

Kai Wang, Ph.D.

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PROFESSIONAL EXPERIENCE

University of Colorado Anschutz Medical Campus (**CU Anschutz**), Aurora, CO 07/2025-Present
Assistant Professor (Tenure Track) at the Department of Radiation Oncology

EDUCATION AND TRAINING

University of Maryland Medical Center (UMMC), Baltimore, MD 07/2023-06/2025
Medical Physics Resident at Department of Radiation Oncology

Medical Physics Residency Training (CAMPEP Accredited)

University of Texas Southwestern Medical Center (UTSW), Dallas, TX 09/2018-05/2023
Graduate School of Biomedical Sciences

Ph.D. in Biomedical Engineering Medical Physics (CAMPEP Accredited)

Xi'an Jiaotong University (XJTU), Xi'an, China
School of Electronic and Information Engineering 09/2015-06/2018

M.S. in Electrical Engineering, specialized in *Information and Communication Engineering*

School of Electronic and Information Engineering 09/2011-06/2015

B.S. in Electrical Engineering, specialized in *Information Engineering*

CERTIFICATION

American Board of Radiology, Medical Physics Part II 2025

American Board of Radiology, Medical Physics Part I 2023

PROFESSIONAL SOCIETY MEMBERSHIP

General Member, American Association of Physicists in Medicine 2018-Present

General Member, The International Society for Optics and Photonics 2015-Present

HONORS AND AWARDS

- AAPM Mid-Atlantic Annual Meeting Young Investigator Award 2023
- Head & Neck Tumor Segmentation and Outcome Prediction Challenge (HECKTOR) at MICCAI 2022, *Third Place* for both Segmentation and Prediction tasks *out of 121 Teams* 2022
- Excellent Graduate Student, XJTU 2016-2017
- Outstanding Undergraduate Student Cadres, XJTU 2015
- Siyuan Scholarship, XJTU 2012-2015
- Special Award in "TI Cup" Circuit Design Competition, Shaanxi, China 2014
- First Prize in Undergraduate Mathematical Contest in Modeling, Shaanxi, China 2013

TEACHING AND MENTORSHIP

- Physics Course for Residents, CU Anschutz 08/2025-Present
- Senior Medical Physics Resident, UMMC 07/2024-06/2025
- Electronic Design Contest Student Instructor, XJTU 2015

EDITORIAL ACTIVITIES

Associate Editor

- Medical Physics 2024-Present

Journal and Conference Reviewer

- IEEE Journal of Biomedical and Health Informatics 2023-Present
- International Journal of Radiation Oncology* Biology* Physics 2022-Present
- The British Journal of Radiology 2022-Present
- Biomedical Physics & Engineering Express 2022-Present
- Scientific Reports 2021-Present
- Physics in Medicine and Biology 2020-Present
- Medical Physics 2020-Present

