Zhenlin Xu

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Summary

Experienced on computer vision, medical image analysis, machine learning, imaging science and physics/optics. Current research is on transferable and generalizable visual representation learning with less human supervision.

Education

University of North Carolina at Chapel Hill, Chapel Hill, NC, USA 2016 -- Expected Dec. 2021

Ph.D. in Computer Science

Rochester Institute of Technology (RIT), Rochester, NY, USA 2014 -- 2016

M.S. in Imaging Science

Xi'an Jiaotong University, Xi'an, Shaanxi, China 2009 -- 2014

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

Experience

Nvidia, Santa Clara, CA 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

UNC Chapel Hill, Chapel Hill, NC 08/2017 - Present

Graduate Research Assistant Advisor: Prof. Marc Niethammer

- Generalized and transferable visual representation learning [1].
- Semi/Weakly-supervised multi-task learning for medical image analysis [5].
- Deep learning based image registration and segmentation [6, 7, 3, 2, 4].

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

Research Intern at Energy Data Analytics Lab Mentor: Dr. Kyle Bradbury

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

Rochester Institute of Technology, Rochester, NY 09/2015 - 08/2016

Graduate Research Assistant Advisor: Prof. Nathan Cahill

- Applied SLIC superpixels in the dimensionality reduction of hyper-spectral images [9].
- Built 3D micro-CT image registration pipeline for atlas-based segmentation [8].

University of Rochester, Rochester, NY 06/2015 - 08/2015

Research Intern at the Center for Visual Science Mentor: Prof. Jesse Schallek

Developed an algorithm for counting blood cells in scanning light ophthalmoscopy (retinal) images.

Xi'an Jiaotong University, Xi'an, Shaanxi, China 09/2013 - 06/2014

Undergraduate Research Assistant at Quantum Optics Lab Advisor: Prof. Pei Zhang

Created a fast approach to evaluate Laguerre-Gaussian laser beam modes based on cross-section images [10].

Skills

- Programming Languages: Python, MATLAB, C++
- DL/CV Packages: PyTorch, Tensorflow, ITK, OpenCV

Teaching Experience

Models of Languages and Computation, *Teaching Assistant* , UNC Chapel Hill — 2020 Fall
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

Professional Service

Reviewer: MICCAI 2019, AAAI 2021, Medical Image Analysis

Publications

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

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

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

[4] Xu Han, Zhengyang Shen, Zhenlin Xu, Spyridon Bakas, Hamed Akbari, Michel Bilello, Christos Davatzikos, and Marc Niethammer. A deep network for joint registration and reconstruction of images with pathologies. In *International Workshop on Machine Learning in Medical Imaging*, pages 342--352. Springer, 2020.

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

[6] Zhengyang Shen, Xu Han, Zhenlin Xu, and Marc Niethammer. Networks for joint affine and non-parametric image registration. In *CVPR*, pages 4224--4233, 2019.

[7] Zhenlin Xu, Zhengyang Shen, and Marc Niethammer. Contextual additive networks to efficiently boost 3d image segmentations. In *Deep Learning in Medical Image Analysis Workshop on MICCAI 2018*, pages 92--100. Springer, 2018.

[8] Zhenlin Xu. 3d subject-atlas image registration for micro-computed tomography based characterization of drug delivery in the murine cochlea. Master's thesis, Rochester Institute of Technology, 2016.

[9] Xuewen Zhang, Selene E Chew, Zhenlin Xu, and Nathan D Cahill. Slic superpixels for efficient graph-based dimensionality reduction of hyperspectral imagery. In *Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XXI*, volume 9472, page 947209. International Society for Optics and Photonics, 2015.

[10] Zhenlin Xu, Tao Zhu, Di Cheng, Junling Long, Ziwei Huang, Ruifeng Liu, Pei Zhang, Hong Gao, and Fuli Li. Accurate and practical method for characterizing laguerre--gaussian modes. *Applied Optics*, 53(8):1644--1647, 2014.