



JUNFEI XIAO

Baltimore, Maryland

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Education

Johns Hopkins University

M.S.E in Computer Science, GPA: 3.97/4.0

Sep. 2019 – May 2021

Baltimore, Maryland

Beihang University

B.E. in Mechanical Engineering, Double Degree in Mathematics, GPA: 3.8/4.0 (Top 2%)

Sep. 2015 – June 2019

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: *arXiv preprint. Under review*. (2021).
- [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

Research Assistant, Advisor: Alan Yuille

Sep. 2021 – Present

Baltimore, Maryland

CCVL Lab, Johns Hopkins University

Research Intern, Advisor: Alan Yuille

June 2020 – Sep. 2021

Baltimore, Maryland

ARCADE Lab, Johns Hopkins University

Research Intern, Advisor: Mathias Unberath

Jan. 2020 – May 2020

Baltimore, Maryland

Medical Robotics Surgery Lab, Beihang University

Research Assistant, Advisor: Junchen Wang

Feb. 2019 – June 2019

Beijing, China

Biomechanics and Soft Robotics Lab, Beihang University

Research Assistant, Advisor: Li Wen

Sep. 2017 – Aug. 2018

Beijing, China

Selected Projects

Semi-supervised Learning for Action Recognition [\[Paper\]](#)

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

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

Technical Skills

Programming Languages: Python, Matlab, C/C++, SQL, Ocaml, Julia

Tools: L^AT_EX, Git, SolidWorks

Deep Learning Frameworks: Pytorch, Tensorflow