JOURNAL PAPERS

1. Wang, R., Chen, J., Zhang, X., Liu, H., Zhou, Z., **Wang, K.**, ... & Wang, J. (2025). Language-guided multimodal domain generalization for outcome prediction of head and neck cancer. *Computers in Biology and Medicine*, 197, 110992.
2. Li, Y., Chen, M., **Wang, K.**, Ma, J., Bovik, A. C., & Zhang, Y. (2025). SAMScore: A Content Structural Similarity Metric for Image Translation Evaluation. *IEEE Transactions on Artificial Intelligence*.
3. Tang, S., Yen, A., **Wang, K.**, Albuquerque, K. and Wang, J., 2024. Progression-Free Survival Prediction for Locally Advanced Cervical Cancer after Chemoradiotherapy with MRI-based Radiomics. *Clinical Oncology*, p.103702.
4. Tang, S., **Wang, K.**, Hein, D., Lin, G., Sanford, N.N. and Wang, J., 2024. Recurrence-Free Survival Prediction for Anal Squamous Cell Carcinoma After Chemoradiotherapy using Planning CT-based Radiomics Model. *British Journal of Radiology*, p.tqae235.
5. Chen, M., **Wang, K.**, Dohopolski, M., Morgan, H., Sher, D. and Wang, J. (2024). TransAnaNet: Transformer-based Anatomy Change Prediction Network for Head and Neck Cancer Patient Radiotherapy. Accepted by Medical Physics.
6. Wang, R., Ma, Z., Wang, J., **Wang, K.**, Liu, H., Zhou, Z., and Jiao, L. (2024). ASF-LKUNet: Adjacent-Scale Fusion U-Net with Large-kernel for Medical Image Segmentation. *Computers in Biology and Medicine*.
7. Jing, B., **Wang, K.**, Schmitz, E., Tang, S., Li, Y., You, Z., and Wang, J. (2024). Prediction of pathological complete response to neoadjuvant chemotherapy for breast cancer in I-SPY2 trial using deep neural network with uncertainty quantification. Accepted by Medical Physics.
8. **Wang, K.***, Karalis, J.D.*, Elamir, A.*, Bifulco, A., Wachsmann, M., Capretti, G., Spaggiari, P., Enrico, S., Balasubramanian, K., Fatimah, N. and Pontecorvi, G. (2024). Delta radiomic features predict resection margin status and overall survival in neoadjuvant-treated pancreatic cancer patients. *Annals of surgical oncology*, 31(4), pp.2608-2620.

9. Chen, M., **Wang, K.** and Wang, J., 2024. Vision Transformer-Based Multilabel Survival Prediction for Oropharynx Cancer After Radiation Therapy. *International Journal of Radiation Oncology* Biology* Physics*, 118(4), pp.1123-1134.
10. Li R, Zhuang T, Montalvo S, **Wang K.**, Parsons D, Zhang Y, Iyengar P, Wang J, Godley A, Cai B, Lin MH. Adapt-On-Demand: A Novel Strategy for Personalized Adaptive Radiation Therapy for Locally Advanced Lung Cancer. *Practical Radiation Oncology*. (2024)
11. **Wang, K.**, Dohopolski, M., Zhang, Q., Sher, D. and Wang, J., (2023). Towards reliable head and neck cancers locoregional recurrence prediction using delta - radiomics and learning with rejection option. *Medical physics*, 50(4), pp.2212-2223.
12. **Wang, K.**, Chen, L., George-Jones, N., Hunter, J., Wang, J. (2022). Joint Vestibular Schwannoma Enlargement Prediction and Segmentation Using a Deep Multi-task Model. *The Laryngoscope*.
13. Zhang, Q.*, **Wang, K.***, Zhou, Z., Qin, G., Wang, L., Li, P., Sher, D., Jiang, S. and Wang, J. (2022). Predicting local persistence/recurrence after radiation therapy for head and neck cancer from PET/CT using a multi-objective, multi-classifier radiomics model. *Frontiers in oncology*, 12. (*The first two authors contributed to this work equally*)
14. Morgan, H. E., **Wang, K.**, Dohopolski, M., Yan, Y., *et al.* (2022). Preliminary Evaluation of PTV Margins for Online Adaptive Radiotherapy of the Prostatic Fossa. *Practical Radiation Oncology*.
15. Dohopolski, M., **Wang, K.**, Morgan, H., Sher, D., & Wang, J. (2022). Use of deep learning to predict the need for aggressive nutritional supplementation during head and neck radiotherapy. *Radiotherapy and Oncology*, 171, 129-138.
16. Wang, R., Guo, J., Zhou, Z., **Wang, K.**, Gou, S., Xu, R., ... & Wang, J. (2022). Locoregional recurrence prediction in head and neck cancer based on multi-modality and multi-view feature expansion. *Physics in Medicine & Biology*, 67(12), 125004.
17. Shao, H.C., Li, T., Dohopolski, M.J., Wang, J., Cai, J., Tan, J., **Wang, K.**, and Zhang, Y., 2022. Real-time MRI motion estimation through an unsupervised k-space-driven deformable registration network (KS-RegNet). *Physics in Medicine & Biology*, 67(13), p.135012.
18. Morgan, H. E., **Wang, K.**, Dohopolski, M., Liang, X., Folkert, M. R., Sher, D. J., & Wang, J. (2021). Exploratory ensemble interpretable model for predicting local failure in head and neck cancer: The additive benefit of CT and intra-treatment cone-beam computed tomography features. *Quantitative Imaging in Medicine and Surgery*, 11(12), 4781-4796.
19. George-Jones, A., **Wang, K.**, Wang, J., & Hunter, J. B. (2021). Prediction of vestibular schwannoma enlargement after radiosurgery using tumor shape and MRI texture features. *Otology & Neurotology*, 42(3), e348-e354.
20. George-Jones, A., **Wang, K.**, Wang, J., & Hunter, J. B. (2021). Automated Detection of Vestibular Schwannoma Growth Using a Two-Dimensional UNet Convolutional Neural Network. *The Laryngoscope*, 131(2), E619-E624.
21. Chen, L., Dohopolski, M., Zhou, Z., **Wang, K.**, Wang, R., Sher, D. and Wang, J., 2021. Attention Guided Lymph Node Malignancy Prediction in Head and Neck Cancer. *International Journal of Radiation Oncology* Biology* Physics*, 110(4), pp.1171-1179.
22. **Wang, K.**, Zhou, Z., Wang, R., Chen, L., Zhang, Q., Sher, D., & Wang, J. (2020). A multi - objective radiomics model for the prediction of locoregional recurrence in head and neck squamous cell cancer. *Medical physics*, 47(10), 5392-5400.
23. Zhou, Z., **Wang, K.**, Folkert, M., Liu, H., Jiang, S., Sher, D., & Wang, J. (2020). Multifaceted radiomics for distant metastasis prediction in head & neck cancer. *Physics in Medicine & Biology*,

