

Stanford



Adam Wang

Assistant Professor of Radiology and, by courtesy, of Electrical Engineering

Bio

BIO

My group develops technologies for advanced x-ray and CT imaging, including artificial intelligence for CT acquisition, reconstruction, and image processing; novel system and detector designs; spectral imaging; model-based image reconstruction; and radiation transport methods. I am also the Director of the Zeego Lab and the Tabletop X-Ray Lab.

I completed my PhD in Electrical Engineering at Stanford under the supervision of Dr. Norbert Pelc, developing strategies for maximizing the information content of dual energy CT and photon counting detectors. I then pursued a postdoc at Johns Hopkins with Dr. Jeff Siewerdsen in Biomedical Engineering, developing reconstruction and registration methods for x-ray based image-guided surgery. Prior to returning to Stanford in 2018, I was a Senior Scientist at Varian Medical Systems, developing x-ray/CT methods for image-guided radiation therapy.

ACADEMIC APPOINTMENTS

- Assistant Professor, Radiology
- Assistant Professor (By courtesy), Electrical Engineering
- Member, Bio-X
- Member, Wu Tsai Human Performance Alliance

HONORS AND AWARDS

- Council of Early Career Investigators in Imaging, Academy for Radiology & Biomedical Imaging Research (2020)
- Early Career Investigator in Imaging Travel Award, AAPM (2020)
- Featured Cover Article, Medical Physics journal (2018)
- Best in Physics (Imaging) abstract, American Association of Physicists in Medicine (AAPM) Annual Meeting (2016)
- Featured Cover Article, Medical Physics journal (2015)
- Jack Fowler Junior Investigator, winner, AAPM Annual Meeting (2014)
- AAPM Research Seed Grant, American Association of Physicists in Medicine (2013)
- NRSA Postdoctoral Fellowship, NIH (2013)
- Graduate Community Award, Stanford Asian American Activities Center (2011)
- Skilling Award for Outstanding Teaching Assistant in Electrical Engineering, Stanford University (2011)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, American Association of Physicists in Medicine (AAPM) (2013 - present)

PROFESSIONAL EDUCATION

- Postdoctoral Fellow, Johns Hopkins University , Biomedical Engineering (2014)
- PhD, Stanford University , Electrical Engineering (2012)
- MS, Stanford University , Electrical Engineering (2008)
- BS, University of Texas at Austin , Electrical Engineering (2006)

PATENTS

- Gerhard Kleinszig, Jeffrey Siewerdsen, Sebastian Vogt, Adam Wang. "United States Patent 10,022,098 Method and device for generating a low-dose X-ray image preview, imaging system and computer program product"
- Adam Wang, Jeffrey Siewerdsen. "United States Patent 10,064,591 System, method and computer readable medium for preview of low-dose x-ray projection and tomographic images"
- Josh Star-Lack, Adam Wang, Alexander Maslowski. "United States Patent 10,098,606 Automatic organ-dose-estimation for patient-specific computed tomography scans"
- Alexander Maslowski, Adam Wang, Josh Star-Lack, Mingshan Sun, Todd Wareing. "United States Patent 10,327,727 Automatic estimating and reducing scattering in computed tomography scans"
- Daniel Shedlock, Josh Star-Lack, Adam Wang. "United States Patent 10,330,798 Scintillating glass pixelated imager"
- Jeffrey Siewerdsen, Yoshito Otake, Joseph Webster Stayman, Ali Uneri, Adam Wang, Sarah Ouadah. "United States Patent 10,478,148 Self-calibrating projection geometry for volumetric image reconstruction"
- Pavlo Baturin, Adam Wang, Liangjia Zhu. "United States Patent 10,739,473 Image fusion in multi-layer flat panel imager"
- Blake Gaderlund, Josh Star-Lack, John Van Heteren, Adam Wang. "United States Patent 10,960,232 Single-pass imaging and radiation treatment delivery via an extended rotation gantry"
- John Van Heteren, Petr Jordan, Adam Wang, Josh Star-Lack. "United States Patent 10,967,202 Adaptive image filtering for volume reconstruction using partial image data"
- Daniel Shedlock, Josh Star-Lack, Adam Wang. "United States Patent 11,079,499 Scintillating glass pixelated imager"
- Pascal Paysan, Marcus Brehm, Adam Wang, Dieter Seghers, Josh Star-Lack. "United States Patent 11,173,324 Iterative image reconstruction in image-guided radiation therapy"
- Adam Wang, Norbert Pelc. "United States Patent 8,194,820 Optimal weights for measuring spectral x-ray data"

