZHANG

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EDUCATION

Tsinghua University

BS in Mathematics and Physics

Beijing, China

Sep 2019 – Jul 2023 (expected)

- Selected awards:
 - Silver Medal in the 35th Chinese Physics Olympiad
 - Academic Excellence Award in 2021-2022
- Selected Courses:
 - Foundation of Object-Oriented Programming
 - Data Structures
 - Discrete Mathematics
 - Theory of Computer Network
 - Artificial Neural Networks

PUBLICATION

[Sparse Structure Search for Parameter-Efficient Tuning \(NeurIPS 2022\)](#)

Shengding Hu*, Zhen Zhang*, Ning Ding, Yadao Wang, Yasheng Wang, Zhiyuan Liu, Maosong Sun
(*equal contribution)

RESEARCH EXPERIENCE

University of California, Santa Cruz

Summer Internship with Professor Xin Eric Wang

Online

Jul 2022 – Now

Eric Lab

- Cross-lingual Transfer Learning of Vision and Language Models.
- Addressed the multilingual disparity of vision and language foundation models such as CLIP
- Maximized the mutual information between the image and sentences in different languages while minimizing multivariate mutual information among them.
- Inserted parameter-efficient modules into the image model of multi-lingual CLIP, which are conditional on automatically generated language embeddings.

Tsinghua University

Research Assistant to Professor Zhiyuan Liu

Beijing, China

Jan 2022 – Now

THUNLP

- Participated in developing a toolkit named [OpenDelta](#), an open-source framework for parameter-efficient tuning.
- Tested emerging models and adapted more Transformer-based models to OpenDelta.

Tsinghua University

Research Assistant to Professor Zhiyuan Liu

Beijing, China

Jan 2022 – Mar 2022

THUNLP

- Presented a method which automatically Search for the Sparse Structure of Parameter-Efficient Tuning (S³PET). S³PET conducts the differentiable PET structure search through bi-level optimization, proposes Shifted Global Sigmoid method to explicitly control the number of trainable parameters and optimize the combination of various current parameter-efficient tuning(PET) methods (Prefix, LoRA, Adapter, BitFit, etc.).
- S³PET preserves more than 99% fine-tuning performance with 0.01% trainable parameters.
- This work has been accepted by NeurIPS 2022.

Tsinghua University
Research Assistant to Professor Zhiyuan Liu

Beijing, China
May 2021 – Jan 2022

THUNLP

- The study of Pre-trained Models for Natural Language Processing.
- 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 (Transformer) as a soft reasoner on closed-world reasoning tasks.
- Utilized model distillation to accelerate soft prompt training and improve its performance.

Tsinghua University
Research Assistant to Professor Wenwu Zhu

Beijing, China
Oct 2020 – Feb 2021

Student Research Training

- Combined AutoML with graph machine learning and read papers to design workable models.
- Learned NAS algorithms such as DARTS and graph neural network algorithm GCN.

SELECTED COURSE PROJECT

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.
- Trained ResNet34 from scratch to accurately reconstructs the coefficients of the Lejeune equation in the electron velocity field.

EXTRACURRICULAR EXPERIENCES

Small Animal Protection Association, Tsinghua University
Volunteer & Member

Beijing, China
Oct 2020-Oct 2021

- Rescued stray animals, reviewed the application qualification of animal adoption, and assisted in the work of stray animal shelter center.