

Taly Gilat Schmidt, PhD

Current Positions

Associate Professor, Department of Biomedical Engineering, Marquette University and
Medical College of Wisconsin

Adjunct Assistant Professor, Department of Radiology, Medical College of Wisconsin

Contact Information

Marquette University

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EDUCATION

Stanford University, Stanford, California

Ph.D., Electrical Engineering, September 2005

M.S., Electrical Engineering, June 2002

University of Illinois at Urbana Champaign, Champaign, Illinois

B.S., Electrical Engineering, May 1998

ACADEMIC, SCHOLARLY, AND PROFESSIONAL EXPERIENCE

Associate Professor	Department of Biomedical Engineering Marquette University and Medical College of Wisconsin, Milwaukee, Wisconsin	2016 - present
Associate Professor	Department of Biomedical Engineering Marquette University, Milwaukee, Wisconsin	2014-2016
Assistant Professor	Department of Biomedical Engineering Marquette University, Milwaukee, Wisconsin	2006-2014
Adjunct Assistant Professor	Biotechnology and Bioengineering Center Medical College of Wisconsin, Milwaukee, Wisconsin	2014-2016
Adjunct Assistant Professor	Department of Radiology Medical College of Wisconsin, Milwaukee, Wisconsin	2006-present
Research Assistant	Radiological Sciences Laboratory Stanford University, Stanford, California	2000-2005

Electrical Engineer Edison Engineering Development Program 1998-2000
GE Healthcare, Waukesha, Wisconsin

PROFESSIONAL ACTIVITIES AND SERVICE

Memberships in Professional Societies

Institute of Electrical and Electronics Engineers (IEEE)
American Association of Physicists in Medicine (AAPM)

Peer-Reviewed Journal Affiliations

Associate Editor for *IEEE Transactions on Medical Imaging* (2015 – present)

Manuscripts Reviewed for: *IEEE Transactions on Medical Imaging, IEEE Transactions on Image Processing, IEEE Transactions on Nuclear Science, IEEE Transactions on Biomedical Engineering, Medical Physics, Physics in Medicine and Biology, PLoS One, Journal of Medical Imaging, International Journal of Biomedical Imaging, Medical and Biological Engineering and Computing, Applied Radiation and Isotopes, Journal of Applied Physics. Physica Medica*

Guest Associate Editor for *Medical Physics*

Invited Scientific Service

Charter Member of National Institutes of Health Imaging Technology Development Grant Review Study Section (2019-2024)

Charter Member of National Institutes of Health Biomedical Imaging Technology A Grant Review Study Section (2018-2019)

Grant Reviewer for National Institutes of Health (15 ad hoc study section meetings)

Session Chair, RSNA Annual Meeting (2017)

Chair, SPIE Medical Imaging: Physics of Medical Imaging Conference (2018-2019)

Co-Chair, SPIE Medical Imaging: Physics of Medical Imaging Conference (2017)

Reviewer of National Academies Report on “Airport Passenger Screening Using Millimeter Wave Machines: Compliance with Guidelines” (2017)

Organizing Committee, Abstract Reviewer, and Session Chair, SPIE Medical Imaging: Medical Imaging Physics Conference (2011- present)

Session Chair, AAPM Annual Meeting (2017)

Abstract Reviewer, AAPM Annual Meeting (2013 - present)

Scientific Committee, CT Meeting (2017-2018)

AAPM Research Committee (2014 – 2016)

HONORS AND AWARDS

Marquette University Faculty All Star Award, 2019

Marquette University Way Klingler Sabbatical Award, 2016

Featured Article: *Physics in Medicine and Biology*

T. G. Schmidt, K. C. Zimmerman, E. Y. Sidky, "The effects of extending the spectral information acquired by a photon counting detector for spectral CT," 60 (4), pp. 1583–1600, (2015).

Editor's Pick: *Medical Physics*

M. E. Hoppe, D. Gandhi, G. M. Stevens, W. D. Foley, T. G. Schmidt, "The effects of gantry tilt on breast dose and image noise in cardiac CT," 40, pp. 121905:1–8 (2013).

W. Ha, E. Y. Sidky, R. F. Barber, **T. G. Schmidt**, X. Pan "Estimating the spectrum in computed tomography via Kullback-Leibler divergence constrained optimization," 46 (1), pp. 81-92, (2019).

A. S. Wang, A. Maslowski, T. Wareing, J. Star-Lack, **T. G. Schmidt**, "A fast, linear Boltzmann transport equation solver for computed tomography dose calculation (Acuros CTD)," 46 (2), pp. 925-933, (2019).

