

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

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)

📌 RFW Best Student Paper Award Finalist, SPIE-MI 2021 (first-author) (< 2%)

¹this resume is updated at 01/2025

Selected Honors & Awards (continued)

- 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 ehers 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