Tiejin Chen

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Education

Arizona State University Expected May 2028
PhD in Computer Science *Tempe,AZ*
- **Advisor:** Hua Wei
- **GPA:** 4.00/4.00

University of Michigan 2021-2023
MS in Applied Statistics *Ann Arbor,MI*
- **GPA:** 3.98/4.00

Sichuan University 2016-2020
Bachelor in Statistics *Chengdu,Sichuan*
- **GPA:** 3.55/4.00 | 86.59/100
- **Rank:** 4/33

Paper

Tiejin Chen, Longchao Da, Huixue Zhou, Pingzhi Li, Kaizhong Zhou, Tianlong Chen, Hua Wei. *Privacy-preserving Fine-tuning of Large Language Models through Flatness*. In SeT LLM Workshop @ ICLR 2024.
LongChao Da, Kuanru Liou, **Tiejin Chen**, Xuesong Zhou, Xiangyong Luo, Yezhou Yang, Hua Wei *Open-TI: Open Traffic Intelligence with Augmented Language Model*. In LLM Agent Workshop @ ICLR 2024.
Kai Ye, **Tiejin Chen**, Hua Wei, Liang Zhan *Uncertainty Regularized Evidential Regression*. In Proceedings of the Thirty-Eighth AAAI Conference on Artificial Intelligence (AAAI' 24).
Chen Hongxu, **Chen Tiejin**, Wang Hao, Tian Wei *Prison term prediction of dangerous driving based on probabilistic graphical model.* Journal of Sichuan University(Natural Science Edition).

Preprint Paper

Tiejin Chen, Wenwang Huang, Linsey Pang, Dongsheng Luo, Hua Wei *Are Classification Robustness and Explanation Robustness Really Strongly Correlated? An Analysis Through Input Loss Landscape*. arXiv preprint arXiv:2403.06013,2024.
Tiejin Chen*, Yuanpu Cao*, Yujia Wang*, Cho-Jui Hsieh, Jinghui Chen *Federated Learning with Projected Trajectory Regularization*. arXiv preprint arXiv:2312.14380,2023.
Zicheng Wang, **Tiejin Chen**, Qinrun Dai, Yueqi Chen, Hua Wei, Qingkai Zeng *When eBPF Meets Machine Learning: On-the-fly OS Kernel Compartmentalization*. arXiv preprint arXiv:2401.05641,2024.
Tiejin Chen*, Yicheng Tao* *Learning sparsity and randomness for data-driven low rank approximation*. arXiv preprint arXiv:2212.08186, 2022.

Research Projects

Relationship between Classification Robustness and Explanation Robustness 10/2023 – 03/2024
- Submitted paper is under review.
- Obtain models with different level of explanation robustness through adversarial training;
- Visualize the input loss landscape w.r.t explanation loss with models with different level of explanation robustness;
- Come up with a flat-aware training algorithm which manually adjust the input loss landscape w.r.t explanation loss;
- Experimental results show that previous conclusion that there is a strong correlation between classification robustness and explanation robustness might be wrong.

Differential Privacy Fine-tuning for LLMs 09/2023 – 02/2024
- Submitted paper is under review of ICML2024.
- Explore the weight loss landscape of differential private models;
- Come up with three methods from perspective of cross-layers, within-layers and cross-models to flatten the weight loss landscape during differential private training;

- Experimental results on both black-box and white-box setting shows that the methods can bridge the performance gap between DP LLMs and normal trained LLMs;

Dataset Condensation 04/2022 – 02/2023

- Supervised by Prof.Jinghui Chen at Pennsylvania State University
- Research about Dataset Condensation which aims to creating a much less dataset than original one and network trained on this new dataset can have similar performance with network trained on original dataset;
- Explore method which aims to have state-of-the-art performance; Try to combine Dataset Condensation with continual learning method such as AGEM;
- Research about utilizing dataset condensation to extract global information under federated learning and using global information to reduce the influence of Non-I.I.D federated learning.

Algorithm Competition: Adversarial Robustness of Deep Learning Based on ImageNet 08/2022 – 11/2022

- Attended the algorithm competition sponsored by Pazhou Lab, Guangzhou, which aims to get high average accurate on ImageNet under different white box attacks such as AutoAttack with different radius of perturbation;
- Replaced ReLU in Wide-ResNet with a more smoothing activation function such as SiLU to make the loss landscape smoother which is beneficial to robustness of deep learning model;
- Added Non-local means denoising filters to ResNet, which can reduce the affect of perturbation from white box attacks;
- Adversarially trained several ResNet and EfficientNet under AutoAttack with different radius on ImageNet, and trained a ensemble model with all models and a pertain Swin Transformer to get a final model;
- Ranked 5th among all participants and won a prize about 6000 dollars.

Learning Sparsity and Randomness for Data-driven Low Rank Approximation 09/2022 – 12/2022

- Came up with one method that can learn a sparsity patterns for low rank approximation with sketch matrix; Came up with another method that can learn a Gaussian distribution of value in sketch matrix instead of fixed value by trick of reparameterization;
- Designed several experiments to show that our method can learn a better sparsity patterns than previous methods and replacing fixed values with random distributions can increase the performance of low rank approximation.

Studies on Key AI Technologies Supporting A High Quality and Highly Efficient Court Trial 03/2019 – 01/2021

- supervised by Prof. Hao Wang at Sichuan University;
- Built the probabilistic graphical model for different crime;
- Increased model performance by encoding the data with auto-encoder;
- Attended national seminar 2019 in June.

Experience

Points Technology 03/2021 – 08/2021

Algorithm Intern *Shanghai*

- Get to learn federated learning. Reproduce the vertical logistic regression in federated learning way by numpy. Learn some basic knowledge of homomorphic encryption and secret sharing;
- Research about the recommendation system. Reproduce the SVD,FM,FunkSVD,BiasSVD algorithm with numpy, reproduce AutoRec. Denoisy AutoRec,NFM,AFM,AFN,NFM,FiBiNet,DeepFm etc. deep learning recommendation algorithm by Pytorch;
- Design a vertical DeepFm algorithm. Work with team to realize the vertical DeepFm.

Technical Skills

Technologies: Python, R, Basic CPP, PyTorch, Transformers
Hobbies: Mystery Novels, Oscar Predication
Extracurricular Activities: Deputy director of Reasoning Association for organizing mystery games and organizing Sichuan University to join in the national BBS mystery contest.