College of Engineering Outstanding Researcher Award, 2013

Radiological Society of North America Research Trainee Prize, 2005

National Science Foundation Graduate Research Fellowship, 2000

PUBLICATIONS (* denotes student)

Refereed Journals

1. K. C. Zimmerman*, G. Sharma, A. K. Parchur, A. Joshi, **T. G. Schmidt**, "A neural network estimator for K-edge spectral CT imaging," *Medical Physics* (in review).
2. B. M. Rizzo*, E. Y. Sidky, S. H. Audi, **T. G. Schmidt**, E. R. Jacobs, A. V. Clough, 3D Reconstruction for Few-View Multi-pinhole Single Photon Emission Computed Tomography (SPECT) using TV-Penalized Fidelity Optimization," *IEEE Transactions on Medical Imaging* (in review).
3. A. S. Wang, A. Maslowski, T. Wareing, J. Star-Lack, **T. G. Schmidt**, "A fast, linear Boltzmann transport equation solver for computed tomography dose calculation (Acuros CTD)," *Medical Physics*, 46 (2), pp. 925-933, 2019. (**Editor's Pick designation**)
4. **T. G. Schmidt**, R. E. Linderman, M. R. Strampe, T. Y. P. Chui, R. B. Rosen, J. Carroll, "The Utility of Frame Averaging for Automated Algorithms in Analyzing Retinal Vascular Biomarkers in AngioVue OCTA," *Trans. Vis. Sci. Tech.*, 8 (1):10, 2019.
5. P. Khobragade*, F. Rucpich, J. Fan, , D. J. Crotty, **T. G. Schmidt**, "CT automated exposure control using a generalized detectability index," *Medical Physics*, 46 (1), pp. 141-151, 2019.
6. W. Ha, E. Y. Sidky, R. F. Barber, **T. G. Schmidt**, X. Pan "Estimating the spectrum in computed tomography via Kullback-Leibler divergence constrained optimization," *Medical Physics*, 46 (1), pp. 81-92, 2019. (**Editor's Pick designation**)

7. H. Ma*, E. Gros, S. Bagniski, Z. R. Laste, N. M. Kulkarni, D. Okerlund, **T. G. Schmidt**, "Automated quantification and evaluation of motion artifact on coronary CT angiography images," *Medical Physics*, 45 (12), pp. 5494-5508, 2018.
8. G. Noid, D. Schott, N. Mistry, Y. Liu, **T. G. Schmidt**, J. R. Robbins, X. A. Li, "Technical Note: Enhancing soft tissue contrast and radiation-induced image changes with dual-energy CT for radiation therapy," *Medical Physics*, 45 (9), pp. 4238-4245, 2018.
9. P. Khobragade*, J. Fan, F. Rupcich, D. J. Crotty, **T. G. Schmidt**, "Application of fractal dimension for quantifying noise texture in computed tomography images," *Medical Physics*, 45 (8), pp. 3563-3573, 2018.
10. H. Ma*, E. Gros, A. Szabo, S. Bagniski, Z. R. Laste, N. M. Kulkarni, D. Okerlund, **T. G. Schmidt**, "Evaluation of Motion Artifact Metrics for Coronary CT Angiography," *Medical Physics*, 45 (2), pp. 687-702, 2018.
11. **T. G. Schmidt**, R. F. Barber, E. Y. Sidky, "A Spectral CT Method to Directly Estimate Basis Material Maps From Experimental Photon-Counting Data," *IEEE Transactions on Medical Imaging*, 36 (9), pp. 1808-1819, 2017.
12. J. A. Cross*, B. D. McHenry, R. Molthen, E. Exten, **T. G. Schmidt**, G. F. Harris, "Biplane fluoroscopy for hindfoot motion analysis during gait: A model-based evaluation," *Medical Engineering & Physics*, 43 (5), pp. 118-123, 2017.
13. **T. G. Schmidt**, A. S. Wang, B. Haas, T. Coradi, J. Star-Lack, "Accuracy of patientspecific organ dose estimates obtained using an automated image segmentation algorithm," *Journal of Medical Imaging*, 3 (4), pp. 043502, 2016.
14. R. F. Barber, E. Y. Sidky, **T. G. Schmidt**, X. Pan, "An algorithm for constrained one-step inversion of spectral CT data," *Physics in Medicine and Biology*, 61 (10), pp. 3784-3818, 2016.
15. D. Stassi*, S. Dutta, H. Ma, A. Soderman, D. Pazzani, E. Gros, D. Okerlund, and **T.G. Schmidt**, "Automated Selection of the Optimal Cardiac Phase for Single-Beat Coronary CT Angiography Reconstruction," *Medical Physics*, 43, (1), pp. 324-335, 2016.
16. J. A. Cross*, B. D. McHenry, **T. G. Schmidt**, "Quantifying cross-scatter contamination in biplane fluoroscopy motion analysis systems," *Journal of Medical Imaging*, 2 (4), pp. 043503, 2015.
17. D. Gandhi*, D. J. Crotty, G. M. Stevens, **T. G. Schmidt**, "Technical Note: The effects of organ-based tube current modulation on radiation dose and image quality in computed tomography imaging," *Medical Physics*, 42 (11), pp. 6572-6578, 2015.
18. K. C. Zimmerman*, **T. G. Schmidt**, "Experimental comparison of empirical material decomposition methods for spectral CT," *Physics in Medicine and Biology*, 60 (8), pp. 3175-3191, 2015.
19. **T. G. Schmidt**, K. C. Zimmerman, E. Y. Sidky, "The effects of extending the spectral information acquired by a photon-counting detector for spectral CT," *Physics in Medicine and Biology*, 60 (4), pp. 1583-1600, 2015. (**Featured Article designation**).
20. M. E. Hoppe*, D. Gandhi, G. M. Stevens, W.D. Foley, **T. G. Schmidt**, "Investigation of tilted-gantry acquisition for reducing breast dose in cardiac CT," *Medical Physics*, 40, pp. 121905:1-8, 2013 (**Editor's Pick designation**).