LINKS

- Wang Group: <http://med.stanford.edu/wanggroup.html>
- Zeego Lab: <https://med.stanford.edu/zeegolab.html>
- Radiological Sciences Laboratory (RSL): <https://med.stanford.edu/rsl.html>
- Google Scholar: <https://scholar.google.com/citations?user=-YkSTCkAAAAJ&hl=en>
- LinkedIn: <https://www.linkedin.com/in/wangadam/>

Teaching

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Emeric Boigne

Postdoctoral Faculty Sponsor

Abdullah-Al-Zubaer Imran, Kian Shaker, Sen Wang

Doctoral Dissertation Advisor (AC)

Yirong Yang

Publications

PUBLICATIONS

- **Technical note: Evaluation of a V-Net autosegmentation algorithm for pediatric CT scans: Performance, generalizability and application to patient-specific CT dosimetry.** *Medical physics*
Adamson, P. M., Bhattbhatt, V., Principi, S., Beriwal, S., Strain, L. S., Offe, M., Wang, A. S., Vo, N., Schmidt, T. G., Jordan, P.
2022
- **Science and practice of imaging physics through 50 years of SPIE Medical Imaging conferences.** *Journal of medical imaging (Bellingham, Wash.)*
Wang, A., Cunningham, I., Danielsson, M., Fahrig, R., Flohr, T., Hoeschen, C., Noo, F., Sabol, J. M., Siewerdsen, J. H., Tingberg, A., Yorkston, J., Zhao, W., Samei, et al
2022; 9 (Suppl 1): 012205
- **Pediatric chest-abdomen-pelvis and abdomen-pelvis CT images with expert organ contours.** *Medical physics*
Jordan, P., Adamson, P. M., Bhattbhatt, V., Beriwal, S., Shen, S., Radermecker, O., Bose, S., Strain, L. S., Offe, M., Fraley, D., Principi, S., Ye, D. H., Wang, et al
1800
- **Structural analysis of biomass pyrolysis and oxidation using in-situ X-ray computed tomography** *COMBUSTION AND FLAME*
Boigne, E., Bennett, N., Wang, A., Ihme, M.
2022; 235
- **Quantitative X-ray computed tomography: Prospects for detailed in-situ imaging in bench-scale fire measurements** *FIRE SAFETY JOURNAL*
Boigne, E., Bennett, N., Wang, A., Ihme, M.
2021; 126
- **Deep learning-based reconstruction of interventional tools and devices from four X-ray projections for tomographic interventional guidance.** *Medical physics*
Eulig, E., Maier, J., Knaup, M., Bennett, N. R., Horndler, K., Wang, A. S., KachelrieSS, M.
2021
- **Single-pass metal artifact reduction using a dual-layer flat panel detector.** *Medical physics*
Shi, L., Bennett, N. R., Shiroma, A., Sun, M., Zhang, J., Colbeth, R., Star-Lack, J., Lu, M., Wang, A. S.
2021
- **Spectral Photon Counting CT: Imaging Algorithms and Performance Assessment.** *IEEE transactions on radiation and plasma medical sciences*
Wang, A. S., Pelc, N. J.
2021; 5 (4): 453-464
- **Impact of Upstream Medical Image Processing on Downstream Performance of a Head CT Triage Neural Network.** *Radiology. Artificial intelligence*
Hooper, S. M., Dunnmon, J. A., Lungren, M. P., Mastrodicasa, D., Rubin, D. L., Re, C., Wang, A., Patel, B. N.
2021; 3 (4): e200229
- **An analysis of scatter characteristics in x-ray CT spectral correction.** *Physics in medicine and biology*
Zhang, T., Chen, Z., Zhou, H., Bennett, N. R., Wang, A. S., Gao, H.
2021
- **Characterization of x-ray focal spots using a rotating edge.** *Journal of medical imaging (Bellingham, Wash.)*
Shi, L., Bennett, N. R., Wang, A. S.
2021; 8 (2): 023502
- **Densely Sampled Spectral Modulation for X-Ray CT Using a Stationary Modulator with Flying Focal Spot: A Conceptual and Feasibility Study.** *Medical physics*
Gao, H., Zhang, T., Bennett, N. R., Wang, A.
2021
- **Abbreviated on-treatment CBCT using roughness penalized mono-energization of kV-MV data and a multi-layer MV imager.** *Physics in medicine and biology*
Jacobson, M. W., Lehmann, M. n., Huber, P. n., Wang, A. S., Myronakis, M. E., Shi, M. n., Ferguson, D. n., Valencia Lozano, I. n., Hu, Y. H., Baturin, P. n., Harris, T. C., Fueglistaller, R. n., Williams, et al

