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*). [1]

Research Experiences

- 01/2025 – now Staff AI Scientist, *Deep (Reinforcement) Learning for Healthcare, Radiotherapy Planning*, Siemens Healthineers
- 04/2022 – 12/2024 Senior AI Scientist, *Deep (Reinforcement) Learning for Healthcare, Radiotherapy Planning*, 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*, Siemens Healthineers
- Project Manager, *Automated AI Planning - RL optimization*, Siemens Healthineers
- 08/2023 – 11/2023 Project Manager, *E2E Auto AI Planning with Front End*, Siemens Healthineers
- 04/2023 – 09/2023 Project Manager, *Automated AI Planning- Accelerated Dose and Leaf 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

- 2025 1st Winner Team of PANORAMA Challenge
- 2024 Innovation Excellence Award at Siemens Healthineers (first-author)
- 2021 MICCAI Traveling Award, now STAR Award (first-author)
- C.F. Chen Best Paper Award (with 5,000 USD), Vanderbilt University (first-author)

[1] this resume is updated at 03/2025

Selected Honors & Awards (continued)

	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%)
2013	First Prize in National Mathematics Competitions (not-math-major) of China (Rank 17 in China, Rank 1 in Hunan Province, <0.02%)
2012 – 2022	10+ Scholarships including Outstanding Scholarship (CSU, <1%), National Scholarship (CSU, < 2%), First Prize Scholarship (THU, 10%), Dean's Graduate Fellowship (VU).

Selected Publications (Contact Author *)

1. Arberet, S., Ghesu, F. C., **Gao, Riqiang**, Kraus, M., Sackett, J., Kuusela, E., & Kamen, A. (2025). A beam eye view to fluence maps 3d network for ultra fast vmat radiotherapy planning. *Medical Physics*.
2. **Gao, Riqiang**, Diallo, M., Liu, H., Magliari, A., Sackett, J., Verbakel, W., Meyers, S., Zarepisheh, M., Mcbeth, R., Arberet, S., Kraus, M., Ghesu, F. C., & Kamen, A. (2025). Automating high quality rt planning at scale. *arXiv preprint arXiv:2501.11803*.
3. 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*.
4. **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*.
5. 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*.
6. 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 ehrs for pulmonary nodule classification, In *International conference on medical image computing and computer-assisted intervention*.
7. **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*.
8. 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*.
9. 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*.
10. 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*.

11 **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*.

12 **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 *Technique report (not peer-reviewed publication)*.

13 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*.

14 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.

15 **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*.

16 **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)**.

17 **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)**.

18 **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*.

19 **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)**.

20 **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))***.

21 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)**.

22 **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)**.

23 **Gao, Riqiang**, Yang, F., Yang, W., & Liao, Q. (2018). Margin loss: Making faces more separable. *IEEE Signal Processing Letters*, *25*(2), 308–312.

24 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.

25 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.

26 **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.

27 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.

28 **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.

29 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*.

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)

Lead Organizer
- GDP-HMM Grand Challenge at AAPM 2025

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