Zhenlin Xu

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Summary

AI/ML researcher with 6+ years of experience in data efficient(semi/weakly/self-supervised learning) [6, 10], robust and generalizable [4, 7] deep learning for vision [2, 5, 11, 8, 9] and multi-modal [1, 3] applications, recognized at top-tier conferences like NeurIPS, ICLR, CVPR. Passionate about enhancing the generalizability and safety of general (multimodal) AI systems.

Education

University of North Carolina at Chapel Hill, Chapel Hill, NC, USA   2022

Ph.D. in Computer Science   Advisor: Marc Niethammer, Colin Raffel

Thesis: *Towards Deep Visual Learning in the Wild: Data-efficiency, Robustness and Generalization*
Research areas: domain/compositional generalization, data-efficient learning, image registration and segmentation

Rochester Institute of Technology (RIT), Rochester, NY, USA   2016

M.S. in Imaging Science   Advisor: Nathan Cahill

Xi'an Jiaotong University, Xi'an, Shaanxi, China   2014

B.S. in Optical Information Science and Technology at Department of Physics

Professional and Research Experience

Independent Research   Now
- Improve semi-parametric Large Language Model (KNN-LLM) with parameter efficient fine-tuning.

Amazon AWS AI Labs, Seattle, WA   07/2022 – Now
- Lead research on studying vision and language models on their granularity and specificity [1].
- Build product models and prototypes [3] for AWS Rekognition services with foundational models.

Google, Mountain View, CA (Remote)   05/2021 – 12/2021

Research Intern / Student Researcher   Host: Marya Khademi, Simon Knornblith, Ting Chen, Dilip Krishnan

- Research on contrastive self-supervised learning for dense visual representation learning [6]

Nvidia, Santa Clara, CA (Remote)   05/2020 – 08/2020

Research Intern   Mentor: Andriy Myronenko, Daguang Xu

- Federated learning with knowledge distillation for non-iid image data

Siemens Healthineers, Pricenton, NJ   05/2019 – 08/2019

Research Intern   Mentor: Eli Gibson, Siqi Liu, Sasa Grbic

- Developed domain adaptation/generalization approaches for semantic segmentation

Duke University Energy Initiative, Durham, NC   06/2017 – 08/2017

Research Intern at Energy Data Analytics Lab   Mentor: Kyle Bradbury

- Research on deep learning based semantic segmentation for remote sensing images.

Skills

Deep Learning, Computer Vision, Natural Language Processing, Multimodal Learning, Data Analysis
- Programming Languages: Python, MATLAB, C++
- DL/ML: PyTorch, Tensorflow(TPU), Numpy, scikit-learn, OpenCV, Distributed model training
- Misc: AWS EC2, Slurm, Docker, Git, Latex

Selected Publications

[1] **Zhenlin Xu**, Yi Zhu, Tiffany Deng, Abhay Mittal, Yanbei Chen, Manchen Wang, Paolo Favaro, Joseph Tighe, and Davide Modolo. Benchmarking Zero-Shot Recognition with Vision-Language Models: Challenges on Granularity and Specificity . *arXiv preprint*, 2023.

[2] Qin Liu, **Zhenlin Xu**, Gedas Bertasius, and Marc Niethammer. SimpleClick: Interactive image segmentation with simple vision transformers. In *ICCV*, 2023.

[3] Yanbei Chen, Manchen Wang, Abhay Mittal, **Zhenlin Xu**, Paolo Favaro, Joseph Tighe, and Davide Modolo. ScaleDet: A scalable multi-dataset object detector. In *CVPR*, 2023.

[4] **Zhenlin Xu**, Marc Niethammer, and Colin Raffel. Compositional generalization in unsupervised compositional representation learning: A study on disentanglement and emergent language. In *NeurIPS (Oral)*, 2022.

[5] Qin Liu, **Zhenlin Xu**, Yining Jiao, and Marc Niethammer. iSegFormer: Interactive Segmentation via Transformers with Application to 3D Knee MR Images. In *MICCAI*, 2022.

[6] Berk Iskender, **Zhenlin Xu**, Simon Kornblith, Enhung Chu, and Maryam Khademi. Improving dense contrastive learning with dense negative pairs. In *NeurIPS Workshop on Self-Supervised Learning - Theory and Practice*, 2022.

[7] **Zhenlin Xu**, Deyi Liu, Junlin Yang, Colin Raffel, and Marc Niethammer. Robust and generalizable visual representation learning via random convolutions. In *ICLR*, 2021.

[8] Zhengyang Shen, **Zhenlin Xu**, Sahin Olut, and Marc Niethammer. Anatomical data augmentation via fluid-based image registration. In *MICCAI*, 2020.

[9] Sahin Olut, Zhengyang Shen, **Zhenlin Xu**, Samuel Gerber, and Marc Niethammer. Adversarial data augmentation via deformation statistics. In *ECCV*, 2020.

[10] **Zhenlin Xu** and Marc Niethammer. DeepAtlas: Joint Semi-Supervised Learning of Image Registration and Segmentation. In *MICCAI*, 2019.

[11] Zhengyang Shen, Xu Han, **Zhenlin Xu**, and Marc Niethammer. Networks for joint affine and non-parametric image registration. In *CVPR*, 2019.

[12] **Zhenlin Xu**, Zhengyang Shen, and Marc Niethammer. Contextual additive networks to efficiently boost 3d image segmentations. In *MICCAI Workshop on Deep Learning in Medical Image Analysis*, 2018.

Academic Service

Reviewer: NeurIPS, ICLR, ICML, AAAI, CVPR, ICCV, MICCAI, TPAMI, TMLR, Medical Image Analysis

Honors and Awards

Royster Society of Fellows Dissertation Fellowship (8 awarded cross UNC and 1 from CS department)   2021

Teaching Experience

Models of Languages and Computation, *Teaching Assistant* , UNC Chapel Hill	2020 Fall, 2021 Spring
Algorithms, *Teaching Assistant* , UNC Chapel Hill	2016 Fall, 2017 Spring
Fourier Methods for Imaging, *Teaching Assistant*, RIT	2015 Spring
Geometry Optics, *Teaching Assistant*, RIT	2014 Fall