

Gongbo “Tony” Liang

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Education

- 08/2016 – 12/2020 Ph.D., Computer Science, University of Kentucky, USA
Dissertation: Multi-Modal Medical Imaging Analysis with Modern Neural Networks
Advisor: Dr. Nathan Jacobs
Award: Outstanding PhD Student
- 08/2013 – 05/2016 M.S., Computer Science, Western Kentucky University, USA
Thesis: Pedestrian Detection Using Basic Polyline
Advisor: Dr. Qi Li
- 09/2004 – 07/2008 B.A., Artistic Design (Video Game Design), Northeastern University, China

Appointments

- 11/2020 – Present Assistant Professor, Computer Science, Eastern Kentucky University
- 08/2016 – 05/2020 Graduate Research/Teaching Assistant, University of Kentucky
- 08/2013 – 05/2016 Graduate Teaching Assistant, Western Kentucky University
- 09/2012 – 12/2012 Intern, Folklife and Folk Music, Houston Arts Alliance
- 09/2008 – 08/2009 Lecture, Shenyang Technicians College, Shenyang, LN, China
- 07/2007 – 09/2008 Assistant 3D Model Designer, Hima Technology Co., Shenyang, LN, China

Publications

Refereed Journals

- [1] Y. Su, Y. Zhang, **Gongbo Liang**, J. ZuHone, D. Barnes, N. Jacobs, M. Ntampaka et al. “A Deep Learning View of the Census of Galaxy Clusters in IllustrisTNG.” *Monthly Notices of the Royal Astronomical Society*. (2020). Oxford University Press. Impact Factor: 5.356 (2019). DOI: [10.1093/mnras/staa2690](https://doi.org/10.1093/mnras/staa2690)
- [2] T. Hammond, X. Xing, C. Wang, D. Ma, K. Nho, P. Crane, F. Elahi, D. Ziegler, **Gongbo Liang**, Q. Cheng, L. Yanckello, N. Jacobs, A. Lin. “ β -Amyloid and Tau Drive Early Alzheimer’s Disease

Decline While Glucose Hypometabolism Drives Late Decline.” *Communications Biology* 3, no. 1 (2020): 1-13. Nature Research. DOI: [10.1038/s42003-020-1079-x](https://doi.org/10.1038/s42003-020-1079-x)

- [3] X. Wang, **Gongbo Liang**, Y. Zhang, H. Blanton, Z. Bessinger, and N. Jacobs. “Inconsistent Performance of Deep Learning Models on Mammogram Classification.” *Journal of the American College of Radiology* 17, no. 6 (2020): 796-803. Elsevier. Impact Factor: 4.268 (2019). DOI: [10.1016/j.jacr.2020.01.006](https://doi.org/10.1016/j.jacr.2020.01.006)
- [4] R. Mihail, **Gongbo Liang**, N. Jacobs. “Automatic Hand Skeletal Shape Estimation from Radiographs.” *IEEE Transactions on NanoBioscience* 18, no. 3 (2019): 296-305. IEEE. Impact Factor: 2.791 (2019). DOI: [10.1109/TNB.2019.2911026](https://doi.org/10.1109/TNB.2019.2911026)

