JUNFEI XIAO

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Education

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*

Research Interests

My current research interests are transfer learning with a focus on multi-domain/modal learning and weakly/semi/self-supervised learning in the area of computer vision.

Publications and Manuscripts

[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, Lei Xing, Alan Yuille, and Yuyin Zhou. "DualNorm-UNet: Incorporating Global and Local Statistics for Robust Medical Image Segmentation". In: *arXiv preprint. Under review.* (2021).

[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*
ARCADE Lab, Johns Hopkins University	**Jan. 2020 – May 2020**
*Research Intern, Advisor: **Mathias Unberath***	*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 (CVPR 2022) [Paper]   **May 2021 – Present**
- Propose a method 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]   **May 2020 – Mar. 2021**
- 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]   Nov. 2020 – Jan. 2021
- 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

Cerebral MRI Image Analysis   Jan. 2020 – May 2020
- Decode and Cleaned from raw annotation files to generate labels for training.
- Implement and tune algorithm for brain tumor segmentation on BraTS Dataset

SGD-based Annealing Algorithms for Neural Network Optimization [Report]   Mar. 2020 – May 2020
- 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.

Unsupervised Learning for Monocular Depth Estimation [Report] [Code]   Nov. 2019 – Jan. 2020
- Review unsupervised methods for monocular depth estimation task
- Improve the estimation performance by introducing multiple improvements and re-design part of the network.

Reversible Underwater Hitchhiking for Remora-inspired Robot [Paper]   Sep. 2017 – Aug. 2018
- Optimize the structure and propeller of remora-inspired prototype
- Upgrade the auxiliary motion mechanism with SolidWorks for better imitating the attachment and detachment of remora.

Honors and Awards

Academic Excellence Award	2016, 2017, 2018
JJWorld Scholarship	2017
National Scholarship (**Top 0.1%** national wide)	2016

Service

Program Committee / Reviewer:

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

Relevant Coursework

- Deep Learning
- Computer Vision
- Probabilistic Models Visual Cortex
- Stochastic Optimization
- Augmented Reality
- Robot Devices, Kin, Dyn & Ctrl
- Algo. for Sensor-Based Robotics
- Database

Technical Skills

Programming Languages: Python, Matlab, C/C++, SQL, Ocaml, Julia
Tools: LaTeX, Git, SolidWorks
Deep Learning Frameworks: Pytorch, Tensorflow