Yu Zhang

Personal Information

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

University of Kentucky *Aug. 2017 - Present*
Ph.D. in Computer Science
Advisor : Nathan Jacobs

Northeastern University (CN) *Sept. 2013 - June 2017*
School of Computer Science and Engineering
B.E. in Telecommunications

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 *May 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
- CS215 : Introduction to Program Design, Abstraction and Problem Solving ×3
- CS216 : Introduction to Software Engineering Techniques ×2
- CS371 : Introduction to Computer Networking ×1

Manuscripts

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". arXiv: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
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 Cluters". 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 to *British Machine Vision Conference (BMVC)*, 2020. arxiv: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 Unguided 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
- 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