

# Stanford

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## Bin Han

Clinical Associate Professor, Radiation Oncology - Radiation Physics

### Bio

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#### BIO

Dr. Bin Han is a Clinical Associate Professor at the Department of Radiation Oncology, Stanford University. Dr. Han finished the CAMPEP-credited Therapeutic Medical Physics residency at Stanford in 2013 and became the American Board of Radiology certified Medical Physicist in 2014. Dr. Han joined the faculty at the Department of Radiation Oncology, Stanford University in 2013 after the residency and was promoted to the associate level in 2019. Dr. Han is responsible for providing high quality clinical medical physics services, developing innovative radiation therapy treatment devices, and new treatment protocols to improve patient care. He leads several research projects including the development of an advanced EPID-based dosimetric solution, an ultrasound system for image guided prostate cancer treatment, depth sensing and 3D-printing techniques for total body irradiation, and predicting treatment effectiveness and cancer recurrence with deep learning. Dr. Han is also mentoring graduate students, postdocs, and residents at Stanford for their research guidance and clinical education.

#### ACADEMIC APPOINTMENTS

- Clinical Associate Professor, Radiation Oncology - Radiation Physics

### Research & Scholarship

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#### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Development of an advanced EPID-based dosimetric solution  
Ultrasound system for image guided prostate cancer treatment,  
Depth sensing and 3D-printing techniques for total body irradiation  
AI applications in predicting treatment effectiveness and cancer recurrence

### Publications

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#### PUBLICATIONS

- **Treatment planning system commissioning of the first clinical biology-guided radiotherapy machine.** *Journal of applied clinical medical physics*  
Simiele, E., Capaldi, D., Breikreutz, D., Han, B., Yeung, T., White, J., Zaks, D., Owens, M., Maganti, S., Xing, L., Surucu, M., Kovalchuk, N.  
2022: e13638
- **Beam commissioning of the first clinical biology-guided radiotherapy system.** *Journal of applied clinical medical physics*  
Han, B., Capaldi, D., Kovalchuk, N., Simiele, E., White, J., Zaks, D., Xing, L., Surucu, M.  
2022: e13607
- **Dose Prediction for Cervical Cancer Brachytherapy Using 3-D Deep Convolutional Neural Network** *IEEE TRANSACTIONS ON RADIATION AND PLASMA MEDICAL SCIENCES*  
Ma, M., Kidd, E., Fahimian, B. P., Han, B., Niedermayr, T. R., Hristov, D., Xing, L., Yang, Y.  
2022; 6 (2): 214-221
- **IMRT and SBRT Treatment Planning Study for the First Clinical Biology-Guided Radiotherapy System.** *Technology in cancer research & treatment*  
Pham, D., Simiele, E., Breikreutz, D., Capaldi, D., Han, B., Surucu, M., Oderinde, S., Vitzthum, L., Gensheimer, M., Bagshaw, H., Chin, A., Xing, L., Chang, et al  
2022; 21: 15330338221100231