65(15), 155009.

24. Duan, Y., Cheng, H., **Wang, K.**, & Mou, X. (2020). A Novel Stationary CT Scheme Based on High-Density X-Ray Sources Device. IEEE Access, 8, 112910-112921.

PATENTS

1. Mou, X., Qian, Q., Cheng, H., and **Wang, K.**, "A polygon stationary computed tomography system and imaging methods", Application No. 201810167211.2, China. (Issued)
2. Mou, X., **Wang, K.**, and Cheng, H., "Projection Image Restoration Method for X-ray Source Array Based Radiographic Imaging System", Application No. 201611170284.4. China. (Issued)
3. Mou, X., Cheng, H., and **Wang, K.**, "Computed Tomography Imaging Methods Based on Array X-ray Source Array and Flat Panel Detector", Application No. 201611170283.X, China. (Issued)

CONFERENCE PROCEEDINGS

1. Wang, R., Chen, J., Zhang, X., Wang, J., Liu, H., Zhou, Z. and **Wang, K.**, 2025, September. MedPro-DG: Domain-Aware Masked Contrastive Prompt Learning of Institution Generalization for Outcome Prediction. In *International Conference on Medical Image Computing and Computer-Assisted Intervention* (pp. 413-422). Cham: Springer Nature Switzerland.
2. Chen, M., **Wang, K.** and Wang, J., 2025, April. Multilabel learning and model visualization for reliable head and neck cancer radiotherapy outcome prediction. In *Medical Imaging 2025: Computer-Aided Diagnosis* (Vol. 13407, pp. 69-74). SPIE.
3. **Wang, K.***, Li, Y.*, Dohopolski, M., Peng, T., Lu, W., Zhang, Y., Wang, J. (2022). Recurrence-free Survival Prediction under the Guidance of Automatic Gross Tumor Volume Segmentation for Head and Neck Cancers. The head and neck tumor segmentation and outcome prediction challenge (HECKTOR) of the International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) 2022, Singapore. (**Oral**. The first two authors contributed to this work equally. **Ranked No. 3** in both segmentation and survival prediction task)
4. **Wang, K.**, Shao, H.C., Zhang, Y., Park, J., Jiang, S., Wang, J. (2022). Gas Bubble Motion Artifact Reduction through Simultaneous Motion Estimation and Image Reconstruction. The 7th CT Meeting, June 12-16, 2022, Baltimore, MD.
5. Guo, J., Wang, R., Zhou, Z., **Wang, K.**, Xu, R. and Wang, J. (2021). Multi-Modality and Multi-View 2D CNN to Predict Locoregional Recurrence in Head & Neck Cancer. In 2021 International Joint Conference on Neural Networks (IJCNN) (pp. 1-7). IEEE.
6. **Wang, K.**, Wang, J., Shao, Y. (2021). Enabling High-Resolution (~2 mm or better) Brain Imaging with a Standard Clinical Whole-Body PET: A Simulation Study. The 2021 Nuclear Science Symposium (NSS) and Medical Imaging Conference (MIC).
7. **Wang, K.**, Cheng, H., Chen, X., & Mou, X. (2018, March). Compton scatter tomography with photon-counting detector: a preliminary study. In *Medical Imaging 2018: Physics of Medical Imaging* (Vol. 10573, p. 105732C). International Society for Optics and Photonics.
8. **Wang, K.**, Chen, X., Cheng, H., Qian, Q., & Mou, X. (2017). Image Restoration for Field Emission X-ray Source Array Based Radiographic Imaging. 14th Annual Fully 3D Image Reconstruction in Radiology and Nuclear Medicine, Xi'an, Shaanxi, China, 656-659.
9. Cheng, H., **Wang, K.**, and Mou, X. (2017). A Stationary CT Scheme Based on Field Emission Flat-panel X-ray Source Array. 14th Annual Fully 3D Image Reconstruction in Radiology and Nuclear Medicine, Xi'an, Shaanxi, China, 641-644.

CONFERENCE ABSTRACTS

