

# 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

## Industrial Management Experiences

- 10/2023 – now    📌 Project Manager, *Automated AI Planning - RapidPlan 3D Modules*, Siemens Healthineers
- 📌 Project Manager, *Automated AI Planning - RL optimization*, Siemens Healthineers
- 08/2023 – 11/2023    📌 Project Manager, *EzE Automated AI Planning with Front End*, Siemens Healthineers
- 04/2023 – 09/2023    📌 Project Manager, *Automated AI Planning- Accelerated Dose and Leap Sequencing Modules*, Siemens Healthineers

## Education











Degree	Major	University	Period	GPA rank	GPA+award
Ph.D.	Computer Sci.	Vanderbilt Univ.	08/2018 - 03/2022	N/A	N/A
M.E.	Electronics Eng.	Tsinghua Univ.	09/2015 - 07/2018	2 / 54	N/A
B.E.	Communi. Eng.	Central South Univ.	09/2011 - 07/2015	2 / 163	1 / 163

## Selected Honors & Awards

- 2024    📌 Innovation Excellence Award at Siemens Healthineers (first-author)
- 2021    📌 MICCAI Traveling Award, now STAR Award (first-author)

<sup>1</sup>this resume is updated at 12/2024

## Selected Honors & Awards (continued)

	<ul style="list-style-type: none"> <li>  C.F. Chen Best Paper Award (with 5,000 USD), Vanderbilt University (first-author) </li> <li>  RFW Best Student Paper Award Finalist, SPIE-MI 2021 (first-author) (&lt; 2%) </li> </ul>
2020	<ul style="list-style-type: none"> <li>  RFW Best Student Paper Award Finalist, SPIE-MI 2020 (first-author) (&lt; 2%) </li> <li>  Honorable Mention Poster Award, SPIE-MI 2020 (Mentor &amp; Presenter) (&lt; 5%) </li> </ul>
2015	<ul style="list-style-type: none"> <li>  Member of Outstanding Deeds Report (10 selected across all majors, &lt; 0.5%) </li> <li>  Outstanding Graduate in Hunan Province, China (2%) </li> </ul>
2014	<ul style="list-style-type: none"> <li>  Meritorious in Mathematical Contest in Modeling of USA (team-leader) (10%) </li> <li>  Pacemaker to Merit Student of CSU ( 30 selected across all majors, &lt; 0.5%) </li> </ul>
2013	<ul style="list-style-type: none"> <li>  First Prize in National Mathematics Competitions (not-math-major) of China (Rank 17 in China, Rank 1 in Hunan Province, &lt;0.02%) </li> </ul>
2012 – 2022	<ul style="list-style-type: none"> <li>  10+ Scholarships including Outstanding Scholarship (CSU, &lt;1%), National Scholarship (CSU, &lt; 2%), First Prize Scholarship (THU, 10%), Dean's Graduate Fellowship (VU). </li> </ul>

## Selected Publications (Contact Author \*)

### Journal Articles

- 1 Liu, H., Xu, Z., **Gao, Riqiang**, Li, H., Wang, J., Chabin, G., Oguz, I., & Grbic, S. (2024). Cosst: Multi-organ segmentation with partially labeled datasets using comprehensive supervisions and self-training. *IEEE Transactions on Medical Imaging*.
- 2 Li, T. Z., Hin Lee, H., Xu, K., **Gao, Riqiang**, Dawant, B. M., Maldonado, F., Sandler, K. L., & Landman, B. A. (2023). Quantifying emphysema in lung screening computed tomography with robust automated lobe segmentation. *Journal of Medical Imaging*.
- 3 Xu, K., Khan, S. M., Li, T., **Gao, Riqiang** Et al. (2023). Ai body composition in lung cancer screening: Added value beyond lung cancer detection. *Radiology*.
- 4 Xu, K., Li, T., Khan, M. S., **Gao, Riqiang**, Antic, S. L., Huo, Y., Sandler, K. L., Maldonado, F., & Landman, B. A. (2023). Body composition assessment with limited field-of-view computed tomography: A semantic image extension perspective. *Medical Image Analysis*.
- 5 Yu, X., Yang, Q., Zhou, Y., Cai, L. Y., **Gao, Riqiang**, Lee, H. H., Li, T., Bao, S., Xu, Z., Lasko, T. A. Et al. (2023). Unest: Local spatial representation learning with hierarchical transformer for efficient medical segmentation. *Medical Image Analysis*.
- 6 **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*.
- 7 Tang, Y., **Gao, Riqiang**, Han, S., Chen, Y., Gao, D., Nath, V., Bermudez, C., Savona, M. R., Bao, S., Lyu, I. Et al. (2021). Body part regression with self-supervision. *IEEE Transactions on Medical Imaging*.
- 8 **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*.
- 9 **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*.
- 10 **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))*.

- 11 **Gao, Riqiang**, Yang, F., Yang, W., & Liao, Q. (2018). Margin loss: Making faces more separable. *IEEE Signal Processing Letters*, 25(2), 308–312.
- 12 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.
- 13 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.
- 14 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**, Ghesu, F.-C., Arberet, S., Basiri, S., Kuusela, E., Kraus, M., Comaniciu, D., & Kamen, A. (2024). Multi-agent reinforcement learning meets leaf sequencing in radiotherapy, In *International conference on machine learning*.
- 2 Li, T. Z., Still, J. M., Xu, K., Lee, H. H., Cai, L. Y., Krishnan, A. R., **Gao, Riqiang**, Khan, M. S., Antic, S., Kammer, M. Et al. (2023). Longitudinal multimodal transformer integrating imaging and latent clinical signatures from routine ehers for pulmonary nodule classification, In *International conference on medical image computing and computer-assisted intervention*.
- 3 **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*.
- 4 **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*.
- 5 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.
- 6 **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**).
- 7 **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**).
- 8 **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**).
- 9 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**).
- 10 **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)*.
- 11 **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.

- 12 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.
- 13 **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.

## Officially Mentored Interns in Industry

05/2024 - 09/2024    Thomas Li, MD.-Ph.D. candidate at Vanderbilt University, research intern at Siemens Healthineers

## Officially Mentored Students at 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 (not actively updated)

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) x 2  
 Medical Image Computing and Computer Assisted Intervention (MICCAI) x 5  
 Journal of Biomedical and Health Informatics (JBHI) x 8  
 Computer Methods and Programs in Biomedicine (CMPB) x 1  
 PLOS One x 3  
 Research in Computational Molecular Biology (RECOMB) x 2  
 Cancers (co-reviewed with Dr. Pierre Massion) x 1  
 Medical Physics x 2  
 Frontiers in Oncology x 1  
 European Radiology x 1  
 Contrast Media and Molecular Imaging x 1  
 Journal of Medical Imaging x 1