2021

- **Personalized CT Organ Dose Estimation from Scout Images** *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*
Imran, A., Wang, S., Pal, D., Dutta, S., Patel, B., Zucker, E., Wang, A.
2021
- **SSIQA: Multi-task learning for non-reference CT image quality assessment with self-supervised noise level prediction** *18th International Symposium on Biomedical Imaging (ISBI)*
Imran, A., Pal, D., Patel, B., Wang, A.
IEEE.2021: 1962–1965
- **MultiMix: Sparingly Supervised, Extreme Multitask Learning From Medical Images** *18th International Symposium on Biomedical Imaging (ISBI)*
Haque, A., Imran, A., Wang, A., Terzopoulos, D.
IEEE.2021
- **Upstream Machine Learning in Radiology.** *Radiologic clinics of North America*
Sandino, C. M., Cole, E. K., Alkan, C., Chaudhari, A. S., Loening, A. M., Hyun, D., Dahl, J., Imran, A. A., Wang, A. S., Vasanawala, S. S.
2021; 59 (6): 967-985
- **Generalized Multi-Task Learning from Substantially Unlabeled Multi-Source Medical Image Data** *Journal of Machine Learning for Biomedical Imaging*
Haque, A., Imran, A., Wang, A., Terzopoulos, D.
2021
- **Single-Shot Quantitative X-ray Imaging from Simultaneous Scatter and Dual Energy Measurements: A Simulation Study**
Wang, A. S., Bosmans, H., Zhao, W., Yu, L.
SPIE-INT SOC OPTICAL ENGINEERING.2021
- **Dual energy chest x-ray for improved COVID-19 detection using a dual-layer flat-panel detector: Simulation and phantom studies**
Shi, L., Bennett, N., Lu, M., Sun, M., Zhang, J., Star-Lack, J., Tsai, E. B., Guo, H., Wang, A. S., Bosmans, H., Zhao, W., Yu, L.
SPIE-INT SOC OPTICAL ENGINEERING.2021
- **Analytical model for pulse pileup in photon counting detectors with seminonparalyzable behavior**
Yang, Y., Pelc, N. J., Wang, A. S., Bosmans, H., Zhao, W., Yu, L.
SPIE-INT SOC OPTICAL ENGINEERING.2021
- **Validation of a deterministic linear Boltzmann transport equation solver for rapid CT dose computation using physical dose measurements in pediatric phantoms.** *Medical physics*
Principi, S., Lu, Y., Liu, Y., Wang, A., Maslowski, A., Wareing, T., Van Heteren, J., Schmidt, T. G.
2021
- **Deterministic Boltzmann Transport Equation Solver for Patient-Specific CT Dose Estimation: Comparison Against a Monte Carlo Benchmark for Realistic Scanner Configurations and Patient Models.** *Medical physics*
Principi, S., Wang, A., Maslowski, A., Wareing, T., Jordan, P., Schmidt, T. G.
2020
- **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
- **Detective quantum efficiency of photon-counting CdTe and Si detectors for computed tomography: a simulation study.** *Journal of medical imaging (Bellingham, Wash.)*
Persson, M., Wang, A., Pelc, N. J.
2020; 7 (4): 043501
- **Characterization and Potential Applications of a Dual-Layer Flat-Panel Detector.** *Medical physics*
Shi, L., Lu, M., Bennett, N. R., Shapiro, E., Zhang, J., Colbeth, R., Star-Lack, J., Wang, A. S.
2020
- **Low-dose megavoltage cone-beam computed tomography using a novel multi-layer imager (MLI).** *Medical physics*