- **Small field measurement and monte carlo model validation of a novel image-guided radiotherapy system.** *Medical physics*  
Shi, M., Chuang, C. F., Kovalchuk, N., Bush, K. K., Zaks, D., Xing, L., Surucu, M., Han, B.  
2021
- **Deep learning-enabled EPID-based 3D dosimetry for dose verification of step-and-shoot radiotherapy.** *Medical physics*  
Jia, M., Wu, Y., Yang, Y., Wang, L., Chuang, C., Han, B., Xing, L.  
2021
- **MR to Ultrasound Image Registration with Segmentation-Based Learning for HDR Prostate Brachytherapy**  
Chen, Y., Xing, L., Yu, L., Liu, W., Fahimian, B., Niedermayr, T., Bagshaw, H., Buyyounouski, M., Han, B.  
WILEY.2021
- **MR to ultrasound image registration with segmentation-based learning for HDR prostate brachytherapy.** *Medical physics*  
Chen, Y. n., Xing, L. n., Yu, L. n., Liu, W. n., Fahimian, B. P., Niedermayr, T. n., Bagshaw, H. P., Buyyounouski, M. n., Han, B. n.  
2021
- **Deep learning applications in automatic needle segmentation in ultrasound-guided prostate brachytherapy.** *Medical physics*  
Wang, F., Xing, L., Bagshaw, H., Buyyounouski, M., Han, B.  
2020
- **Densely Connected Neural Network With Unbalanced Discriminant and Category Sensitive Constraints for Polyp Recognition** *IEEE TRANSACTIONS ON AUTOMATION SCIENCE AND ENGINEERING*  
Yuan, Y., Qin, W., Ibragimov, B., Zhang, G., Han, B., Meng, M., Xing, L.  
2020; 17 (2): 574–83
- **Automatic intraprostatic lesion segmentation in multiparametric magnetic resonance images with proposed multiple branch Unet.** *Medical physics*  
Chen, Y. n., Xing, L. n., Yu, L. n., Bagshaw, H. P., Buyyounouski, M. K., Han, B. n.  
2020
- **Beam data modeling of linear accelerators (linacs) through machine learning and its potential applications in fast and robust linac commissioning and quality assurance.** *Radiotherapy and oncology : journal of the European Society for Therapeutic Radiology and Oncology*  
Zhao, W. n., Patil, I. n., Han, B. n., Yang, Y. n., Xing, L. n., Schüller, E. n.  
2020
- **Incorporating imaging information from deep neural network layers into image guided radiation therapy (IGRT).** *Radiotherapy and oncology : journal of the European Society for Therapeutic Radiology and Oncology*  
Zhao, W., Han, B., Yang, Y., Buyyounouski, M., Hancock, S. L., Bagshaw, H., Xing, L.  
2019; 140: 167–74
- **Prostate cancer classification with multiparametric MRI transfer learning model** *MEDICAL PHYSICS*  
Yuan, Y., Qin, W., Buyyounouski, M., Ibragimov, B., Hancock, S., Han, B., Xing, L.  
2019; 46 (2): 756–65
- **Feasibility of Image Registration for Ultrasound-Guided Prostate Radiotherapy Based on Similarity Measurement by a Convolutional Neural Network** *TECHNOLOGY IN CANCER RESEARCH & TREATMENT*  
Zhu, N., Najafi, M., Han, B., Hancock, S., Hristov, D.  
2019; 18
- **Markerless pancreatic tumor target localization enabled by deep learning.** *International journal of radiation oncology, biology, physics*  
Zhao, W. n., Shen, L. n., Han, B. n., Yang, Y. n., Cheng, K. n., Toesca, D. A., Koong, A. C., Chang, D. T., Xing, L. n.  
2019
- **Automatic marker-free target positioning and tracking for image-guided radiotherapy and interventions**  
Zhao, W., Shen, L., Wu, Y., Han, B., Yang, Y., Xing, L., Fei, B., Linte, C. A.  
SPIE-INT SOC OPTICAL ENGINEERING.2019
- **Feasibility of Image Registration for Ultrasound-Guided Prostate Radiotherapy Based on Similarity Measurement by a Convolutional Neural Network.** *Technology in cancer research & treatment*  
Zhu, N., Najafi, M., Han, B., Hancock, S., Hristov, D.  
2019; 18: 1533033818821964