Refereed Conferences

- [1] Y. Zhang, **Gongbo Liang**, Y. Su, and N. Jacobs. “Parametric Attention for Sparse Image Classification.” In *25th International Conference on Pattern Recognition (ICPR)*, 2020. Milan, Italy. Acceptance Rate: 28.47% DOI: [Available soon](#)
- [2] **Gongbo Liang**, Y. Zhang, X. Wang, and N. Jacobs . “Improved Trainable Calibration Method for Neural Networks on Medical Imaging Classification.” In *2020 31st British Machine Vision Conference, BMVC*, 2020. Manchester, England. Acceptance Rate: 29.10% DOI: [BMVC-2020/0059](https://doi.org/10.1109/BMVC-2020/0059)
- [3] **Gongbo Liang**, X. Wang, Y. Zhang, and N. Jacobs. “Weakly-Supervised Self-Training Breast Cancer Localization.” In *2020 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, pp. 1124-1127. IEEE, 2020. Montréal, Canada. DOI: [10.1109/EMBC44109.2020.9176617](https://doi.org/10.1109/EMBC44109.2020.9176617)
- [4] Y. Zhang, **Gongbo Liang**, T. Salem, and N. Jacobs. “Defense-PointNet: Protecting PointNet Against Adversarial Attacks.” In *2019 IEEE International Conference on Big Data (Big Data)*, pp. 5654-5660. IEEE, 2019. Los Angeles, USA. DOI: [10.1109/BigData47090.2019.9006307](https://doi.org/10.1109/BigData47090.2019.9006307)
- [5] **Gongbo Liang**, X. Wang, Y. Zhang, X. Xing, H. Blanton, T. Salem, and N. Jacobs. “Joint 2D-3D Breast Cancer Classification.” In *2019 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, pp. 692-696. IEEE, 2019. San Diego, USA. DOI: [10.1109/BIBM47256.2019.8983048](https://doi.org/10.1109/BIBM47256.2019.8983048)
- [6] Y. Zhang, X. Wang, H. Blanton, **Gongbo Liang**, X. Xing, and N. Jacobs. “2D Convolutional Neural Networks for 3D Digital Breast Tomosynthesis Classification.” In *2019 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, pp. 1013-1017. IEEE, 2019. San Diego, USA. DOI: [10.1109/BIBM47256.2019.8983097](https://doi.org/10.1109/BIBM47256.2019.8983097)
- [7] **Gongbo Liang**, S. Fouladvand, J. Zhang, M. Brooks, N. Jacobs, J. Chen. “GANai: Standardizing CT Images using Generative Adversarial Network with Alternative Improvement.” In *2019 IEEE International Conference on Healthcare Informatics (ICHI)*, pp. 1-11. IEEE, 2019. Shenzhen, China. Acceptance Rate: 28%. DOI: [10.1101/460188](https://doi.org/10.1101/460188)
- [8] **Gongbo Liang**, Q. Li, and X. Kang. “Pedestrian detection via a leg-driven physiology framework.” In *IEEE International Conference on Image Processing (ICIP)*, pp. 2926-2930. IEEE, 2016. Phoenix, USA. DOI: [10.1109/ICIP.2016.7532895](https://doi.org/10.1109/ICIP.2016.7532895)
- [9] Q. Li, **Gongbo Liang**, and Y. Gong. “A geometric framework for stop sign detection.” In *IEEE China Summit and International Conference on Signal and Information Processing (ChinaSIP)*,

Refereed Workshops

- [1] **Gongbo Liang**, S. Lin, Y. Zhang, Y. Su, and N. Jacobs . “Optical Wavelength Guided Feature Learning for Galaxy Group Richness Estimation.” In *Thirty-fourth Conference on Neural Information Processing Systems (NeurIPS) Workshop on Machine Learning and the Physical Sciences*, 2020. Vancouver, Canada. DOI: [Available soon](#)
- [2] **Gongbo Liang**, Y. Zhang, and N. Jacobs. “Neural Network Calibration for Medical Imaging Classification Using DCA Regularization.” In *2020 International Conference on Machine Learning (ICML) Workshop on Uncertainty & Robustness in Deep Learning*, 2020. Vienna, Austria. DOI: [ICML2020/UDL2020-paper-137](#)
- [3] X. Xing*, **Gongbo Liang***, H. Blanton, M. Rafique, C. Wang, A. Lin, and N. Jacobs. “Dynamic Image for 3D MRI Image Alzheimer’s Disease Classification.” In *2020 the European Conference on Computer Vision (ECCV) Workshop on BioImage Computing*, 2020. Glasgow, United Kingdom. DOI: [Available soon](#)

Refereed Abstracts

- [1] **Gongbo Liang**, N. Jacobs, and X. Wang. “Training Deep Learning Models as Radiologists: Breast Cancer Classification Using Combined Whole 2D Mammography and Full Volume Digital Breast Tomosynthesis.” In *105th Scientific Assembly and Annual Meeting of the Radiological Society of North America (RSNA)*. Chicago, IL, Dec 2019. Oral Presentation. Acceptance Rate: ~25%.
- [2] Y. Zhang, **Gongbo Liang**, N. Jacobs, and X. Wang. “Unsupervised Domain Adaptation for Mammogram Image Classification: A Promising Tool for Model Generalization.” In *4th Annual Scientific Conference on Machine Intelligence in Medical Imaging(C-MIMI) of the Society for Imaging Informatics in Medicine (SIIM)*. Austin, TX, Sep 2019. Oral Presentation.
- [3] **Gongbo Liang**, N. Jacobs, and X. Wang. “Breast Cancer Classification Using Combined Whole Mammography and Digital Breast Tomosynthesis.” In *2019 Markey Cancer Center Research Day*. Lexington, KY, May 2019. Poster presentation. Award poster.
- [4] **Gongbo Liang**, X. Wang, and N. Jacobs. “Evaluating the Publicly Available Mammography Datasets for Deep Learning Model Training.” In *2019 SBI/ACR Breast Imaging Symposium*. Hollywood, FL, Apr 2019. E-poster presentation.
- [5] **Gongbo Liang**, J. Zhang, M. Brooks, J. Howard, and J. Chen. “Enhancing Radiomic Features of CT Images using Generative Adversarial Network with Alternative Improvement.” In *AMIA 2018 Annual Symposium*. San Francisco, CA, Nov 2018. Poster presentation. Acceptance Rate: ~22%.
- [6] **Gongbo Liang**, J. Zhang, M. Brooks, J. Howard, and J. Chen. “Radiomic Features of Lung Cancer and Their Dependency On Ct Image Acquisition Parameters.” In *59th Annual Meeting and Exhibition of American Association of Physicists in Medicine (AAPM)*. Denver, CO, Jul 2017. Oral presentation.