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- Myronakis, M., Huber, P., Lehmann, M., Fueglistaller, R., Jacobson, M., Hu, Y., Baturin, P., Wang, A., Shi, M., Harris, T., Morf, D., Berbeco, R.
2020
- **Spectral modulator with flying focal spot for cone-beam CT: a feasibility study.** *SPIE Medical Imaging 2020: Physics of Medical Imaging*
Gao, H., Zhou, H., Zhu, L., Pelc, N., Bennett, R., Wang, A.
2020
 - **Comparative study of dual energy cone-beam CT using a dual-layer detector and kVp switching for material decomposition.** *SPIE Medical Imaging 2020: Physics of Medical Imaging*
Shi, L., Bennett, N. R., Shapiro, E., Colbeth, R. E., Star-Lack, J., Lu, M., Wang, A. S.
2020
 - **Simultaneous in-situ measurements of gas temperature and pyrolysis of biomass smoldering via X-ray computed tomography.** *Proceedings of the Combustion Institute*
Boigne, E., Bennett, N. R., Wang, A., Mohri, K., Ihme, M.
2020
 - **Reconstruction of x-ray focal spot distribution using a rotating edge.** *SPIE Medical Imaging 2020: Physics of Medical Imaging*
Shi, L., Bennett, N. R., Wang, A. S.
2020
 - **Deep learning-aided CBCT image reconstruction of interventional material from four x-ray projections.** *SPIE Medical Imaging 2020: Physics of Medical Imaging*
Eulig, E., Mier, J., Bennett, N. R., Knaup, M., Hörndler, K., Wang, A., Kachelrieß, M.
2020
 - **Evaluation of deep learning segmentation for rapid, patient-specific CT organ dose estimation using an LBTE solver.** *SPIE Medical Imaging 2020: Physics of Medical Imaging*
Offe, M., Fraley, D., Adamson, P. M., Principi, S., Wang, A. S., Jordan, P., Schmidt, T. G.
2020
 - **Projection-domain metal artifact correction using a dual layer detector.** *SPIE Medical Imaging 2020: Physics of Medical Imaging*
Shi, L., Bennett, N. R., Star-Lack, J., Lu, M., Wang, A. S.
2020
 - **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
 - **A novel method for fast image simulation of flat panel detectors.** *Physics in medicine and biology*
Shi, M., Myronakis, M. E., Hu, Y., Jacobson, M. W., Lehmann, M., Fueglistaller, R., Huber, P., Baturin, P., Wang, A. S., Ferguson, D., Harris, T., Morf, D., Berbeco, et al
2019
 - **Characterizing a novel scintillating glass for application to megavoltage cone-beam computed tomography** *MEDICAL PHYSICS*
Hu, Y., Shedlock, D., Wang, A., Rottmann, J., Baturin, P., Myronakis, M., Huber, P., Fueglistaller, R., Shi, M., Morf, D., Star-Lack, J., Berbeco, R. I.
2019; 46 (3): 1323–30
 - **Fast shading correction for cone-beam CT via partitioned tissue classification.** *Physics in medicine and biology*
Shi, L., Wang, A. S., Wei, J., Zhu, L.
2019
 - **A fast, linear Boltzmann transport equationsolver for computed tomography dose calculation (Acuros CTD)** *MEDICAL PHYSICS*
Wang, A., Maslowski, A., Wareing, T., Star-Lack, J., Schmidt, T.
2019; 46 (2): 925–33
 - **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
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- **Dual Energy Imaging with a Dual Layer Flat Panel Detector**
Lu, M., Wang, A., Shapiro, E., Shiroma, A., Zhang, J., Steiger, J., Star-Lack, J., Schmidt, T. G., Chen, G. H., Bosmans, H.
SPIE-INT SOC OPTICAL ENGINEERING.2019
- **Toward quantitative short-scan cone beam CT using shift-invariant filtered-backprojection with equal weighting and image domain shading correction**