- **Tensor framelet based iterative image reconstruction algorithm for low-dose multislice helical CT.** *PLoS one*  
Nam, H., Guo, M., Yu, H., Lee, K., Li, R., Han, B., Xing, L., Lee, R., Gao, H.  
2019; 14 (1): e0210410
- **Prostate Cancer Classification with Multi-parametric MRI Transfer Learning Model.** *Medical physics*  
Yuan, Y., Qin, W., Buyyounouski, M., Ibragimov, B., Hancock, S., Han, B., Xing, L.  
2018
- **Evaluation of transperineal ultrasound imaging as a potential solution for target tracking during hypofractionated radiotherapy for prostate cancer.** *Radiation oncology (London, England)*  
Han, B., Najafi, M., Cooper, D. T., Lachaine, M., von Eyben, R., Hancock, S., Hristov, D.  
2018; 13 (1): 151
- **A unified material decomposition framework for quantitative dual- and triple-energy CT imaging.** *Medical physics*  
Zhao, W., Vernekohl, D., Han, F., Han, B., Peng, H., Yang, Y., Xing, L., Min, J. K.  
2018
- **RIIS-DenseNet: Rotation-Invariant and Image Similarity Constrained Densely Connected Convolutional Network for Polyp Detection**  
Yuan, Y., Qin, W., Ibragimov, B., Han, B., Xing, L., Frangi, A. F., Schnabel, J. A., Davatzikos, C., AlberolaLopez, C., Fichtinger, G.  
SPRINGER INTERNATIONAL PUBLISHING AG.2018: 620-28
- **Pixel response-based EPID dosimetry for patient specific QA** *JOURNAL OF APPLIED CLINICAL MEDICAL PHYSICS*  
Han, B., Ding, A., Lu, M., Xing, L.  
2017; 18 (1): 9-17
- **Pixel response-based EPID dosimetry for patient specific QA.** *Journal of applied clinical medical physics*  
Han, B., Ding, A., Lu, M., Xing, L.  
2017; 18 (1): 9-17
- **A depth-sensing technique on 3D-printed compensator for total body irradiation patient measurement and treatment planning.** *Medical physics*  
Lee, M., Han, B., Jenkins, C., Xing, L., Suh, T.  
2016; 43 (11): 6137-?
- **Development of an accurate EPID-based output measurement and dosimetric verification tool for electron beam therapy.** *Medical physics*  
Ding, A., Xing, L., Han, B.  
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- **Clinical implementation of intrafraction cone beam computed tomography imaging during lung tumor stereotactic ablative radiation therapy.** *International journal of radiation oncology, biology, physics*  
Li, R., Han, B., Meng, B., Maxim, P. G., Xing, L., Koong, A. C., Diehn, M., Loo, B. W.  
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- **Clinical implementation of intrafraction cone beam computed tomography imaging during lung tumor stereotactic ablative radiation therapy.** *International journal of radiation oncology, biology, physics*  
Li, R., Han, B., Meng, B., Maxim, P. G., Xing, L., Koong, A. C., Diehn, M., Loo, B. W.  
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- **Cone beam CT imaging with limited angle of projections and prior knowledge for volumetric verification of non-coplanar beam radiation therapy: a proof of concept study.** *Physics in medicine and biology*  
Meng, B., Xing, L., Han, B., Koong, A., Chang, D., Cheng, J., Li, R.  
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- **X-ray acoustic computed tomography with pulsed x-ray beam from a medical linear accelerator** *MEDICAL PHYSICS*  
Xiang, L., Han, B., Carpenter, C., Prax, G., Kuang, Y., Xing, L.  
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- **X-ray induced photoacoustic tomography** *Conference on Photons Plus Ultrasound - Imaging and Sensing*  
Xiang, L., Han, B., Carpenter, C., Prax, G., Kuang, Y., Xing, L.  
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- **Fidelity of dose delivery at high dose rate of volumetric modulated arc therapy in a truebeam linac with flattening filter free beams.** *Journal of medical physics / Association of Medical Physicists of India*  
Kalantzis, G., Qian, J., Han, B., Luxton, G.  
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- **Evaluation of the geometric accuracy of surrogate-based gated VMAT using intrafraction kilovoltage x-ray images** *MEDICAL PHYSICS*  
Li, R., Mok, E., Han, B., Koong, A., Xing, L.  
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