Junfei Xiao

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Education

Johns Hopkins University **2022 -**
Ph.D. in ***Computer Science*** *Baltimore, Maryland*

Johns Hopkins University **Sep. 2019 – May 2021**
M.S.E in ***Computer Science, GPA: 3.97/4.0*** *Baltimore, Maryland*

Beihang University **Sep. 2015 – June 2019**
B.E. in ***Mechanical Engineering****, Double Degree in* ***Mathematics, GPA: 3.8/4.0 (Top 2%)*** *Beijing, China*

Publications and Manuscripts

[7] Yutong Bai, Zeyu Wang, **Junfei Xiao**, Chen Wei, Huiyu Wang, Alan Yuille, Yuyin Zhou, and Cihang Xie. "Masked Autoencoders Enable Efficient Knowledge Distillers". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* (2023).

[6] Qixin Hu, Yixiong Chen, **Junfei Xiao**, Shuwen Sun, Jie-Neng Chen, Alan Yuille, and Zongwei Zhou. "Label-Free Liver Tumor Segmentation". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* (2023).

[5] **Junfei Xiao**, Yutong Bai, Alan Yuille, and Zongwei Zhou. "Delving into Masked Autoencoders for Multi-Label Thorax Disease Classification". In: *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*. 2023.

[4] Qixin Hu, **Junfei Xiao**, Yixiong Chen, Shuwen Sun, Jie-Neng Chen, Alan Yuille, and Zongwei Zhou. "Synthetic Tumors Make AI Segment Tumors Better". In: *NeurIPS Workshop* (2022).

[3] **Junfei Xiao**, Longlong Jing, Lin Zhang, Ju He, Qi She, Zongwei Zhou, Alan Yuille, and Yingwei Li. "Learning from Temporal Gradient for Semi-supervised Action Recognition". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* (2022).

[2] **Junfei Xiao**, Lequan Yu, Zongwei Zhou, Yutong Bai, Lei Xing, Alan Yuille, and Yuyin Zhou. "CateNorm: Categorical Normalization for Robust Medical Image Segmentation". In: *MICCAI Workshop on Domain Adaptation and Representation Transfer*. Springer. 2022, **(Best Paper Honorable Mention)**.

[1] Siqi Wang, Lei Li, Yufeng Chen, Yueping Wang, Wenguang Sun, **Junfei Xiao**, Dylan Wainwright, Tianmiao Wang, Robert J Wood, and Li Wen. "A bio-robotic remora disc with attachment and detachment capabilities for reversible underwater hitchhiking". In: *2019 International Conference on Robotics and Automation (ICRA)*. 2019.

Research Experience

CCVL Lab, Johns Hopkins University **Sep. 2021 – Present**
Research Assistant*, Advisor:* ***Alan Yuille*** *Baltimore, Maryland*

CCVL Lab, Johns Hopkins University **June 2020 – Sep. 2021**
Research Intern*, Advisor:* ***Alan Yuille*** *Baltimore, Maryland*

Medical Robotics Surgery Lab, Beihang University **Feb. 2019 – June 2019**
Research Assistant*, Advisor:* ***Junchen Wang*** *Beijing, China*

Biomechanics and Soft Robotics Lab, Beihang University **Sep. 2017 – Aug. 2018**
Research Assistant*, Advisor:* ***Li Wen*** *Beijing, China*

Selected Projects

Semi-supervised Learning for Action Recognition [Paper] [Code] **CVPR 2022**

- Propose a method that explicitly distills the fine-grained motion representations from temporal gradient (TG) and imposes consistency across different modalities (i.e., RGB and TG).
- The performance of semi-supervised action recognition is significantly improved without additional computation or parameters during inference.
- Our method achieves the state-of-the-art performance on three video action recognition benchmarks (i.e., Kinetics-400, UCF-101, and HMDB-51) under several typical semi-supervised settings (i.e., different ratios of labeled data).

Multi-domain Learning for Medical Image Segmentation [Paper] [Code] **MICCAI Workshop 2022**

- Propose a method to introduce the semantic class information into normalization layers by incorporating both global image-level statistics and local region-wise statistics.
- The method exploits semantic knowledge at normalization and yields more discriminative features for robust segmentation results.
- The method shows remarkable robustness to data from different domains.

Few-shot Food Detection [Report] [Code]

- Propose a method to learn a feature extractor with base classes and fine-tune the classifier and bounding box regressor with few shot examples from novel classes

SGD-based Annealing Algorithms for Neural Network Optimization [Report]

- Propose two different annealing strategies to improve SGD for neural network optimization.
- Experiment with the proposed algorithms on a 2-D point binary classification dataset and the Fashion-MNIST dataset. The two proposed algorithms with tuned scale of noise and initial temperature show remarkable performance.

Honors and Awards

1st Place in Robust Vision Challenge - Semantic Segmentation Track (ECCV 2022)	2022
Best Paper Honorable Mention - DART (MICCAI Workshop)	2022
Academic Excellence Award	2016, 2017, 2018
JJWorld Scholarship	2017
National Scholarship (**Top 0.1%** national wide)	2016

Service

Program Committee / Reviewer:

ICML 2021/2022 Workshop – Interpretable Machine Learning in Healthcare, **CVPR 2022**, **ECCV 2022**

Technical Skills

Programming Languages: Python, Matlab, C/C++, SQL, Ocaml, Julia
Tools: LaTeX, Git, SolidWorks
Deep Learning Frameworks: Pytorch, Tensorflow
GRE: 162 (Verbal) + 170 (Math) + 3.5 (Writing)