Shi, L., Zhu, L., Wang, A., Matej, S., Metzler, S. D.
SPIE-INT SOC OPTICAL ENGINEERING.2019
- **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
- **Feasibility of closed-MLC tracking using high sensitivity and multi-layer electronic portal imagers** *PHYSICS IN MEDICINE AND BIOLOGY*
Hu, Y., Jacobson, M. W., Shi, M., Myronakis, M., Wang, A., Baturin, P., Huber, P., Fueglistaller, R., Morf, D., Star-Lack, J., Berbeco, R.
2018; 63 (23): 235030
- **Investigation of combined kV/MV CBCT imaging with a high-DQE MV detector.** *Medical physics*
Lindsay, C., Bazalova-Carter, M., Wang, A., Shedlock, D., Wu, M., Newson, M., Xing, L., Ansbacher, W., Fahrig, R., Star-Lack, J.
2018
- **A modified McKinnon-Bates (MKB) algorithm for improved 4D cone-beam computed tomography (CBCT) of the lung** *MEDICAL PHYSICS*
Star-Lack, J., Sun, M., Oelhafen, M., Berkus, T., Pavkovich, J., Brehm, M., Arbeit, M., Paysan, P., Wang, A., Munro, P., Seghers, D., Carvalho, L., Verbakel, et al
2018; 45 (8): 3783–99
- **Physics considerations in MV-CBCT multi-layer imager design** *PHYSICS IN MEDICINE AND BIOLOGY*
Hu, Y., Fueglistaller, R., Myronakis, M., Rottmann, J., Wang, A., Shedlock, D., Morf, D., Baturin, P., Huber, P., Star-Lack, J., Berbeco, R.
2018; 63 (12): 125016
- **Multi-layer imager design for mega-voltage spectral imaging** *PHYSICS IN MEDICINE AND BIOLOGY*
Myronakis, M., Hu, Y., Fueglistaller, R., Wang, A., Baturin, P., Huber, P., Morf, D., Star-Lack, J., Berbeco, R.
2018; 63 (10): 105002
- **Acuros CTS: A fast, linear Boltzmann transport equation solver for computed tomography scatter - Part I: Core algorithms and validation** *MEDICAL PHYSICS*
Maslowski, A., Wang, A., Sun, M., Wareing, T., Davis, I., Star-Lack, J.
2018; 45 (5): 1899–1913
- **Acuros CTS: A fast, linear Boltzmann transport equation solver for computed tomography scatter - Part II: System modeling, scatter correction, and optimization** *MEDICAL PHYSICS*
Wang, A., Maslowski, A., Messmer, P., Lehmann, M., Strzelecki, A., Yu, E., Paysan, P., Brehm, M., Munro, P., Star-Lack, J., Seghers, D.
2018; 45 (5): 1914–25
- **Leveraging multi-layer imager detector design to improve low-dose performance for megavoltage cone-beam computed tomography** *PHYSICS IN MEDICINE AND BIOLOGY*
Hu, Y., Rottmann, J., Fueglistaller, R., Myronakis, M., Wang, A., Huber, P., Shedlock, D., Morf, D., Baturin, P., Star-Lack, J., Berbeco, R.
2018; 63 (3): 035022
- **Spectral imaging using clinical megavoltage beams and a novel multi-layer imager** *PHYSICS IN MEDICINE AND BIOLOGY*
Myronakis, M., Fueglistaller, R., Rottmann, J., Hu, Y., Wang, A., Baturin, P., Huber, P., Morf, D., Star-Lack, J., Berbeco, R.
2017; 62 (23): 9127–39
- **A novel method for quantification of beam's-eye-view tumor tracking performance** *MEDICAL PHYSICS*
Hu, Y., Myronakis, M., Rottmann, J., Wang, A., Morf, D., Shedlock, D., Baturin, P., Star-Lack, J., Berbeco, R.
2017; 44 (11): 5650–59
- **A novel multilayer MV imager computational model for component optimization** *MEDICAL PHYSICS*
Myronakis, M., Star-Lack, J., Baturin, P., Rottmann, J., Morf, D., Wang, A., Hu, Y., Shedlock, D., Berbeco, R. I.
2017; 44 (8): 4213–22
- **Accuracy of patient-specific organ dose estimates obtained using an automated image segmentation algorithm** *JOURNAL OF MEDICAL IMAGING*

- Schmidt, T., Wang, A. S., Coradi, T., Haas, B., Star-Lack, J.
2016; 3 (4): 043502
- **Non-local total-variation (NLTV) minimization combined with reweighted L1-norm for compressed sensing CT reconstruction** *PHYSICS IN MEDICINE AND BIOLOGY*
Kim, H., Chen, J., Wang, A., Chuang, C., Held, M., Pouliot, J.
2016; 61 (18): 6878–91
 - **Striped Ratio Grids for Scatter Estimation**
Hsieh, S. S., Wang, A. S., Star-Lack, J., Kontos, D., Flohr, T. G., Lo, J. Y.
SPIE-INT SOC OPTICAL ENGINEERING.2016
 - **Accuracy of patient specific organ-dose estimates obtained using an automated image segmentation algorithm**
Schmidt, T., Wang, A., Coradi, T., Haas, B., Star-Lack, J., Kontos, D., Flohr, T. G., Lo, J. Y.
SPIE-INT SOC OPTICAL ENGINEERING.2016
 - **A piecewise-focused high DQE detector for MV imaging** *MEDICAL PHYSICS*
Star-Lack, J., Shedlock, D., Swahn, D., Humber, D., Wang, A., Hirsh, H., Zentai, G., Sawkey, D., Kruger, I., Sun, M., Abel, E., Virshup, G., Shin, et al
2015; 42 (9): 5084-5099
 - **Accelerated statistical reconstruction for C-arm cone-beam CT using Nesterov's method** *MEDICAL PHYSICS*
Wang, A. S., Stayman, J., Otake, Y., Vogt, S., Kleinszig, G., Siewerdsen, J. H.
2015; 42 (5): 2699–2708
 - **Automatic Localization of Target Vertebrae in Spine Surgery** *SPINE*
Lo, S. L., Otake, Y., Puvanesarajah, V., Wang, A. S., Uneri, A., De Silva, T., Vogt, S., Kleinszig, G., Elder, B. D., Goodwin, C., Kosztowski, T. A., Liauw, J. A., Groves, et al
2015; 40 (8): E476–E483
 - **3D-2D registration in mobile radiographs: algorithm development and preliminary clinical evaluation** *PHYSICS IN MEDICINE AND BIOLOGY*
Otake, Y., Wang, A. S., Uneri, A., Kleinszig, G., Vogt, S., Aytun, N., Lo, S. L., Wolinsky, J., Gokaslan, Z. L., Siewerdsen, J. H.
2015; 60 (5): 2075–90
 - **Asymmetric Scatter Kernels for Software-Based Scatter Correction of Gridless Mammography**
Wang, A., Shapiro, E., Yoon, S., Ganguly, A., Proano, C., Colbeth, R., Lehto, E., Star-Lack, J., Hoeschen, C., Kontos, D.
SPIE-INT SOC OPTICAL ENGINEERING.2015
 - **Known-Component 3D-2D Registration for Image Guidance and Quality Assurance in Spine Surgery Pedicle Screw Placement**
Uneri, A., Stayman, J. W., De Silva, T., Wang, A. S., Kleinszig, G., Vogt, S., Khanna, A. J., Wolinsky, J., Gokaslan, Z. L., Siewerdsen, J. H., Yaniv, Z. R., Webster, R. J.
SPIE-INT SOC OPTICAL ENGINEERING.2015
 - **Evaluation of low-dose limits in 3D-2D rigid registration for surgical guidance**
Uneri, A., Wang, A. S., Otake, Y., Kleinszig, G., Vogt, S., Khanna, A. J., Gallia, G. L., Gokaslan, Z. L., Siewerdsen, J. H.
IOP PUBLISHING LTD.2014: 5329–45
 - **dPIRPLE: a joint estimation framework for deformable registration and penalized-likelihood CT image reconstruction using prior images** *PHYSICS IN MEDICINE AND BIOLOGY*
Dang, H., Wang, A. S., Sussman, M. S., Siewerdsen, J. H., Stayman, J. W.
2014; 59 (17): 4799–4826
 - **Deformable image registration with local rigidity constraints for cone-beam CT-guided spine surgery** *PHYSICS IN MEDICINE AND BIOLOGY*
Reaungamornrat, S., Wang, A. S., Uneri, A., Otake, Y., Khanna, A. J., Siewerdsen, J. H.
2014; 59 (14): 3761–87
 - **Low-dose preview for patient-specific, task-specific technique selection in cone-beam CT** *MEDICAL PHYSICS*
Wang, A. S., Stayman, J., Otake, Y., Vogt, S., Kleinszig, G., Khanna, A., Gallia, G. L., Siewerdsen, J. H.
2014; 41 (7): 071915
 - **Efficacy of fixed filtration for rapid kVp-switching dual energy x-ray systems.** *Medical physics*
Yao, Y., Wang, A. S., Pelc, N. J.

2014; 41 (3): 031914-?

- **Soft-tissue imaging with C-arm cone-beam CT using statistical reconstruction** *PHYSICS IN MEDICINE AND BIOLOGY*
Wang, A. S., Stayman, J., Otake, Y., Kleinszig, G., Vogt, S., Gallia, G. L., Khanna, A., Siewerdsen, J. H.
2014; 59 (4): 1005–26
- **Dual-energy cone-beam CT with a flat-panel detector: Effect of reconstruction algorithm on material classification** *MEDICAL PHYSICS*
Zbijewski, W., Gang, G. J., Xu, J., Wang, A. S., Stayman, J. W., Taguchi, K., Carrino, J. A., Siewerdsen, J. H.
2014; 41 (2): 021908
- **3D-2D registration for surgical guidance: effect of projection view angles on registration accuracy** *PHYSICS IN MEDICINE AND BIOLOGY*
Uneri, A., Otake, Y., Wang, A. S., Kleinszig, G., Vogt, S., Khanna, A. J., Siewerdsen, J. H.
2014; 59 (2): 271–87
- **Dual-Projection 3D-2D Registration for Surgical Guidance: Preclinical Evaluation of Performance and Minimum Angular Separation**
Uneri, A., Otake, Y., Wang, A. S., Kleinszig, G., Vogt, S., Gallia, G. L., Rigamonti, D., Wolinsky, J., Gokaslan, Z. L., Khanna, A. J., Siewerdsen, J. H., Yaniv, Z. R., Holmes, et al
SPIE-INT SOC OPTICAL ENGINEERING.2014
- **Patient-Specific Minimum-Dose Imaging Protocols for Statistical Image Reconstruction in C-arm Cone-Beam CT Using Correlated Noise Injection**
Wang, A. S., Stayman, J. W., Otake, Y., Khanna, A. J., Gallia, G. L., Siewerdsen, J. H., Whiting, B. R., Hoeschen, C., Kontos, D.
SPIE-INT SOC OPTICAL ENGINEERING.2014
- **Deformable Registration for Image-Guided Spine Surgery: Preserving Rigid Body Vertebral Morphology in Free-Form Transformations**
Reaungamornrat, S., Wang, A. S., Uneri, A., Otake, Y., Zhao, Z., Khanna, A. J., Siewerdsen, J. H., Yaniv, Z. R., Holmes, D. R.
SPIE-INT SOC OPTICAL ENGINEERING.2014
- **Robust 3D-2D image registration: application to spine interventions and vertebral labeling in the presence of anatomical deformation** *PHYSICS IN MEDICINE AND BIOLOGY*
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