Yu Zhang

Personal Information

Ph.D. Student
Department of Computer Science
University of Kentucky
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Education

University of Kentucky *Aug. 2017 - Dec. 2021 (Expected)*
Ph.D. in Computer Science
Advisor : Nathan Jacobs
GPA : 3.89/4.00

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

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 & Under Review

1. **Yu Zhang**, Gongbo Liang, Yuanyuan Su, Nathan Jacobs. "Multi-Branch Attention Networks for Classifying Galaxy Cluters". Submitted to *International Conference on Pattern Recognition (ICPR)*, 2020.
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 machine learning approach to the census of galaxy clusters". Submitted to *Monthly Notices of the Royal Astronomical Society (MNRAS)*, 2020. arXiv:2007.05144
3. Gongbo Liang, Connor Greenwell, **Yu Zhang**, Xin Xing, Xiaoqin Wang, Ramakanth Kavuluru, Nathan Jacobs. "Weakly-Supervised Feature Learning Using a Text and Image Matching Network for Medical Image Analysis". Submitted to *IEEE Transactions on Medical Imaging*, 2020.

Journal Publications

4. 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.

Conference Publications

5. Gongbo Liang, **Yu Zhang**, Xiaoqin Wang, Nathan Jacobs. "Improved Trainable Calibration Method for Neural Networks on Medical Imaging Classification". Submitted to *British Machine Vision Conference (BMVC)*, 2020.
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.

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, **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.
10. **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

11. 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.
12. **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