Stanford

Murat Surucu

Clinical Associate Professor, Radiation Oncology - Radiation Physics

Bio

ACADEMIC APPOINTMENTS

- Clinical Associate Professor, Radiation Oncology - Radiation Physics

ADMINISTRATIVE APPOINTMENTS

- Chief of Clinical Physics, Stanford University, (2020- present)
- Chief of Clinical Physics, Loyola University Chicago, (2015-2020)

HONORS AND AWARDS

- Jack Fowler Junior Investigator Award, American Association of Physicist in Medicine (AAPM) (7/28/2008)
- Young Investigator Symposium Award, AAPM Midwest Chapter (4/17/2010)
- Best of Physics Award (co-author), American Society of Therapeutic Radiation Oncology (ASTRO) (10/19/2015)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Secretary, AAPM Midwest Chapter (2018 - 2020)
- Treasurer, AAPM Midwest Chapter (2016 - 2018)
- Board Member At Large, AAPM Midwest Chapter (2014 - 2016)
- Member, American Association of Physicists in Medicine (AAPM) (2009 - present)
- Member, American Society of Therapeutic Radiation Oncology (ASTRO) (2011 - present)
- Member, American College of Radiology (ACR) (2016 - present)

PROFESSIONAL EDUCATION

- BS, Bogazici University, Turkey , Physics (2000)
- MS, Bogazici University, Turkey , Biomedical Engineering (2002)
- PhD, University of Southern California , Biomedical Engineering (2007)
- Postdoc, Washington University in St. Louis , Medical Physics (2009)
- Residency, University of Chicago , Medical Physics (2011)

Research & Scholarship

CLINICAL TRIALS

- Performance and Safety of Biology-Guided Radiotherapy Using the RefleXion Medical Radiotherapy System (BIOGUIDE-X), Not Recruiting

Publications

PUBLICATIONS

- **A time- and space-saving Monte Carlo simulation method using post-collimation generative adversarial network for dose calculation of an O-ring gantry Linac.** *Physica medica : PM : an international journal devoted to the applications of physics to medicine and biology : official journal of the Italian Association of Biomedical Physics (AIFB)*
  Shi, M., Cui, S., Chuang, C., Oderinde, O., Kovalchuk, N., Surucu, M., Xing, L., Han, B.
  2024; 119: 103318

- **Exploring deep learning for estimating the isoeffective dose of FLASH irradiation from mouse intestinal histology images.** *International journal of radiation oncology, biology, physics*
  Fu, J., Yang, Z., Melemenidis, S., Viswanathan, V., Dutt, S., Manjappa, R., Lau, B., Soto, L. A., Ashraf, R., Skinner, L., Yu, S. J., Surucu, M., Casey, et al
  2024

- **First-Year Experience of Stereotactic Body Radiation Therapy/Intensity Modulated Radiation Therapy Treatment Using a Novel Biology-Guided Radiation Therapy Machine.** *Advances in radiation oncology*
  Shi, M., Simiele, E., Han, B., Pham, D., Palomares, P., Aguirre, M., Gensheimer, M., Vitzthum, L., Le, Q., Surucu, M., Kovalchuk, N.
  2024; 9 (1): 101300

- **BIOGUIDE-X: A First-in-Human Study of the Performance of Positron Emission Tomography-Guided Radiotherapy.** *International journal of radiation oncology, biology, physics*
  Vitzthum, L. K., Surucu, M., Gensheimer, M. F., Kovalchuk, N., Han, B., Pham, D., Chang, D., Shirvani, S. M., Aksoy, D., Maniyedath, A., Narayanan, M., Da Silva, A. J., Mazin, et al
  2023

- **FLASH-RT does not affect chromosome translocations and junction structures beyond that of CONV-RT dose-rates.** *Radiotherapy and oncology : journal of the European Society for Therapeutic Radiology and Oncology*
  Barghouth, P. G., Melemenidis, S., Montay-Gruel, P., Ollivier, J., Viswanathan, V., Jorge, P. G., Soto, L. A., Lau, B. C., Sadeghi, C., Edlabadkar, A., Zhang, R., Ru, N., Baulch, et al
  2023: 109906

