Xiaoyan Zhang

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Education

Anhui University — Hefei, China
Bachelor of Engineering in Artificial Intelligence — *2021 - 2025(expected)*

- GPA: 4.33/5.0, Rank: 1/251
- Coursework: Advanced Mathematics A(97), Linear Algebra A(95), Probability Theory and Mathematical Statistics A(99), Discrete Mathematics(94), Java Technology and Its Applications (Practice)(100), Python Programming(99),Machine Learning(99), Digital Image Processing (bilingual)(98), Natural Language Processing(97), Experiments in Computer Vision(97), Software Project(96)

Purdue University — West Lafayette, USA
Intern in Electrical and Computer Engineering — *May. 2024 - Present*

- Labortary: Video and Image Processing Laboratory (VIPER)
- Advisor: Fengqing Zhu and Edward J. Delp

Nanyang Technological University — Singapore, Singapore
2023 Summer School Program — *Jun. 2023 - Aug. 2023*

- Theme: Machine Learning & Deep Learning Methodologies
- Advisor: Chew Soon Beng

Publications

[1] **Learning Frequency and Structure in UDA for Medical Object Detection**
Zhang Xiaoyan*, Liwen Wang*, Guannan He, Ying Tan, Shengli Li, Bin Pu, Zhe Jin, Wen Sha, Xingbo Dong.
Chinese Conference on Pattern Recognition and Computer Vision (PRCV), 2024.

[2] **Validating Privacy-Preserving Face Recognition under a Minimum Assumption**
Zhang Hui, Dong Xingbo, Lai YenLung, Zhou Ying, **Zhang Xiaoyan**, Lv Xingguo, Jin Zhe, Li Xuejun.
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024.

[3] **MFP3D: Monocular Food Portion Estimation Leveraging 3D Point Clouds (Oral)**
Jinge Ma, **Xiaoyan Zhang**, Gautham Vinod, Siddeshwar Raghavan, Jiangpeng He, Fengqing Zhu.
International Conference on Pattern Recognition (ICPR) MADiMa workshop, 2024.

[4] **Single Source Domain Generalization for Palm Biometrics** (Under review)
Congcong Jia, Xingbo Dong, Yen Lung Lai, Andrew Beng Jin Teoh, Ziyuan Yang, **Xiaoyan Zhang**, Liwen Wang, Zhe Jin, Lianqiang Yang. *Pattern Recognition*, 2024.

[5] **On the Duality of Luminance: A Direct Perception Approach for Low-Light Image Enhancement** (Under review) Xingguo Lv, Xingbo Dong, **Xiaoyan Zhang**, Jiewen Yang, Zhe Jin, Xuejun Li, Jean-Luc Dugelay.
IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), 2024.

[6] **Long-Tailed Continual Learning For Visual Food Recognition** (Under review)
Jiangpeng He, **Xiaoyan Zhang**, Luotao Lin, Jack Ma, Heather A. Eicher-Miller, Fengqing Zhu.
IEEE Transactions on Multimedia (TMM), 2024.

[7] **Physically Informed 3D Food Reconstruction: Methods and Result** (Under review)
Jiangpeng He, Yuhao Chen, Gautham Vinod, **Xiaoyan Zhang**, Talha Ibn Mahmud, Umair Haroon, Ricardo Marques, Petia Radeva, Jiadong Tang, Dianyi Yang, Yu Gao, Zhaoxiang Liang, Yawei Jueluo, Chengyu Shi, Pengyu Wang, Pengcheng Xi, Alexander Wong, Edward Delp, Fengqing Zhu.
Pattern Analysis and Applications (PAA), 2024.

[8] **Exploring Model Weight Uncertainty for Domain Adaptive Medical Image Segmentation** (Under review)
Liwen Wang, Xingguo Lv, **Xiaoyan Zhang**, Zhe Jin, Xingbo Dong.
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2025.

