

PERSONAL
INFORMATION

Ph.D. Candidate (ABD)
Department of Computer Science
University of Kentucky
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EDUCATION

University of Kentucky
Ph.D. in Computer Science
Advisor : Nathan Jacobs

Aug. 2017 - Present

Northeastern University (CN)
School of Computer Science and Engineering
B.E. in Telecommunications

Sept. 2013 - June 2017

SKILLS

Experience : deep learning, computer vision, domain adaptation, multi-modal data analysis
Programming : Python, PyTorch, MATLAB, C, C++

PROFESSIONAL
EXPERIENCE

Research Assistant, University of Kentucky, Lexington, KY

Jan. 2020 - Present

- Multi-domain semantic segmentation and depth estimation for unmanned aerial systems.
- Explored astrophysical problems on unbalanced multi-modal data using deep learning.
- Classification, detection, segmentation, and calibration on 2D and 3D medical images.

Teaching Assistant, University of Kentucky, Lexington, KY

Jan. 2018 - Dec. 2019

- CS215 : Introduction to Program Design, Abstraction and Problem Solving
- CS216 : Introduction to Software Engineering Techniques
- CS371 : Introduction to Computer Networking

JOURNAL
PUBLICATIONS

1. Gongbo Liang, Connor Greenwell, **Yu Zhang**, Xiaoqin Wang, Ramakanth Kavuluru, Nathan Jacobs. "Contrastive Cross-Modal Pre-Training : A General Strategy for Small Sample Medical Imaging". In *IEEE Journal of Biomedical and Health Informatics (JBHI)*, 2021. [arXiv:2010.03060](https://arxiv.org/abs/2010.03060)
2. Y. Su, **Yu Zhang**, G. Liang, J. A. ZuHone, D. J. Barnes, N. B. Jacobs, M. Ntampaka, W. R. Forman, R. P. Kraft, P. E. J. Nulsen, C. Jones, E. Roediger. "A deep learning view of the census of galaxy clusters in IllustrisTNG". In *Monthly Notices of the Royal Astronomical Society (MNRAS)*, 2020. [arXiv:2007.05144](https://arxiv.org/abs/2007.05144)
3. Xiaoqin Wang, Gongbo Liang, **Yu Zhang**, Hunter Blanton, Zachary Bessinger, Nathan Jacobs. "Inconsistent Performance of Deep Learning Models on Mammogram Classification". In *Journal of the American College of Radiology (JACR)*, 2020. [Link](#)

CONFERENCE
PUBLICATIONS

4. Gongbo Liang, Xin Xing, Liangliang Liu, **Yu Zhang**, Qi Ying, Ailing Lin, and Nathan Jacobs. "2D Convolutional Neural Networks for Alzheimer's Disease MRI Classification.". In *Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, 2021.
5. **Yu Zhang**, Gongbo Liang, Yuanyuan Su, Nathan Jacobs. "Multi-Branch Attention Networks for Classifying Galaxy Clusters". In *International Conference on Pattern Recognition (ICPR)*, 2020. [Link](#)
6. Gongbo Liang, **Yu Zhang**, Xiaoqin Wang, Nathan Jacobs. "Improved Trainable Calibration Method for Neural Networks on Medical Imaging Classification". In *British Machine Vision Conference (BMVC)*, 2020. [arxiv:2009.04057](https://arxiv.org/abs/2009.04057)
7. Gongbo Liang, Xiaoqin Wang, **Yu Zhang**, Nathan Jacobs. "Weakly-Supervised Self-Training for Breast Cancer Localization". In *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2020. [Link](#)
8. **Yu Zhang**, Xiaoqin Wang, Hunter Blanton, Gongbo Liang, Xin Xing, Nathan Jacobs. "2D Convolutional Neural Networks for 3D Digital Breast Tomosynthesis Classification".

In *IEEE International Conference of Bioinformatics and Biomedicine (BIBM)*, 2019. [arXiv:2002.12314](#)

9. Gongbo Liang, Xiaoqin Wang, **Yu Zhang**, Xin Xing, Hunter Blanton, Tawfiq Salem, Nathan Jacobs. “Joint 2D-3D Breast Cancer Classification”. In *IEEE International Conference of Bioinformatics and Biomedicine (BIBM)*, 2019. [arXiv:2002.12392](#)

WORKSHOP PUBLICATIONS

10. Usman Rafique, **Yu Zhang**, Benjamin Brodie, Nathan Jacobs. “Unifying Guided and Un-guided Outdoor Image Synthesis”. In *IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW) : NTIRE 2021*. [Link](#)
11. Gongbo Liang, Sheng-Chieh Lin, **Yu Zhang**, Yuanyuan Su, Nathan Jacobs. “Optical Wavelength Guided Self-Supervised Feature Learning For Galaxy Cluster Richness Estimate”. In *Conference on Neural Information Processing Systems (NeurIPS) Workshop : Machine Learning and Physical Sciences*, 2020. [arXiv:2012.02368](#)
12. Gongbo Liang, **Yu Zhang**, Nathan Jacobs. “Neural Network Calibration for Medical Imaging Classification Using DCA Regularization”. In *International Conference on Machine Learning (ICML) Workshop : Uncertainty and Robustness in Deep Learning*, 2020. [Link](#)
13. **Yu Zhang**, Gongbo Liang, Tawfiq Salem, Nathan Jacobs. “Defense-PointNet : Protecting PointNet Against Adversarial Attacks”. In *IEEE International Conference on Big Data (BigData) Workshop : The Next Frontier of Big Data From LiDAR*, 2019. [arXiv:2002.11881](#)

ABSTRACTS

14. Gongbo Liang, **Yu Zhang**, Jinze Liu, Nathan Jacobs, Xiaoqin Wang. “Training Deep Learning Models as Radiologists : Breast Cancer Classification Using Combined Whole 2D Mammography and Full Volume Digital Breast Tomosynthesis”. In *Radiological Society of North America 105th Scientific Assembly and Annual Meeting (RSNA)*, 2019.
15. **Yu Zhang**, Gongbo Liang, Nathan Jacobs, Xiaoqin Wang. “Unsupervised Domain Adaptation for Mammogram Image Classification : A Promising Tool for Model Generalization”. In *Conference on Machine Intelligence in Medical Imaging (C-MIMI)*, 2019. [arXiv:2003.01111](#)

TALKS

- “Defense-PointNet : Protecting PointNet Against Adversarial Attacks”, Dec. 2019, IEEE BigData LiDAR Workshop, Los Angeles, CA
- “Unsupervised Domain Adaptation for Mammogram Image Classification : A Promising Tool for Model Generalization”, Sep. 2019, C-MIMI, Austin, TX

AWARDS

- Conference Travel Grant, University of Kentucky, 2019
- ATS Fellowship, University of Kentucky, 2017-2018

SERVICE

- Reviewer for IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)
- Reviewer for IEEE Winter Conference on Applications of Computer Vision (WACV) 2020
- Reviewer for The British Machine Vision Conference (BMVC) 2020, 2021

MEMBERSHIPS

- Institute of Electrical and Electronics Engineers (IEEE), Student Member
- Society for Imaging Informatics in Medicine (SIIM), Student Member