- **Patient-specific Auto-segmentation on Daily kVCT Images for Adaptive Radiotherapy.** *International journal of radiation oncology, biology, physics*
  Chen, Y., Gensheimer, M. F., Bagshaw, H. P., Butler, S., Yu, L., Zhou, Y., Shen, L., Kovalchuk, N., Surucu, M., Chang, D. T., Xing, L., Han, B.
  2023

- **Framework for Quality Assurance of Ultra-High Dose Rate Clinical Trials Investigating FLASH Effects and Current Technology Gaps.** *International journal of radiation oncology, biology, physics*
  Zou, W., Zhang, R., Schueler, E., Taylor, P. A., Mascia, A. E., Diffenderfer, E. S., Zhao, T., Ayan, A. S., Sharma, M., Yu, S. J., Lu, W., Bosch, W. R., Tsien, et al
  2023

- **Clinical LINAC-based electron FLASH: Pathway for practical translation to FLASH clinical trials: LINAC electron FLASH.** *International journal of radiation oncology, biology, physics*
  No, H. J., Wu, Y. F., Dworkin, M. L., Manjappa, R., Skinner, L., Ashraf, M. R., Lau, B., Melemenidis, S., Viswanathan, V., Yu, A. S., Surucu, M., Schüler, E., Graves, et al
  2023

- **FLASH-RT does not affect chromosome translocations and junction structures beyond that of CONV-RT dose-rates.** *bioRxiv : the preprint server for biology*
  Barghouth, P. G., Melemenidis, S., Montay-Gruel, P., Ollivier, J., Viswanathan, V., Jorge, P. G., Soto, L. A., Lau, B. C., Sadeghi, C., Edlabadkar, A., Manjappa, R., Wang, J., Bouteiller, et al
  2023

- **Mitigation of IMRT/SBRT treatment planning errors on the RefleXion X1 system using FMEA within Six Sigma framework** *Advances in Radiation Oncology*
  Simiele, E., Han, B., Skinner, L., Pham, D., Lewis, J., Gensheimer, M., Vitzthum, L., Chang, D., Surucu, M., Kovalchuk, N.
  2023

- **Image-mode performance characterization of a positron emission tomography subsystem designed for Biology-guided radiotherapy (BgRT).** *The British journal of radiology*
  Hu, Z., Bieniosek, M., Ferri, V., Iagaru, A., Kovalchuk, N., Han, B., Xing, L., Vitzthum, L., Olcott, P., Narayanan, M., Laurence, T., Ren, Y., Oderinde, et al

2022: 20220387

- **Impact of respiratory motion on lung dose during total marrow irradiation.** *Frontiers in oncology*
  Kavak, A. G., Surucu, M., Ahn, K. H., Pearson, E., Aydogan, B.
  2022; 12: 924961

- **Feasibility of Single Fraction Brain Metastases Radiotherapy in a Novel Ring Gantry Treatment System**
  Oderinde, O., Schuman, C., Owens, M., Surucu, M., Da Silva, A., Shirvani, S.
  LIPPINCOTT WILLIAMS & WILKINS.2022: S56

- **Design and validation of a dosimetric comparison scheme tailored for ultra-high dose-rate electron beams to support multicenter FLASH preclinical studies.** *Radiotherapy and oncology : journal of the European Society for Therapeutic Radiology and Oncology*
  Gonçalves Jorge, P., Melemenidis, S., Grilj, V., Buchillier, T., Manjappa, R., Viswanathan, V., Gondré, M., Vozenin, M. C., Germond, J. F., Bochud, F., Moeckli, R., Limoli, C., Skinner, et al
  2022

- **Treatment planning system commissioning of the first clinical biology-guided radiotherapy machine.** *Journal of applied clinical medical physics*
  Simiele, E., Capaldi, D., Breitkreutz, 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

- **IMRT and SBRT Treatment Planning Study for the First Clinical Biology-Guided Radiotherapy System.** *Technology in cancer research & treatment*
  Pham, D., Simiele, E., Breitkreutz, 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

- **Uterine perforation during brachytherapy for cervical cancer: Complications, outcomes, and best practices for forward treatment planning and management.** *Brachytherapy*
  Small, W. J., Kim, Y. S., Joyce, C., Surucu, M., Leshyk, M., Harkenrider, M. M., Potkul, R. K., Liotta, M., Winder, A., Altoos, B.
  2021

- **Characterization of Markerless Tumor Tracking Using the On-Board Imager of a Commercial Linear Accelerator Equipped With Fast-kV Switching Dual-Energy Imaging.** *Advances in radiation oncology*
  Roeske, J. C., Mostafavi, H., Haytmyradov, M., Wang, A., Morf, D., Cortesi, L., Surucu, M., Patel, R., Cassetta, R., Zhu, L., Lehmann, M., Harkenrider, M. M.
  2020; 5 (5): 1006–13

- **A practical method for quantifying dose in bone and lung using TLDs when using 6 and 15 MV photon beams.** *Physics in medicine and biology*
  Sarigul, N., Surucu, M., Reft, C. S., Malin, M., Yegingil, Z., Ayadogan, B.
  2020

- **Adaptive weighted log subtraction based on neural networks for markerless tumor tracking using dual-energy fluoroscopy** *MEDICAL PHYSICS*
  Haytmyradov, M., Mostafavi, H., Cassetta, R., Patel, R., Surucu, M., Zhu, L., Roeske, J. C.
  2020: 672–80

- **Failure mode and effects analysis of linac-based liver stereotactic body radiotherapy.** *Medical physics*
  Rusu, I., Thomas, T. O., Roeske, J. C., Mescioglu, I., Melian, E., Surucu, M.
  2019

- **ENERGY RESPONSE FACTOR OF BEO DOSEMETER CHIPS: A MONTE CARLO SIMULATION AND GENERAL CAVITY THEORY STUDY** *RADIATION PROTECTION DOSIMETRY*
  Sarigul, N., Surucu, M., Aydogan, B.
  2019; 185 (3): 303–9

- **Markerless tumor tracking using fast-kV switching dual-energy fluoroscopy on a benchtop system** *MEDICAL PHYSICS*
  Haytmyradov, M., Mostafavi, H., Wang, A., Zhu, L., Surucu, M., Patel, R., Ganguly, A., Richmond, M., Cassetta, R., Harkenrider, M. M., Roeske, J. C.

2019; 46 (7): 3235–44

- **The Impact of Transitioning to Prospective Contouring and Planning Rounds as Peer Review.** *Advances in radiation oncology*
  Surucu, M., Bajaj, A., Roeske, J. C., Block, A. M., Price, J., Small, W. J., Solanki, A. A.
  2019; 4 (3): 532–40

- **Markerless Tumor Tracking using Fast-kV Switching Dual Energy Fluoroscopy on a Benchtop System.** *Medical physics*
  Haytmyradov, M., Mostafavi, H., Wang, A., Zhu, L., Surucu, M., Patel, R., Ganguly, A., Richmond, M., Cassetta, R., Harkenrider, M. M., Roeske, J. C.
  2019

- **Fast-switching dual energy cone beam computed tomography using the on-board imager of a commercial linear accelerator.** *Physics in medicine and biology*
  Cassetta, F. R., Lehmann, M. n., Haytmyradov, M. n., Patel, R. n., Wang, A. S., Cortesi, L. n., Morf, D. n., Seghers, D. n., Surucu, M. n., Mostafavi, H. n., Roeske, J. C.
  2019

- **Transitioning From a Low-Dose-Rate to a High-Dose-Rate Prostate Brachytherapy Program: Comparing Initial Dosimetry and Improving Workflow Efficiency Through Targeted Interventions.** *Advances in radiation oncology*
  Solanki, A. A., Mysz, M. L., Patel, R., Surucu, M., Kang, H., Plypoo, A., Bajaj, A., Korpics, M., Martin, B., Hentz, C., Gupta, G., Farooq, A., Baldea, et al
  2019; 4 (1): 103–11

- **A novel phantom for characterization of dual energy imaging using an on-board imaging system.** *Physics in medicine and biology*
  Haytmyradov, M., Patel, R., Mostafavi, H., Surucu, M., Wang, A. S., Harkenrider, M. M., Roeske, J. C.
  2018

- **Can MRI-only replace MRI-CT planning with a titanium tandem and ovoid applicator?** *BRACHYTHERAPY*
  Harkenrideri, M. M., Patel, R., Surucu, M., Chinsky, B., Mysz, M. L., Wood, A., Ryan, K., Shea, S. M., Small, W., Roeske, J. C.
  2018; 17 (5): 747–52

- **Evaluation of Radiomics to Predict the Accuracy of Markerless Motion Tracking of Lung Tumors: A Preliminary Study** *FRONTIERS IN ONCOLOGY*
  Nguyen, K., Haytmyradov, M., Mostafavi, H., Patel, R., Surucu, M., Block, A., Harkenrider, M. M., Roeske, J. C.
  2018; 8: 292

- **Comparison of dosimetric and clinical outcomes between short- and long-channel cylinder applicators for vaginal brachytherapy in intermediate- and high-risk endometrial cancer** *BRACHYTHERAPY*
  Kharouta, M. Z., Pham, N., Nieto, K., Surucu, M., Mysz, M. L., Albuquerque, K., Winder, A., Liotta, M., Potkul, R. K., Small, W., Harkenrider, M. M.
  2018; 17 (4): 673–79

- **Decreased Risk of Radiation Pneumonitis With Coincident Concurrent Use of Angiotensin-converting Enzyme Inhibitors in Patients Receiving Lung Stereotactic Body Radiation Therapy** *AMERICAN JOURNAL OF CLINICAL ONCOLOGY-CANCER CLINICAL TRIALS*
  Alite, F., Balasubramanian, N., Adams, W., Surucu, M., Mescioglu, I., Harkenrider, M. M.
  2018; 41 (6): 576–80

- **Providing MR Imaging for Cervical Cancer Brachytherapy: Lessons for Radiologists**
  Sullivan, T., Yacoub, J. H., Harkenrider, M. M., Small, W., Surucu, M., Shea, S. M.
  RADIOLOGICAL SOC NORTH AMERICA.2018: 932–44

- **Association of conformality index and post-treatment radiation pneumonitis in early-stage non-small cell lung cancer treated with stereotactic body radiotherapy** *JOURNAL OF RADIATION ONCOLOGY*
  Hutten, R., Surucu, M., Joyce, C., Alite, F., Stang, K., Small, C., Sethi, A., Emami, B., Harkenrider, M. M.
  2018; 7 (1): 63–67

- **A Medicare cost analysis of MRI- versus CT-based high-dose-rate brachytherapy of the cervix: Can MRI-based planning be less costly?**
  Bajaj, A., Harmon, G., Weaver, J., Martin, B., Mysz, M., Surucu, M., Roeske, J. C., Konski, A. A., Small, W., Harkenrider, M. M.
  ELSEVIER SCIENCE INC.2018: 326–33

- **Reduction of MRI signal distortion from titanium intracavitary brachytherapy applicator by optimizing pulse sequence parameters** *BRACHYTHERAPY*
  Sullivan, T. P., Harkenrider, M. M., Surucu, M., Wood, A. M., Yacoub, J. H., Shea, S. M.
  2018; 17 (2): 377–82

- **Delineating the relationship between Point A prescription dose and pelvic lymph node doses in intracavitary high-dose-rate brachytherapy treatment of cervical cancer for use in low- and middle-income countries** *BRACHYTHERAPY*

Weaver, J., Harmon, G., Harkenrider, M. M., Surucu, M., Wood, A., Alite, F., Small, W.
2018; 17 (1): 201–7

- **Early outcomes and impact of a hybrid IC/IS applicator for a new MRI-based cervical brachytherapy program** *BRACHYTHERAPY*
  Harkenrider, M. M., Surucu, M., Harmon, G., Mysz, M. L., Shea, S. M., Yacoub, J., Goldberg, A., Liotta, M., Winder, A., Potkul, R., Roeske, J. C., Small, W.
  2018; 17 (1): 187–93

- **Evaluation of Deformable Image Registration-Based Contour Propagation From Planning CT to Cone-Beam CT** *TECHNOLOGY IN CANCER RESEARCH & TREATMENT*
  Woerner, A. J., Choi, M., Harkenrider, M. M., Roeske, J. C., Surucu, M.
  2017; 16 (6): 801–10

- **Spectral characterization of tissues in high spectral and spatial resolution MR images: Implications for a classification-based synthetic CT algorithm** *MEDICAL PHYSICS*
  Wood, A. M., Shea, S. M., Medved, M., Karczmar, G. S., Surucu, M., Gros, S., Small, W., Roeske, J.
  2017; 44 (5): 1865–75

- **Clinical Application of a Hybrid RapidArc Radiotherapy Technique for Locally Advanced Lung Cancer** *TECHNOLOGY IN CANCER RESEARCH & TREATMENT*
  Silva, S. R., Surucu, M., Steber, J., Harkenrider, M. M., Choi, M.
  2017; 16 (2): 224–30

- **Adaptive Radiotherapy for Head and Neck Cancer: Implications for Clinical and Dosimetry Outcomes** *TECHNOLOGY IN CANCER RESEARCH & TREATMENT*
  Surucu, M., Shah, K. K., Roeske, J. C., Choi, M., Small, W., Emami, B.
  2017; 16 (2): 218–23

- **How one institution overcame the challenges to start an MRI-based brachytherapy program for cervical cancer** *JOURNAL OF CONTEMPORARY BRACHYTHERAPY*
  Harkenrider, M. M., Shea, S. M., Wood, A. M., Chinsky, B., Bajaj, A., Mysz, M., Yacoub, J. H., Goldberg, A., Liotta, M., Potkul, R., Surucu, M., Roeske, J., Small, et al
  2017; 9 (2): 177–86

- **A novel surrogate to identify anatomical changes during radiotherapy of head and neck cancer patients** *MEDICAL PHYSICS*
  Gros, S. A., Xu, W., Roeske, J. C., Choi, M., Emami, B., Surucu, M.
  2017; 44 (3): 924–34

- **Improving the Accessibility of Patient Care Through Integration of the Hospital and Radiation Oncology Electronic Health Records** *JCO CLINICAL CANCER INFORMATICS*
  Solanki, A., Surucu, M., Bajaj, A., Kaczmarz, B., Martin, B., Price, J., Perino, C., McCoo, T., Payonk, G., Roeske, J. C., Small, W.
  2017; 1: 1–8

- **Metal Artifact Reduction in Cone-Beam Computed Tomography for Head and Neck Radiotherapy** *TECHNOLOGY IN CANCER RESEARCH & TREATMENT*
  Korpics, M., Johnson, P., Patel, R., Surucu, M., Choi, M., Emami, B., Roeske, J. C.
  2016; 15 (6): NP88–NP94

- **Observer Evaluation of a Metal Artifact Reduction Algorithm Applied to Head and Neck Cone Beam Computed Tomographic Images** *INTERNATIONAL JOURNAL OF RADIATION ONCOLOGY BIOLOGY PHYSICS*
  Korpics, M., Surucu, M., Mescioglu, I., Alite, F., Block, A. M., Choi, M., Emami, B., Harkenrider, M. M., Solanki, A. A., Roeske, J. C.
  2016; 96 (4): 897–904

- **RECONSIDERING RADIORESISTANCE: LINAC-BASED STEREOTACTIC RADIOSURGERY FOR INTRACRANIAL METASTASES FROM MELANOMA AND RENAL CELL CARCINOMA**
  Feng, C., Lemons, J., Raleigh, D. R., Surucu, M., Farrey, K., Yamini, B., Chmura, S. J., Golden, D. W.
  OXFORD UNIV PRESS INC.2016: 181

- **Examination of general cavity theory for magnesium and titanium doped lithium fluoride (TLD-100) of varying thicknesses in bone and lung** *RADIATION MEASUREMENTS*
  Sarigul, N., Surucu, M., Reft, C., Yegingil, Z., Aydogan, B.
  2016; 94: 1–7

