Suizhi Huang

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https://jeandiable.github.io/

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Education

Shanghai Jiao Tong University, Shanghai, China 2022.9 – 2025.3 (Expected)

Master Candidate in Electronic Information
Supervisor: Prof. Hongtao Lu @ BCMI Lab GPA: 3.83/4.0

National University of Singapore, Singapore 2024.8 – 2024.11

Visiting Student, Electrical and Computing Engineering

Shanghai Jiao Tong University, Shanghai, China 2018.9 – 2022.6

Bachelor of Arts in French,
Bachelor of Engineering in Information Engineering
Score: 89.6/100

Research Experiences

Few-shot Implicit Function Generation 2024.2 – Now

Keywords: Few-shot Generation, Weight Space Learning, Equivariant Architecture
Implicit Neural Representations (INRs) have emerged as a powerful framework for representing continuous signals. However, generating diverse INR weights remains challenging due to limited training data. We introduce Few-shot Implicit Function Generation, a new problem setup that aims to generate diverse yet functionally consistent INR weights from only a few examples. We propose a framework that can generate new INRs from limited data. The core idea is that functionally similar networks can be transformed into one another through weight permutations, forming an equivariance group. By projecting these weights into an equivariant latent space, we enable diverse generation within these groups, even with few examples.

Federated Multi-Task Learning 2023.9 – Now

Keywords: Multi-Task Learning, Personalized Federated Learning, Hetero-Clients
We introduced a new concept called Hetero-Client Federated Multi-Task Learning, expanding the scope of FMTL to encompass a diverse range of clients, tasks, and data scenarios. We established a mathematical link between the optimization processes of Multi-Task Learning (MTL) and Federated Learning (FL). Additionally, we created experimental benchmarks for FMTL in different FL settings.

Continual Learning with Adaptive Model Merging 2024.6 – 2024.11

Keywords: Continual Learning, Cognitive-inspired AI, Catastrophic Forgetting
Continual Learning (CL) strives to learn incrementally across tasks while mitigating catastrophic forgetting. A key challenge in CL is balancing stability (retaining prior knowledge) and plasticity (learning new tasks). We explore the potential of model merging to enhance the stability-plasticity trade-off, providing theoretical insights that underscore its benefits.

Multi-Task Learning for Biomedical Images 2023.4 – 2024.4

Keywords: Multi-Task Learning, Object Detection, Semantic Segmentation, Biomedical Images
Object detection and semantic segmentation are vital in biomedical image analysis. To address challenges in balancing accuracy and speed in multi-task learning, we introduce YOLO-Med, an efficient multi-task network with multi-scale feature extraction and task-specific decoders.

Publications

1. **FedHCA^2: Towards Hetero-Client Federated Multi-Task Learning**
   Yuxiang Lu*, **Suizhi Huang***, Yuwen Yang, Shalayiding Sirejiding, Yue Ding, Hongtao Lu
   IEEE/CVF Conference on Computer Vision and Pattern Recognition **(CVPR) 2024**, ***co-first author***
2. **YOLO-MED : Multi-Task Interaction Network for Biomedical Images**
   Suizhi Huang, Shalayiding Sirejiding, Yuxiang Lu, Yue Ding, Leheng Liu, Hui Zhou, Hongtao Lu
   IEEE International Conference on Acoustics, Speech and Signal Processing **(ICASSP) 2024 oral**
3. **Few-shot Implicit Function Generation**
   Suizhi Huang, Xingyi Yang, Hongtao Lu, Xinchao Wang
   IEEE/CVF Conference on Computer Vision and Pattern Recognition **(CVPR) 2025**, *under review*
4. **Task Indicating Transformer for Task-conditional Dense Predictions**
   Yuxiang Lu, Shalayiding Sirejiding, Yue Ding, Bayram Bayramli, **Suizhi Huang**, Hongtao Lu
   IEEE International Conference on Acoustics, Speech and Signal Processing **(ICASSP) 2024 oral**
5. **UNIDEAL: Curriculum Knowledge Distillation Federated Learning**
   Yuwen Yang, Chang Liu, Xun Cai, **Suizhi Huang**, Hongtao Lu, Yue Ding
   IEEE International Conference on Acoustics, Speech and Signal Processing **(ICASSP) 2024 oral**
6. **BARTENDER: A Simple Baseline Model for Task-level Heterogeneous Federated Learning**
   Yuwen Yang, Yuxiang Lu, **Suizhi Huang**, Shalayiding Sirejiding, Chang Liu, Muyang Yi, Zhaozhi Xie, Yue Ding, Hongtao Lu
   IEEE International Conference on Multimedia and Expo **(ICME) 2024**
7. **Federated Multi-Task Learning on Non-IID Data Silos: An Experimental Study**
   Yuwen Yang, Yuxiang Lu, **Suizhi Huang**, Shalayiding Sirejiding, Hongtao Lu, Yue Ding
   ACM SIGMM International Conference on Multimedia Retrieval **(ICMR) 2024**
8. **Adaptive Task-Wise Message Passing for Multi-Task Learning: A Spatial Interaction Perspective**
   Shalayiding Sirejiding, Bayram Bayramli, Yuxiang Lu, **Suizhi Huang**, Hongtao Lu, Yue Ding
   IEEE Transactions on Circuits and Systems for Video Technology **(TCSVT) 2024**
9. **Optimization of convolutional neural networks for background suppression in the PandaX-III experiment**
   Shangning Xia, **Suizhi Huang**, Kexin Xu, Tao Li, Xun Chen, Ke Han,Shaobo Wang
   Journal of Physics G: Nuclear and Particle Physics 2023

♡ Honors and Awards

National Scholarship of China	**2024.11**
Huatai Securities Science and Technology Scholarship	2024.1
Outstanding Graduate of SJTU	2022.6
Outstanding Student of SJTU	2021.10 & 2019.10
SJTU School Scholarship	2020 & 2021
SJTU SPEIT ARDIAN Enterprise Award	2019

Skills

Programming Languages: Python, C/C++
Development: PyTorch, OpenCV, Git, CUDA
English Proficiency: TOEFL iBT:111, CET6: 564
French Proficiency: DELF B2
Document Writing: LaTeX, Markdown