Yining Mao

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🎓 Education

Stanford University, California, USA   09/2022 – Present
Master student in Electronics Engineering (EE), expected 06/2024

Zhejiang University, Zhejiang, China   09/2018 – 06/2022
B.E. in Computer Science and Technology (CS)
- **GPA: 3.92**/4.0 (**90.2**/100); Junior&Senior year GPA: 3.98/4.0 (92.8/100)
- **Rank: top 2%** of 269 students
- *Main Courses and Scores:* Computer Vision (97), Operating System (97), C Programming (95), Computer Graphics (93), Computer Networks (94), Theory of Computation (93), Linux Programming (95), Computer Architecture (98), Object-Oriented Programming (95), Digital Image Processing (96)

Massachusetts Institute of Technology, Massachusetts, USA (Remote)   08/2022
Summer Program (course based)
- *Courses:* Machine Learning; Deep Learning; Group Project: "COVID-19 detection from X-Ray Images" (90)

📖 Publications & Manuscripts

On the nonlinear correlation of ML performance between data subpopulations 📄 </>
Weixin Liang*, **Yining Mao***, Yongchan Kwon*, Xinyu Yang, James Zou
ICML 2022 Workshop on Principles of Distribution Shift
ICML 2022 Workshop on Spurious Correlations, Invariance, and Stability

Learning Graph Neural Networks for Image Style Transfer 📄 </>
Yongcheng Jing, **Yining Mao**, Yiding Yang, Yibing Zhan, Mingli Song, Xinchao Wang, Dacheng Tao.
ECCV 2022

Safe Distillation Box 📄
Jingwen Ye, **Yining Mao**, Jie Song, Xinchao Wang, Cheng Jin, Mingli Song.
AAAI 2022

Mutual-Complementing Framework for Nuclei Detection and Segmentation in Pathology Image 📄
Zunlei Feng, Zhonghua Wang, Xinchao Wang, **Yining Mao**, Thomas Li, Jie Lei, Yuexuan Wang, Mingli Song.
ICCV 2021

A Location Constrained Dual-branch Network for Reliable Diagnosis of Jaw Tumors and Cysts 📄
Jacong Hu, Zunlei Feng, **Yining Mao**, Jie Lei, Dan Yu, Mingli Song.
MICCAI 2021

👥 Selected Research Experience

ML Performance Correlations Under Subpopulation Shifts   04/2022 – 09/2022
Supervisor: Prof. *James Zou*; Co-worker: *Weixin Liang*
Research Intern @ Stanford AI Lab

- Empirically show that out-of-distribution (OOD) performance often has nonlinear ("moon shape") correlation with in-distribution (ID) performance under subpopulation shifts.
- Discover how the results complement and contrast previous works in the presence of spurious correlation.
- **Publication:** *"On the nonlinear correlation of ML performance between data subpopulations"*, ICML 2022 Workshop

Image Style Transfer with Graph Neural Networks (GNN)   08/2021 – 02/2022
Supervisor: Prof. *Xinchao Wang*; Co-worker: *Yongcheng Jing* (University of Sydney)
Summer Research Intern @ National University of Signapore (Remote)

- The first to propose a semi-parametric neural style transfer framework with graph neural networks (GNNs).
- Developed an attention-based heterogeneous GNN model using image patches as vertices and introduced a deformable graph convolution operation for cross-scale style-content matching.
- Achieved diversified patch-based stylization with a single model.
- **Publication:** *"Learning Graph Neural Network for Image Style Transfer"*, ECCV 2022

Key-based Safe Knowledge Distillation Box   05/2021 – 09/2021

Supervisor: Prof. *Mingli Song*; Co-worker: *Jingwen Ye*
Undergraduate Research Intern @ Zhejiang University VIPA Lab

- Developed a Safe Distillation Box (SDB) framework aimed at solving the task of intellectual property protection in knowledge distillation.
- Implemented with 3 strategies: key embedding to integrate a random key into training, knowledge disturbance to confuse soft labels, and knowledge preservation to maintain and augment the knowledge.
- **Publication:** *"Safe Distillation Box"*, AAAI 2022

Image Classification with both Noisy Labels and Long-Tailed Distribution   03/2021 – 09/2021

Advisor: Dr. *Lechao Cheng*
Research Intern @ Zhejiang Lab

- To deal with the label noise, proposed an inference matching paradigm to screen out noisy samples and a leave-noise-out regularization to eliminate the effect of the recognized noisy samples.
- To deal with long-tailed distribution, incorporated a prediction penalty based on online prior distribution.
- **Publication:** *"Combating Noisy Labels in Long-Tailed Image Classification"*, arxiv preprint ⧉

▤ SELECTED COURSE PROJECTS

Comparative Study of Watermark Detection & Removal Algorithms *(A)*   04/2020 – 04/2021
Student Research Training Program (SRTP), Supervisor: Prof. *Mingli Song*

- Extensively studied 10+ papers. Reproduced a multi-image matting algorithm and a conditional GAN algorithm. Tested on both public datasets and a self-constructed small dataset.
- Proposed a method to split the dataset by pixel values and train separately to improve results.
- Optimized the matting method to apply on full screen watermarks.

Flashing Flight Game (C++; OpenGL) | *Lead Programmer of 3-member Team (A)*   01/2021

- An integrated tunnel flying game with an installer package (Windows 10).
- Based on OpenGL, implemented and encapsulated the random-generated sweeping tunnels, obj-model import, gravity simulation, real-time collision detection, particle effects and multi-source lighting system.

COVID-19 detection from X-Ray Images (Tensorflow) | *Lead Programmer of 5-member Team (A)*   08/2020

- Leveraged a dataset of 100+ sample to predict the infection, accuracy up to 75%.
- Based on VGG-19, implemented lung-segmentation, transfer learning and Class Activation Mappings.

Chinese Calligraphy Character Retrieval (MatLab) | *Independent Course Project (A+)*   07/2019

- Developed masked erosion/dilation algorithms, elastic meshing technique and directional feature extraction.
- Implemented a graphical interface presenting the results. Recall Ratio > 80% for half samples.

⚙ SKILLS

- **Programming Languages**: Proficient: C/C++, Python; Practiced: Java, JavaScript.
- **Tools**: OpenCV, OpenGL, Pytorch, Tensorflow, Matlab, R, MySQL, Shell, LaTeX, Adobe Ps/Ai/Lr.
- **English Proficiency**: TOEFL: **108** (R28+L29+S24+W27); GRE: V155+Q170+AW3.5; CET-4: 647.

♡ HONORS AND AWARDS

Scholarships

- Outstanding Graduate of Zhejiang University   06/2022
- Outstanding Graduation Thesis   06/2022
- First-Class Scholarship of Zhejiang University (Top 3%)   2019, 2020
- Zhejiang Provincial Government Scholarship   2020

Extracurricular Activities

- 1st Prize of Zhejiang University Powerlifting Competition   05/2022
- 1st Prize of Zhejiang University Bodybuilding Competition   05/2022
- Five-star Volunteer of Zhejiang University: 250+ volunteer hours   05/2020
- Supporting Education (2-week teaching in Yunnan; 2-week teaching in Sichuan)   07/2019, 08/2019