

# YINING MAO

✉ yiningm@stanford.edu · ☎ +1 (360) 228-5970 · 📍 Stanford, CA, USA · 📄 · 🌐 Website

## 🎓 EDUCATION

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**Stanford University**, California, USA 09/2022 – Present

*Master student* in Electrical 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)      – Computer Graphics (93)      – Computer Architecture (98)
  - Operating System (97)      – Computer Networks (94)      – Object-Oriented Programming (95)
  - C Programming (95)      – Theory of Computation (93)      – Digital Image Processing (96)
  - Digital Logic Design (96)      – Linux Programming (95)      – Matlab Image Processing (100)

**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

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**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*

## 👤 RESEARCH EXPERIENCE

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**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 Singapore (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 [\[1\]](#)

## ☰ SELECTED COURSE PROJECTS

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### 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

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- **Programming Languages:** Proficient: *C/C++*, *Python*; Practiced: Java, JavaScript.
- **Tools/Software:** *Pytorch*, *Tensorflow*, OpenCV, OpenGL, Matlab, R, MySQL, Shell,  $\LaTeX$ , Adobe Ps/Ai/Lr.
- **Language:** Native: Chinese; Professional: English (TOEFL: 108).

## ♥️ HONORS AND AWARDS

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### 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

- 1<sup>st</sup> Prize of Zhejiang University Powerlifting Competition 05/2022
- 1<sup>st</sup> 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