

# Penghui YANG

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## EDUCATION

**Nanjing University of Aeronautics and Astronautics**

*Bachelor in Computer Science and Engineering*

Nanjing, China

Sep. 2019 – Jun. 2023

### Relevant Courses:

Linear Algebra (91), Data Structure and Algorithm Design (95),

Pattern Recognition (94), Machine Learning (93), Multivariate Statistical Analysis (94)

## RESEARCH INTEREST

Multi-Label Learning, Weakly Supervised Learning, Knowledge Distillation

## PUBLICATIONS

Penghui Yang\*, Ming-Kun Xie\*, Chen-Chen Zong, Lei Feng, Gang Niu, Masashi Sugiyama, Sheng-Jun Huang. Multi-Label Knowledge Distillation (ICCV'2023)

## RESEARCH EXPERIENCE

### Data Poisoning for Knowledge Distillation

NTU, Singapore

*Research Project at AMI Group | Advisor: Prof. Bo An & Prof. Lei Feng*

Dec. 2022 – Apr. 2023

- Introduce a new learning task called data poisoning for knowledge distillation

### Multi-Label Knowledge Distillation

NUAA, Nanjing

*Research Project at AMI Group | Advisor: Prof. Sheng-Jun Huang & Prof. Lei Feng*

Dec. 2021 – Nov. 2022

- Introduce a new learning task called multi-label knowledge distillation
- Propose a novel method for this problem which exploits the semantic knowledge from the logits by label decoupling and the structural information of label-wise embeddings
- Outperform all comparing methods significantly on multiple datasets and validate the effectiveness of the proposed label-wise embeddings distillation

### A New Method for Class-Conditional Multi-Label Noise (CCMN)

NTU, Singapore

*Research Project at AMI Group | Advisor: Prof. Bo An*

Jun. 2022 – Aug. 2022

- Propose a novel method for learning with CCMN based on entropy maximization and DivideMix
- Achieve comparable performance to baseline models on multiple datasets

### Robustness of Loss Functions for Class-Conditional Multi-Label Noise

NUAA, Nanjing

*Research Project at AL Group | Advisor: Prof. Sheng-Jun Huang*

Oct. 2021 - Mar. 2022

- Disclose that the balanced hamming loss (BHL) and ranking loss (RL) are robust under CCMN
- Show that by using symmetric surrogate losses, the BHL and RL minimization can be achieved efficiently with ordinary SGD optimizer only based on corrupted data without knowing the noise rates

### Pairwise LDAM Loss for Long-Tailed Multi-Label Classification

NUAA, Nanjing

*Research Project at AL Group | Advisor: Prof. Sheng-Jun Huang*

Sep. 2021 - Dec. 2021

- Generalize label-distribution-aware margin loss to ranking loss by minimizing margin-based generalization bound
- Achieve comparable performance to baseline models on multiple datasets

### Robust AUC Maximization for Classification with Pairwise Confidence Comparisons

NUAA, Nanjing

*Research Project at AL Group | Advisor: Prof. Sheng-Jun Huang*

Apr. 2021 - Sep. 2021

- Propose a robust method called PC-AUC to solve pairwise comparison (Pcomp) classification problems by minimizing pairwise surrogate losses
- Prove that there exists a linear dependence between the proposed loss and AUC
- Provide the estimation error bound for the proposed method and prove its consistency with respect to AUC
- Validate the effectiveness of our method after comparing performance to baseline models on multiple datasets

## SKILLS

**Programming Languages:** Python

**Deep Learning Framework:** PyTorch