Selected Projects

Long-tail Continual Learning in Food Classification, Purdue University Aug. 2024 – Sep. 2024
Research Intern *Advisor: Fengqing Zhu, Edward J. Delp*

- Introduced three new long-tailed benchmark datasets based on VFN186, which reflect the food consumption patterns of different populations.
- Conducted extensive experiments on all long-tailed continual learning benchmarks for food recognition.

Food Portion Estimation, Purdue University Jun. 2024 – Jul. 2024
Research Intern *Advisor: Fengqing Zhu, Edward J. Delp*

- Designed a Feature Extraction Module that extracts and concatenates features from both 3D point cloud data and 2D RGB images.
- Developed MFP3D, an integrated system for food portion estimation, including a 3D Reconstruction Module, a Feature Extraction Module, and a Portion Regression Module.
- Applied MFP3D to the MetaFood3D dataset for accurate estimation of food volume and energy content.

Unsupervised Domain Adaptation for Medical Object Detection, Anhui University Jan. 2024 – Apr. 2024
Research Assistant *Advisor: Zhe Jin, Xingbo Dong*

- Synchronized detection in source and target domains by aligning topological representation.
- Employed ResNet-101 as the feature extractor and FCOS as the detector. Implemented the designed model FS-UDA on two datasets of cardiac standard views, each of which includes data from two hospitals.
- Validated the effectiveness of FDA and OSA. Performed t-SNE visualization of ResNet-101-based features, and clear separation of similar categories demonstrated the effectiveness of FS-UDA to distinguish organs.

Validation of Privacy-Preserving Face Recognition, Anhui University Jun. 2023 – Nov. 2023
Research Assistant *Advisor: Zhe Jin, Xingbo Dong*

- Constructed the query-efficient reconstruction model, and used it for PPFR evaluation.
- Evaluated the result by developing a privacy leakage evaluation scale, including reconstruction visual quality analysis, visual privacy analysis, and identity privacy analysis.
- Conducted ablation experiments to obtain privacy validation results. Found that PSC and REI modules significantly contribute to the similarity between our results and targets.

Applications of Machine Learning and Deep Learning, NTU Jul. 2023 - Aug. 2023
Undergraduate Visitor *Advisor: Chew Soon Beng, Kuicai Dong*

- Learned the basic concepts and algorithms of machine learning, and classic methods of deep learning, including data processing and mining, computer vision, natural language processing, etc.
- Participated in the data processing and analysis project, analyzed the public bicycle dispatching situation of BikeShare, found the influencing factors of vehicle use, and formulated the optimal vehicle allocation strategy.

Teaching Experience

Teaching Assistant of Introduction to Artificial Intelligence, *Anhui University* 2024 Fall
Teaching Assistant of Java Technology and Its Application (Practice), *Anhui University* 2024 Fall
Academic Peer Mentor, *Anhui University* May. 2023 – May. 2024

Awards and Honors

National Scholarship, *Ministry of Education of the People's Republic of China* 2024
Honarable Mentioned in the Interdisciplinary Contest in Modeling, *the Consortium for Mathematics and Application* 2024
Outstanding Mentioned in the Second "Huashu Cup" International Mathematical Contest in Modeling 2024
Song Qingling Future Grant for Discipline Focus Students, *The China Song Qingling Foundation* 2024
Pacemaker to Merit Student, *Anhui University* 2022, 2023, 2024
Merit Student, *Anhui University* 2022, 2023, 2024
Excellent Student Scholarship, *Anhui University* 2023
Academic Science and Technology Scholarship, *Anhui University* 2023
Provincial Second Prize in China Undergraduate Mathematical Contest in Modeling, *China Society for Industrial and Applied Mathematics* 2023
Provincial Silver Award in China International College Students' Innovation Competition, *Ministry of Education of Anhui Province* 2023
National Encouragement Scholarship, *Ministry of Education of Anhui Province* 2022