Suizhi Huang

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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

Shanghai Jiao Tong University, Shanghai, China 2018.9 – 2022.6

Bachelor of Arts in French,

Bachelor of Science in Information Engineering

Score: 89.6/100

Research Experiences

Parameter Diffusion for Multi-Task Learning 2024.2 – Now

Keywords: Multi-Task Learning, Parameter Diffusion

Parameter Diffusion for Multi-Task Learning is a technique that involves sharing and transferring parameters between tasks in a multi-task learning setting. By allowing parameters to diffuse or transfer across tasks, this approach aims to improve the learning efficiency and performance of models by leveraging shared knowledge and relationships between different tasks.

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.

Multi-Task Learning for Biomedical Images 2023.4 – 2023.9

Keywords: Multi-Task Learning, Object Detection, Semantic Segmentation, Biomedical Images

Object detection and semantic segmentation are vital in biomedical image analysis. While single-task networks perform well, multi-task networks are preferred for handling both tasks simultaneously. To address challenges in balancing accuracy and speed, we introduce YOLO-Med, an efficient multi-task network with multi-scale feature extraction and task-specific decoders. YOLO-Med incorporates a cross-scale task-interaction module for information fusion, showing promising results on various datasets.

Global Optimization for Point Cloud Matching using Frequency Information 2021.9 – 2022.6

Keywords: SLAM, Phase Correlation, Point Cloud Registration, ICP, Frequency Information

The accuracy and robustness of the point cloud registration algorithm are crucial for SLAM navigation. We propose a phase correlation-based ICP algorithm that uses frequency domain information for global optimization, surpassing traditional ICP in accuracy and stability, even with large datasets and noise.

Publications

1. **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
3. **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
4. **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
5. **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, *under review*
6. **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, *under review*
7. **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), *under revision*
8. **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

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++
Platform: Linux, Windows, Docker
Development: PyTorch, OpenCV, Git, CUDA
English Proficiency: CET6: 564
French Proficiency: DELF B2
Document Writing: LaTeX, Markdown