1. **Wang, K.**, Shao, H., Tang, S., Zhang Y., Wang, J. (2025, July). Simultaneous Motion Estimation and Image Reconstruction with Spatiotemporal Implicit Neural Representation Initial (STINR-SMEIR) for Gas Bubble Motion Artifact Reduction in on-Board CBCT Imaging - AAPM 67th Annual Meeting & Exhibition. **(Oral)**
2. **Wang, K.**, Huang, K., Gopal, A., Chen, S., Sawant, A., Molitoris, J. K., & Cammin, J. (2025, July). Feasibility of Efficient Offline Adaptive Replanning with Hypersight High-Performance Cone-Beam CT on Truebeam for Pelvis RT. In *AAPM 67th Annual Meeting & Exhibition*. AAPM. **(Oral)**
3. Cao, Y., Huang, K., **Wang, K.**, & Gopal, A. (2025, July). A Novel Metric for Predicting Heart Dose Assessment in Left-Sided Breast Cancer Radiotherapy. In AAPM 67th Annual Meeting & Exhibition. AAPM.
4. Chen, M., **Wang, K.**, & Wang, J. (2024, July). Interpretable Multi-Label Deep Survival Prediction Model for Head and Neck Cancer Radiotherapy Outcome Prediction. In AAPM 66th Annual Meeting & Exhibition. AAPM. **(Oral)**
5. Jing, B., **Wang, K.**, et al. (2024, July). Deep Convolutional Lstm Model for Prediction of Pathological Complete Response to Neoadjuvant Chemotherapy for Breast Cancer Using Multi-Time Point DCE MRI and Clinical Data with Uncertainty Quantification. In AAPM 66th Annual Meeting & Exhibition. AAPM. **(Oral)**
6. Tang, S., **Wang, K.**, et al. (2024, July). Progression-Free Survival Prediction for Local Advanced Cervical Cancer after Chemoradiotherapy with MRI-Based Radiomics. In AAPM 66th Annual Meeting & Exhibition. AAPM. **(Oral)**
7. Tang, S., **Wang, K.**, et al. (2024, July). Recurrence-Free Survival Prediction in Anal Squamous Cell Carcinoma with Chemoradiotherapy Using Multi-Modality Data and a Transformer Based Deep Learning Model. In AAPM 66th Annual Meeting & Exhibition. AAPM. **(Oral)**
8. **Wang, K.**, Vyfhuis, M., et al. (2024, July). Challenge in Machine Learning Based Progression-Free Survival Predicting for Breast Cancer Patients Undergoing Adjuvant IMPT: Insights from a CPH Model with Iterative Feature Selection. In AAPM 66th Annual Meeting & Exhibition. AAPM.
9. Chen, M., **Wang, K.**, & Wang, J. (2023, July). Vision Transformer-Based Multi-Label Survival Prediction for Oropharynx Cancer Radiotherapy Using Planning CT. In AAPM 65th Annual Meeting & Exhibition. AAPM. **(Oral)**
10. **Wang, K.**, Li, R., Zhuang, T., & Wang, J. (2023, July). Synthetic Abdominal and Pelvic CT for Gas Bubble Motion Artifact Reduction and Hounsfield Unit Correction of Onboard CBCT for Adaptive Radiotherapy. In AAPM 65th Annual Meeting & Exhibition. AAPM.
11. Tang, S., **Wang, K.**, Hein, D., Lin, G., Sanford, N.N. and Wang, J., 2023. Recurrence-Free Survival Prediction for Anal Squamous Cell Carcinoma Chemoradiotherapy Using Planning CT-Based Radiomics Model. In AAPM 65th Annual Meeting & Exhibition. AAPM.
12. **Wang, K.**, Elamir, A., Karalis, J., ... & Wang, J. (July 2022). Delta radiomic features predict failure and survival outcomes for surgically resected pancreatic cancer patients treated with neoadjuvant therapy. AAPM Annual Meeting, DC. **(Oral)**
13. **Wang, K.**, Morgan, H.E., Yan, Y., Desai, N.B., Hannan, R., Chambers, E., Dohopolski, M., Cai, B., Lin, M.H., Sher, D.J. and Wang, J., 2022. Time Dependence of Coverage of the Prostatic Fossa: Implications for Daily Adaptive Radiotherapy. International Journal of Radiation