*Co-first author

- [7] **Gongbo Liang**, J. Zhang, M. Brooks, J. Howard, and J. Chen. “Do Lung Tumor Image Features Depend on CT Acquisition Parameters.” In *American Association of Physicists in Medicine (AAPM) Ohio River Valley Spring Educational Symposium*. Lexington, KY, April 2017. Oral presentation.

Under Review

- [1] **Gongbo Liang**, C. Greenwell, Y. Zhang, X. Xing, X. Wang, R. Kavuluru, and N. Jacobs . “Weakly-Supervised Feature Learning via Text and Image Matching.” Submitted to *IEEE Journal of Biomedical and Health Informatics*.
- [2] X. Xing, **Gongbo Liang**, A. Lin, N. Jacobs, et al. “Alzheimer’s Disease Classification Using Dynamic Image Techniques.” Submitted to *Scientific Reports*.

Under Preparation

- [1] **Gongbo Liang**, X. Xing, A. Lin, and N. Jacobs. “Alzheimer’s Disease Classification Using 2D Convolutional Neural Networks.”
- [2] S. Lin, **Gongbo Liang**, Y. Su, Y. Zhang, N. Jacobs, M. Ntampaka, et al. “End-to-End Dark Matter Halos Mass Estimation via Deep Neural Network.”

Teaching

Courses

CSC 316	3D Game Enging Design	Spring 2021
CS 275 Lab	Discrete Mathematics	Fall 2019
CS 221 Lab	First Course in Computer Science for Engineers	Fall 2016, Spring 2017

Advising/Mentoring

David Yan	Undergraduate Student, University of Kentucky	Fall 2020 – Present
Subash Khanal	Junior Ph.D. Student, University of Kentucky	Summer 2020
Xin Xing	Junior Ph.D. Student, University of Kentucky	Spring 2019 – Spring 2020
Yu Zhang	Junior Ph.D. Student, University of Kentucky	Fall 2018 – Spring 2020
Yuhang Long	REU Student, University of Kentucky	Summer 2019
Nathan Robinson	CS Research Program, B.G. High School	Fall 2015
Travis Harder	CS Research Program, B.G. High School	Fall 2015
Elissa Booras	CS Research Program, B.G. High School	Fall 2015

Honors & Awards

Apr 2020	Outstanding Ph.D. Student, Computer Science Department, University of Kentucky
Mar 2020	One journal article was featured in “Inconsistent AI: Deep learning models for breast cancer fail to deliver after closer inspection” by Michael Walter, AI in Healthcare
Nov 2019	One research project was mentioned in “RSNA 2019 to offer a look at progress of AI and DBT” by Louise Gagnon, AuntMinnie.com
Oct 2019	Travel Grant, Multimodal Vision Research Laboratory, Computer Science Department & Radiology Department University of Kentucky, \$2,800
May 2019	Markey Cancer Center Research Day Second Place Awarded Poster Title: Breast Cancer Classification Using Combined Whole Mammography and Digital Breast Tomosynthesis
Sep 2016	Travel Grant, Computer Science Department, University of Kentucky, \$700
Apr 2016	WKU Student Research Conference Best Graduate Student Oral Paper Award in the Natural Sciences Category Title: Pedestrian Detection Using Line Segments
May 2012	Robert J. Wurster Scholarship

Professional Activities

Reviewer

Since 2020	IEEE Transactions on Geoscience and Remote Sensing (TGRS)
Since 2019	IEEE Winter Conference on Applications of Computer Vision (WACV)
Since 2018	American Medical Informatics Association (AMIA) Annual Symposium
Since 2017	IEEE/ACM Transactions on Computational Biology and Bioinformatics (TCBB)
2020	International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)
2019	Journal of Applied Clinical Medical Physics (JACMP)
2018	Journal of Bioinformatics and Computational Biology
2016, 2018	Neurocomputing

Memberships

Since 2016 Member of IEEE
Since 2016 Member of IEEE Young Professionals
Since 2020 Member of IEEE Engineering in Medicine and Biology Society

Collaborators

Dr. Nathan Jacobs, University of Kentucky (PhD Advisor)
Dr. Yuanyuan Su, University of Kentucky (Mentor)
Dr. Xiaoqin Wang, University of Kentucky (Mentor)
Dr. Ramakanth Kavuluru, University of Kentucky
Dr. Yuanyuan Zhang, Fermi National Accelerator Laboratory
Dr. Michelle Ntampaka, Space Telescope Science Institute
Dr. Tawfiq Salem, Purdue University
Dr. Zach Bessinger, Zillow Group, Inc.

References

Available on request.