Feng Wang

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Personal Profile

A prospective PhD student to Johns Hopkins University, advised by Prof. Alan L. Yuille, with a research focus on the intersection of computer vision and natural language processing, in particular vision-language understanding and multi-modality content generation

Education

Johns Hopkins University — *Baltimore, Maryland, U.S.*

Ph.D. in Computer Science — *Aug. 2023 -*

- Joining this fall!

Tsinghua University — *Beijing, China*

M.S. in Data Science — *Aug. 2019 - Jun. 2022*

- **GPA: 3.98/4.0,** ranked the 3rd in the Department of Automation, Tsinghua University
- **Major Courses:** Data Mining Theories and Algorithms (A) / Pattern Recognition (A-) / Big Data Modeling and Analysis (A+) / Fundamentals of Big Data Systems (A) / Optimization and System Engineering (A-) / Convex Optimization (A-).

Xi'an Jiaotong University — *Xi'an, China*

B.E. in Electrical Engineering — *Aug. 2015 - Jun. 2019*

- **GPA (major): 3.88/4.3 (90.38/100),** GPA (overall): 3.70/4.3 (87.97/100)
- **Mathematics related courses:** Advanced Mathematics (97) / Probability Theory and Mathematical Statistics (96) / Complex Analysis and Integral Transformation (98) / Mathematical and Physical Equations (99)
- Won first prize in the National University Student Mathematics Competition (Shaanxi Province, Mar.2018)

Publications

[1] Feng Wang, Huiyu Wang, Chen Wei, Alan Yuille, Wei Shen. "CP2: Copy-Paste Contrastive Pretraining for Semantic Segmentation" In ECCV, 2022. Link: http://arxiv.org/abs/2203.11709

[2] Feng Wang, Manling Li, Xudong Lin, Alexander G. Schwing, Heng Ji. "Learning to Decompose Visual Features with Latent Textual Prompts" In ICLR, 2023. Link: http://arxiv.org/abs/2210.04287

[3] Feng Wang, Guoyizhe Wei, Qiao Liu, Jinxiang Ou, Xian Wei, Hairong Lv. "Boost Neural Networks by Checkpoints" In NeurIPS, 2021. Link: http://arxiv.org/abs/2110.00959

[4] Feng Wang, Jinxiang Ou, Hairong Lv. "Gradient Boosting Forest: A Two-Stage Ensemble Method Enabling Federated Learning of GBDTs" In ICONIP, 2021.

[5] Jinxiang Ou, Yunheng Shen, Feng Wang, et al. "AggEnhance: Aggregation Enhancement by Class Interior Points in Federated Learning with Non-IID Data" In ACM TIST, 2021.

Research & Internship Experience

Microsoft Research Asia — *Beijing, China*

Research-Oriented Intern — *July 2022 - Present*

- Investigated the pretraining of vision transformers and designed a novel self-attention processing mechanism to capture local features.
- Developed a zero-shot and decoder-free semantic segmentation model by aligning text to pixel-level image representations.
- Obtained 58.8% and 36.5% context-aware mIoU in PASCAL VOC 2012 and ADE20k without using downstream training samples.

University of Illinois, Urbana-Champaign — *Urbana, IL*

Research Assistant, advised by **Prof. Heng Ji** and **Prof. Alexander Schwing** — *Mar. 2022 - Aug. 2022*

- Presented a novel vision-language contrastive learning model that decoupled visual features from semantic targets.
- Learned decomposed and interpretable visual features by leveraging vision-language alignment in the latent space.
- Attained significant improvements over CLIP on a variety of visual benchmarks (e.g., 15.0% higher accuracy on ImageNet).

Johns Hopkins University — *Baltemore, MD*

Research Assistant, advised by **Prof. Alan Yuille** — *May. 2021 - Mar. 2022*

- Designed a dense contrastive learning method that enabled pretraining segmentation models on un-annotated images.
- Addressed the issue of translation and scaling in-variance by introducing copy-pasted images and pixel-wise loss.
- Obtained 78.6% mIoU with a ResNet-50 and 79.5% mIoU with a ViT-S by finetuning our pretrained model on PASCAL VOC 2012.

Tsinghua University *Beijing, China*

Research Assistant, advised by **Prof. Hairong Lv** *Mar. 2020 - May. 2021*

- Proposed a neural network ensemble scheme with adaptive loss and proved its convergence in exponential loss.
- Systematically analyzed Checkpoint Ensemble techniques and studied the effect of sample re-weighting on loss surface.
- Achieved state-of-the-art performance over the existing ensembles with ResNet, DenseNet and EfficientNet architectures.

Academic Service

2023 **Reviewer**, Neural Information Processing System (NeurIPS)

2023 **Reviewer**, Conference on Computer Vision and Pattern Recognition (CVPR)

2022 **Reviewer**, European Conference on Computer Vision (ECCV)

Skills

Programming Python (PyTorch, Tensorflow 1.x/2.x, NumPy, Scikit-learn. etc.), R(ggplot2), C/C++, Matlab.

Miscellaneous Linux, Shell, LaTeX(Overleaf / Markdown), Microsoft Office, Git.

Soft Skills Time Management, Multi-Task Management, Teamwork, Problem-solving, Engaging Presentation.

Achievements

2021 **First Prize**, Tsinghua University Scholarship *Beijing, China*

2018 **First Prize**, National University Student Mathematics Competition *Shaanxi, China*

2017, 2018 **Winner**, University Annual Outstanding Student *Shaanxi, China*

2016-2018 **Winner**, Yuying Scholarship (top 5%), Siyuan Scholarship (top 10%) *Shaanxi, China*