21. P. A. Wolf*, J. H Jorgensen, **T. G. Schmidt**, E.Y Sidky, "Few-view single photon emission computed tomography (SPECT) reconstruction based on a blurred piecewise constant object model," *Physics in Medicine and Biology*, 58 (16), pp. 5629-5652, 2013.
22. F. Rupcich*, A. Badal-Solar, L. M. Popescu, I. Kyprianou, **T.G. Schmidt**, "Reducing radiation dose to the female breast during CT coronary angiography: A simulation study comparing breast shielding, angular tube current modulation, reduced kV, and partial angle protocols using an unknown-location signal-detectability metric," *Medical Physics*, 40 (8), pp. 081921, 2013.
23. D. Ma*, P. A. Wolf, A. V. Clough, **T. G. Schmidt**, "The Performance of MLEM for Dynamic Imaging From Simulated Few-View, Multi-Pinhole SPECT," *IEEE Tran. Nuc. Sci.*, 60 (1), pp. 115-123, 2013.
24. F. Rupcich*, A. Badal-Solar, I. Kyprianou, **T.G. Schmidt**, "A database for estimating organ dose for coronary angiography and brain perfusion CT scans for arbitrary spectra and angular tube current modulation," *Medical Physics*, 39 (6), pp. 5336-5346, 2012.
25. M. Hoppe*, **T.G. Schmidt**, "Estimation of Organ and Effective Dose due to Compton Backscatter Security Scans," *Medical Physics*, 39 (6), pp. 3396-3403, 2012.
26. B. Kalinosky*, J.M. Sabol, B. Heckel, K. Piacsek, **T.G. Schmidt**, "Quantifying the tibiofemoral joint space using x-ray tomosynthesis," *Medical Physics*, pp. 6672-6682, 2011.
27. **T.G. Schmidt**, F. Pektas*, "Region-of-interest material decomposition from truncated energy-resolved CT," *Medical Physics*, 38, (10), pp.5657-5666, 2011.
28. **T. G. Schmidt**, "What is inverse-geometry CT?" *Journal of Cardiovascular Computed Tomography*, 5 (3), 2011.
29. **T. G. Schmidt**, "Breast CT: Current Status and New Directions," *Current Medical Imaging Reviews*, 6 (2), pp. 61-71, 2010.
30. **T. G. Schmidt**, "CT energy weighting in the presence of scatter and limited energy resolution," *Medical Physics*, 37 (3), pp. 1056-1067, 2010.
31. **T. G. Schmidt**, "Optimal image-based weighting for energy-resolved CT," *Medical Physics*, 36 (6), pp. 3018-3027, 2009.
32. R. A. Bhagtani*, **T. G. Schmidt**, "Simulated scatter performance of an inverse-geometry dedicated breast CT system," *Medical Physics*, 36 (3), pp. 788-796, 2009.
33. **T. G. Schmidt**, N. R. Bennett, S. R. Mazin, J. Star-Lack, E. G. Solomon, R. Fahrig, N. J. Pelc, "A prototype table-top inverse-geometry volumetric CT system," *Medical Physics*, 33, pp. 1867-1878, 2006.
34. **T. G. Schmidt**, R. Fahrig, N. J. Pelc, "A three-dimensional reconstruction algorithm for an inverse-geometry volumetric CT system," *Medical Physics*, 32, pp. 3234-3245, 2005.
35. **T. G. Schmidt**, R. Fahrig, E. G. Solomon, N. J. Pelc, "An inverse-geometry volumetric CT system with a large-area scanned source: A feasibility study," *Medical Physics*, 31, pp. 2623-2627, 2004.

International Conference Proceedings (refereed conference, non-refereed proceedings)

1. P. Jenkins*, **T. G. Schmidt**, "Experimental study of neural network material decomposition to account for pulse-pileup effects in photon-counting spectral CT," *Proc. SPIE 10948, Medical Imaging 2019: Physics of Medical Imaging*, pp. 109481Y, 2019.

2. H. Ma, M. