Chen Tiejin

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Education Background

Arizona State University, *School of Computing and Augmented Intelligence* 08/2023-present

- Ph.D. in Computer Science
- Advisor: Prof. Hua Wei
- GPA: 4.00/4.00

University of Michigan, *Department of Statistics* 09/2021-05/2023

- Master of Applied Statistics
- GPA: 3.98/4.00

Sichuan University, *Wu Yuzhang Honors College* 09/2016-07/2020

- Major: Statistics | Degree: Bachelor of Science
- GPA: 3.55/4.00, 86.59/100.00 | Ranking: 4/33
- Awards: Sichuan University Individual Scholarship for 2017-2018 and 2016-2017 academic years, Sichuan University Comprehensive Scholarship for 2018-2019 academic years.

Preprint Paper

Tiejin Chen* and Yicheng Tao*. Learning sparsity and randomness for data-driven low rank approximation. *arXiv preprint arXiv:2212.08186, 2022.*

Tiejin Chen*, Yuanpu Cao*, Yujia Wang*, Cho-Jui Hsieh, Jinghui Chen Federated Learning with Projected Trajectory Regularization. *arXiv preprint arXiv:2312.14380,2023.*

LongChao Da, Kuanru Liou, **Tiejin Chen,** Xuesong Zhou, Xiangyong Luo, Yezhou Yang, Hua Wei Open-TI: Open Traffic Intelligence with Augmented Language Model. *arXiv preprint arXiv: 2401.00211,2023.*

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.*

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. *SeT LLM 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)* [J]

Scientific Research Projects

Dataset Condensation 03/2022-02/2023

Remote Research Intern, Pennsylvania State University *Ann Arbor, Michigan*

Supervised by Assistant Professor Jinghui Chen

- 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 under federated learning

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

Research Assistant, Sichuan University *Chengdu, China*

National Key R&D Program of China supervised by Research Professor Wang Hao

- Built the probabilistic graphical model for different crime;
- Increased model performance with auto-encoder;
- Attended national seminar 2019 in June

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Projects and Training Research

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

Member *Ann Arbor, Michigan*

- 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 pervious methods and replacing fixed values with random distributions can increase the performance

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

Member *Ann Arbor, Michigan*

- 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

Image Extension Inspired by Image Inpainting 01/2022 -04/2022

Leader *Ann Arbor, Michigan*

- Course project of EECS545 Machine Learning. The target is to extend artworks with semantic information as well as good texture;
- Came up with several novel methods to transfer difficult image extension problem into image inpainting problem including training and inference method;
- Implemented part of method with some mature image inpainting models such as Partial Convolution and Gated Convolution.
- Utilized Learned Perceptual Image Patch Similarity(LPIPS) loss to improve the performance of models; Calculated Peak Signal-to-Noise Ratio(PSNR) and Structural Similarity Index Measure (SSIM) to evaluate the performance of different method we implemented;

Internships

Points Technology 03/2021-08/2021

Algorithm intern *Shanghai, China*

- 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

Skills & Hobbies

- **Computer Skills:** Python, Basic CPP, R,
- **Extracurricular Activities:** Deputy director of Reasoning Association for organizing mystery games and organizing Sichuan University to join in the national BBS mystery contest.
- **Hobbies:** detective fictions, movies,