

# Riqiang Gao, Ph.D.

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## Research Interest

2015–now 📌 I am interested in artificial intelligence, especially its applications in healthcare. My dream is to develop “gentle-and-strict” models that are 1) easy to implement and user-friendly (*gentle*), and 2) motivated by practical challenges and theoretically solid (*strict*).<sup>1</sup>

## Research Experiences

- 04/2022 – now 📌 Senior AI Scientist, *Deep Reinforcement Learning/Deep Learning for Healthcare*, Siemens Healthineers
- 08/2018 – 03/2022 📌 Research Assistant, *Lung Cancer Risk Estimation*, Vanderbilt University, Advisor: Prof. Bennett Landman
- 05/2021 – 09/2021 📌 Research Intern, *Anomaly Detection with Generative Models*, Siemens Healthineers, Mentor: Dr. Zhoubing Xu
- 09/2015 – 05/2018 📌 Research Assistant, *Face Recognition and Computer Vision*, Tsinghua University
- 03/2018 – 06/2018 📌 Research Intern, *Whole Slide Image Analysis*, Imsight Technology
- 06/2017 – 09/2017 📌 Research Intern, *Clothes Detection*, YouTu X-Lab of Tencent

## Education



Degree	Major	University	Period	GPA rank
Ph.D.	Computer Sci.	Vanderbilt University	08/2018 - 03/2022	N/A
M.E.	Electronics Eng.	Tsinghua University	09/2015 - 07/2018	2 / 54
B.E.	Communication Eng.	Central South University	09/2011 - 07/2015	2 / 163

## Selected Honors & Awards

- 2023 📌 500 Point-based Reward in Siemens Healthineers (personal reward)
- 2021 📌 MICCAI Traveling Award (first-author)  
📌 C.F. Chen Best Paper Award (with 5,000 USD), Vanderbilt University (first-author)  
📌 RFW Best Student Paper Award Finalist, SPIE-MI 2021 (first-author) (< 2%)
- 2020 📌 RFW Best Student Paper Award Finalist, SPIE-MI 2020 (first-author) (< 2%)  
📌 Honorable Mention Poster Award, SPIE-MI 2020 (Mentor & Presenter) (< 5%)
- 2015 📌 Member of Outstanding Deeds Report (10 selected across all majors, < 0.5%)  
📌 Outstanding Graduate in Hunan Province, China (2%)
- 2014 📌 Meritorious in Mathematical Contest in Modeling of USA (team-leader) (10%)  
📌 Pacemaker to Merit Student of CSU (30 selected across all majors, < 0.5%)

<sup>1</sup>this resume is updated at 04/2023

## Selected Honors & Awards (continued)

- 2013      First Prize in National Mathematics Competitions (not-math-major) of China (Rank 17 in China, Rank 1 in Hunan Province, <0.02%)
- 2012 – now      Scholarships including Outstanding Scholarship (CSU, <1%), National Scholarship (CSU, <2%), First Prize Scholarship (THU, 10%), Dean's Graduate Fellowship (VU).

## Selected Publications (Contact Author \*)

### Journal Articles

- 1     Tang, Y., **Gao, Riqiang**, Han, S., Chen, Y., Gao, D., Nath, V., Bermudez, C., Savona, M. R., Bao, S., Lyu, I. Et al. (n.d.). Body part regression with self-supervision. *IEEE Transactions on Medical Imaging*.
- 2     **Gao, Riqiang**, Li, T., Tang, Y., Xu, K., Khan, M., Kammer, M., Antic, S. L., Deppen, S., Huo, Y., Lasko, T. A. Et al. (2022). Reducing uncertainty in cancer risk estimation for patients with indeterminate pulmonary nodules using an integrated deep learning model. *Computers in Biology and Medicine*.
- 3     **Gao, Riqiang**, Tang, Y., Khan, M. S., Xu, K., Paulson, A. B., Sullivan, S., Huo, Y., Deppen, S., Massion, P. P., Sandler, K. L., & Landman, B. A. (2021). Cancer risk estimation combining lung screening ct with clinical data elements. *Radiology: Artificial Intelligence*.
- 4     **Gao, Riqiang**, Huo, Y., Bao, S., Tang, Y., Antic, S. L., Epstein, E. S., Deppen, S., Paulson, A. B., Sandler, K. L., Massion, P. P., & Landman, B. A. (2020). Multi-path xd recurrent neural networks for collaborative image classification. *Neurocomputing*.
- 5     **Gao, Riqiang**, Tang, Y., Xu, K., Huo, Y., Bao, S., Antic, S. L., Epstein, E. S., Deppen, S., Paulson, A. B., Sandler, K. L., Massion, P. P., & Landman, B. A. (2020). Time-distanced gates in long short-term memory networks. *Medical Image Analysis (C.F. Chen best paper (VU))*.
- 6     **Gao, Riqiang**, Yang, F., Yang, W., & Liao, Q. (2018). Margin loss: Making faces more separable. *IEEE Signal Processing Letters*, 25(2), 308–312.
- 7     Yang, F., Yang, W., **Gao, Riqiang**, & Liao, Q. (2017). Discriminative multidimensional scaling for low-resolution face recognition. *IEEE Signal Processing Letters*, 25(3), 388–392.
- 8     Yang, W., **Gao, Riqiang** \*, & Liao, Q. (2017). Weighted voting of discriminative regions for face recognition. *IEICE TRANSACTIONS on Information and Systems*, 100(11), 2734–2737.
- 9     Tang, Y., **Gao, Riqiang**, Han, S., Chen, Y., Gao, D., Nath, V., Bermudez, C., Savona, M. R., Abramson, R. G., Bao, I., Shunxing Lyu, Huo, Y., & Landman, B. A. (2020a). High-resolution 3d abdominal segmentation with random patch network fusion. *Medical Image Analysis*.

