

# YU ZHANG

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## 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  
GPA : 3.89/4.00

*Aug. 2017 - Present*

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

*Sept. 2013 - June 2017*

## SKILLS

**Experience** : Deep Learning, Machine Learning, Computer Vision, Unsupervised Domain Adaptation, Weakly Supervised Learning, Unsupervised Learning, Adversarial Attacks, Point Clouds, Astrophysics Data Analysis, Medical Image Analysis  
**Programming** : Python, PyTorch, MATLAB, C, C++, Shell, SQL

## PROFESSIONAL EXPERIENCE

**Research Assistant**, University of Kentucky, Lexington, KY

*Summer 2019 - Present*

- Developed data augmentation, weakly supervised learning, network calibration, and adversarial attack methods on multiple datasets.
- Applied deep learning on unbalanced astrophysics data to explore the relations between galaxy cluster images and magnetic field, mass, and cooling time.
- Classification, detection, and segmentation on 2D and 3D medical images.

**Teaching Assistant**, University of Kentucky, Lexington, KY

- CS216 : Introduction to Software Engineering Techniques *Fall 2018, Fall 2019*
- CS215 : Introduction to Program Design, Abstraction and Problem Solving *Spring 2019*
- CS371 : Introduction to Computer Networking *Spring 2018*

## MANUSCRIPTS

1. Gongbo Liang, Connor Greenwell, **Yu Zhang**, Xiaoqin Wang, Ramakanth Kavuluru, Nathan Jacobs. "Weakly-Supervised Feature Learning Using a Text and Image Matching Network for Medical Image Analysis". [arXiv:2010.03060](https://arxiv.org/abs/2010.03060)

## JOURNAL PUBLICATIONS

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. **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](#)
5. 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)
6. 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](#)

7. **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](#)
8. 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

9. 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](#)
10. 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](#)
11. **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

12. 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.
13. **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

- Reviewing for IEEE Winter Conference on Applications of Computer Vision (WACV 2020)
- Reviewing for The British Machine Vision Conference (BMVC 2020)

#### MEMBERSHIPS

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