Oncology, Biology, Physics, 114(3), pp.e600-e601.

14. **Wang, K.,** Andrade, A., Dohopolski, M., Wang, J. (July 2022). Predicting radiotherapy induced anatomic change for head neck cancer patients using vision transformer. AAPM Annual Meeting, DC. (ePoster)
15. Dohopolski, M., **Wang, K.,** Morgan, H.E., Sher, D.J. and Wang, J., 2022. Using Radiomics to Improve the Diagnostic Accuracy of Indeterminate Residual Primary Disease on Restaging PET/CT Imaging Following Radiation Therapy for Head and Neck Cancers. International Journal of Radiation Oncology, Biology, Physics, 114(3), p.S47. (**Oral**)
16. Dohopolski, M., **Wang, K.,** Morgan, H.E., Sher, D.J. and Wang, J., 2022. Using Prediction Uncertainty to Identify Reliable Predictions for a Deep Learning Model that Predicts the Need for Early Feeding Tube Placement. International Journal of Radiation Oncology, Biology, Physics, 114(3), pp.e96-e97.
17. Elamir, A., **Wang, K.,** Karalis, J., Enrico, S., Polanco, P., Ligorio, M., Wang, J. and Aguilera, T.A., 2022. Delta Radiomic Signature from Neoadjuvant Pancreas Cancer Radiation Planning Volume is Superior to Tumor Proper Volume to Predict Surgical Failures. International Journal of Radiation Oncology, Biology, Physics, 114(3), p.e192.
18. Morgan, H.E., **Wang, K.,** Yan, Y., Desai, N.B., Hannan, R., Chambers, E., Cai, B., Lin, M.H., Sher, D.J., Wang, J., and Wang, A.Z., 2022. Reducing PTV Margins with Daily Adaptive Radiotherapy to the Prostatic Fossa. International Journal of Radiation Oncology, Biology, Physics, 114(3), p.e601.
19. Shao, H., Li, T., Dohopolski, M., Wang, J., Cai, J., Tan, J., **Wang, K.,** and Zhang, Y. (July 2022). Comprehensive Evaluation of a Real-Time 3D MR Imaging Technique Using a Deformation-Driven Deep Convolutional Neural Network (KS-RegNet). AAPM Annual Meeting, DC.
20. Peng, T., **Wang, K.,** Dohopolski, M., Shao, H., Zhang, Y. and Wang, J. (July 2022). Lymph Node Segmentation via Deep Feature Boosting Network in Head and Neck CT Images. AAPM Annual Meeting, DC.
21. **Wang, K.,** Chen, L., George-Jones, N., Hunter, J., Wang, J. (Online, Feb 2021). Attention guided network for vestibular schwannoma growth prediction. SWAAPM Annual Meeting. (**Oral**)
22. **Wang, K.,** Gu, X., Chen, M., & Lu, W. (2019). A Relational Autoencoder for Retrieving Similar Patients in Radiotherapy Treatment Planning. AAPM Annual Meeting, San Antonio, TX. (**Oral**)
23. Dohopolski, M., **Wang, K.,** Morgan, H. E., Chen, L., Sher, D. J., & Wang, J. (2021). Predicting Feeding Tube Placement in Head and Neck Cancer Patients Receiving Radiation Therapy with Machine Learning. International journal of radiation oncology, biology, physics, 111(3), e410.
24. Morgan, H. E., **Wang, K.,** Dohopolski, M., Liang, X., Folkert, M. R., Sher, D. J., & Wang, J. (2021). Explainable Boosting Machine Model with a Parallel Ensemble Design Predicts Local Failure for Head and Neck Cancer with Clinical, CT, and Delta CBCT Radiomic Features. International journal of radiation oncology, biology, physics, 111(3), e115-e116.
25. Yen, A., Morgan, H. E., **Wang, K.,** Albuquerque, K. V., & Wang, J. (2021). Interpretable Machine Learning Model Supported by Parallel Ensemble Learning to Predict Local Recurrence for Patients with Cervical Cancer. International Journal of Radiation Oncology, Biology, Physics, 111(3), e121.
26. Chen, L., **Wang, K.,** Shen, C., Sher, D., & Wang, J. (2021, June). A Bilateral Neural Network for Loco-Regional Recurrence Prediction in Head and Neck Squamous Cell Cancer. AAPM Annual Meeting, online.