### Conference Proceedings

- 1     **Gao, Riqiang**, Lou, B., Xu, Z., Comaniciu, D., & Kamen, A. (2023). Flexible- $c^m$  gan: Towards precise 3d dose prediction in radiotherapy, In *Ieee/cvf conference on computer vision and pattern recognition*.
- 2     **Gao, Riqiang**, Xu, Z., Chabin, G., Mansoor, A., Ghesu, F.-C., Georgescu, B., Landman, B. A., & Grbic, S. (2022). You may need both good-gan and bad-gan for anomaly detection, In *Openreview*.
- 3     Tang, Y., **Gao, Riqiang**, Lee, H., Yang, Q., Yu, X., Zhou, Y., Bao, S., Huo, Y., Spraggins, J., Virostko, J. Et al. (2021). Pancreas ct segmentation by predictive phenotyping, In *International conference on medical image computing and computer-assisted intervention*. Springer.
- 4     **Gao, Riqiang**, Tang, Y., Xu, K., Kammer, M. N., Antic, S. L., Deppen, S., Sandler, K. L., Massion, P. P., Huo, Y., & Landman, B. A. (2021). Deep multi-path network integrating incomplete biomarker and chest ct data for evaluating lung cancer risk, In *Medical imaging: Image processing*. SPIE (**RFW all-conference best paper finalist**).

- 5 **Gao, Riqiang**, Tang, Y., Xu, K., Lee, H. H., Deppen, S., Sandler, K., Massion, P., Lasko, T. A., Huo, Y., & Landman, B. A. (2021). Lung cancer risk estimation with incomplete data: A joint missing imputation perspective, In *International conference on medical image computing and computer-assisted intervention*. (early accepted & travel award).
- 6 **Gao, Riqiang**, Li, L., Tang, Y., Antic, S. L., Paulson, A. B., Huo, Y., Sandler, K. L., Massion, P. P., & Landman, B. A. (2020). Deep multi-task prediction of lung cancer and cancer-free progression from censored heterogenous clinical imaging, In *Medical imaging: Image processing*. SPIE (RFW all-conference best paper finalist).
- 7 Yang, Y., **Gao, Riqiang \***, Tang, Y., Antic, S. L., Deppen, S., Huo, Y., Sandler, K. L., Massion, P. P., & Landman, B. A. (2020). Internal-transfer weighting of multi-task learning for lung cancer detection, In *Medical imaging: Image processing*. SPIE (Honorable Mentioned Poster, \* denotes Mentor).
- 8 **Gao, Riqiang**, Huo, Y., Bao, S., Tang, Y., Antic, S. L., Epstein, E. S., Balar, A. B., Deppen, S., Paulson, A. B., Sandler, K. L. Et al. (2019). Distanced lstm: Time-distanced gates in long short-term memory models for lung cancer detection. MICCAI-MLMI (oral).
- 9 **Gao, Riqiang**, Yang, W., Hu, X., & Liao, Q. (2016). Two-stage patch-based sparse multi-value descriptor for face recognition, In *Visual communications and image processing (vcip)*, IEEE.
- 10 Yang, W., **Gao, Riqiang \***, Xu, Y., Sun, X., & Liao, Q. (2016). Discriminative patch-based sparse representation for face recognition, In *Ieee international conference on signal processing, communications and computing (icspcc)*. IEEE.
- 11 **Gao, Riqiang**, Yang, W., Sun, X., Li, H., & Liao, Q. (2015). Locally collaborative representation in similar subspace for face recognition, In *Chinese conference on biometric recognition*. Springer.

## Mentored Students in Vanderbilt

01/2020 - 05/2020	■ Qingyun Qian (master). First Job: Engineer in Huawei.
01/2019 - 06/2019	■ Yiyuan Yang (bachelor). First Job: Engineer in Facebook.
07/2019 - 09/2019	■ Lingfeng Li (bachelor). First Job: MS student in Northwestern University.
01/2020 - 05/2020	■ Xinmeng Zhang (bachelor). First Job: Ph.D. student in Vanderbilt University.

## Academic Activities

Program Committee	■ ICLR 2023 Workshop on Trustworthy Machine Learning for Healthcare ICCV2021 Workshop on Computer Vision for Automated Medical Diagnosis ICML 2021 Workshop Interpretable ML in Healthcare
Reviewer	■ Transactions on Medical Imaging (TMI) Medical Image Computing and Computer Assisted Intervention (MICCAI) Journal of Biomedical and Health Informatics (JBHI) Computer Methods and Programs in Biomedicine (CMPB) PLOS One Research in Computational Molecular Biology (RECOMB) Cancers (co-reviewed with Dr. Pierre Massion) Medical Physics Frontiers in Oncology European Radiology Contrast Media and Molecular Imaging