- **Predictors of post-treatment symptomatic pneumonitis in lung SBRT patients through decision tree analysis** *JOURNAL OF RADIATION ONCOLOGY*
  Petras, K., Surucu, M., Mescioglu, I., Alite, F., Shah, K., Emami, B., Small, W., Harkenrider, M. M.
  2016; 5 (3): 273–78
- **Moving towards hospital and radiation oncology EMR integration: Results of an institutional survey.**
  Solanki, A., Surucu, M., Kaczmarz, B., McCoo, T., Roeske, J., Small, W.
  AMER SOC CLINICAL ONCOLOGY.2016
- **Decision Trees Predicting Tumor Shrinkage for Head and Neck Cancer: Implications for Adaptive Radiotherapy** *TECHNOLOGY IN CANCER RESEARCH & TREATMENT*
  Surucu, M., Shah, K. K., Mescioglu, I., Roeske, J. C., Small, W., Choi, M., Emami, B.
  2016; 15 (1): 139–45
- **Evaluation of a template-based algorithm for markerless lung tumour localization on single- and dual-energy kilovoltage images** *BRITISH JOURNAL OF RADIOLOGY*
  Block, A. M., Patel, R., Surucu, M., Harkenrider, M. M., Roeske, J. C.
  2016; 89 (1068): 20160648
- **Bladder distension improves the dosimetry of organs at risk during intracavitary cervical high-dose-rate brachytherapy** *BRACHYTHERAPY*
  Harmon, G., Chinsky, B., Surucu, M., Harkenrider, M., Small, W.
  2016; 15 (1): 30–34
- **A survey on table tolerances and couch overrides in radiotherapy** *JOURNAL OF APPLIED CLINICAL MEDICAL PHYSICS*
  Chinsky, B., Patel, R., Panfil, J., Surucu, M., Roeske, J. C.
  2016; 17 (6): 405–20
- **Leukemia Cutis of the Face, Scalp, and Neck Treated with Non-coplanar Split Field Volumetric Modulated Arc Therapy: A Case Report** *CUREUS*
  Stang, K., Alite, F., Steber, J., Emami, B., Surucu, M.
  2015; 7 (12): e430
- **A multi-institutional study to assess adherence to lung stereotactic body radiotherapy planning goals** *MEDICAL PHYSICS*
  Woerner, A., Roeske, J. C., Harkenrider, M. M., Fan, J., Aydogan, B., Koshy, M., Laureckas, R., Vali, F., Campana, M., Surucu, M.
  2015; 42 (8): 4629–35
- **Markerless motion tracking of lung tumors using dual-energy fluoroscopy** *MEDICAL PHYSICS*
  Patel, R., Panfil, J., Campana, M., Block, A. M., Harkenrider, M. M., Surucu, M., Roeske, J. C.
  2015; 42 (1): 254–62
- **JUDICIOUS USE OF RADIOSURGERY (SRS) MAY CHANGE THE ULTIMATE PATTERNS OF FAILURE IN PATIENTS WITH BRAIN METASTASIS FROM MELANOMA**
  Rezvi, U., Melian, E., Surucu, M., Mescioglu, I., Prabhu, V., Clark, J., Anderson, D.
  OXFORD UNIV PRESS INC.2013: 186
- **INTRACRANIAL CONTROL OF RENAL CELL CARCINOMA BRAIN METASTASIS USING LINAC BASED STEREOTACTIC RADIOSURGERY**
  Shah, K., Surucu, M., Melian, E., Anderson, D., Prabhu, V., Origitano, T., Sethi, A., Emami, B.
  OXFORD UNIV PRESS INC.2012: 141
- **Verification of dose distribution for volumetric modulated arc therapy total marrow irradiation in a humanlike phantom** *MEDICAL PHYSICS*
  Surucu, M., Yeginer, M., Kavak, G. O., Fan, J., Radosevich, J. A., Aydogan, B.
  2012; 39 (1): 281–88
- **Planning tools for modulated electron radiotherapy.** *Medical physics*
  Surucu, M., Klein, E. E., Mamalui-Hunter, M., Mansur, D. B., Low, D. A.
  2010; 37 (5): 2215-24