27. Chen, L., Dohopolski, M., Zhou, Z., **Wang, K.**, Wang, R., Sher, D. J., & Wang, J. (2020). Segmentation Guided Classification Scheme for Lymph Node Malignancy Prediction in Head and Neck Cancer. *International Journal of Radiation Oncology, Biology, Physics*, 108(3), e841.
28. George-Jones, N., **Wang, K.**, Wang, J., & Hunter, J. B. (2020). An automated method for determining vestibular schwannoma size and growth. *Journal of Neurological Surgery Part B: Skull Base*, 81(S 01), P227.
29. Chen, X., Zhou, M., **Wang, K.**, Wang, Z., & Zhou, Z. (2020, June). Predicting Treatment Outcome After Immunotherapy Based on Delta-Radiomic Model in Metastatic Melanoma. *AAPM Annual Meeting*, online.
30. Wang, R., Zhang, Y., Pachnis, P., Vu, H., **Wang, K.**, Deberardinis, R., & Wang, J. (2020, June). Deciphering Metabolic Features to Target Neuroblastoma Using Machine Learning. *AAPM Annual Meeting*, online.
31. **Wang, K.**, Chen, L., George-Jones, N., Hunter, J., Wang, J. (Online, 2020). Combining radiomics and convolutional neural network to predict tumor growth of vestibular schwannoma. *AAPM Annual Meeting*. (Blue Ribbon ePoster)
32. **Wang, K.**, Zhou, Z., Wang, J. (2020). Head Neck Squamous Cell Cancer Locoregional Recurrence Prediction Using Delta-radiomics Feature. *SWAAPM Annual Meeting*. (**Oral**)
33. Zhou, Z., **Wang, K.**, Liu, H., Sher, D., & Wang, J. (2019, June). Multifaceted Radiomics: towards more reliable radiomics for predicting distant metastasis in head & neck cancer. *AAPM Annual Meeting*, San Antonio, TX. (**Oral**)