



# JUNFEI XIAO

Baltimore, Maryland

<https://lambert-x.github.io>

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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 weak/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 incorporate 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

**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

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|   |                  |
|---|------------------|
| Academic Excellence Award                             | 2016, 2017, 2018 |
| JJWorld Scholarship                                   | 2017             |
| National Scholarship ( <b>Top 0.1%</b> national wide) | 2016             |

## Service

### Program Committee / Reviewer:

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

## Relevant Coursework

- |                                      |                                  |                                   |
|--------------------------------------|----------------------------------|-----------------------------------|
| • 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:**  $\text{\LaTeX}$ , Git, SolidWorks

**Deep Learning Frameworks:** Pytorch, Tensorflow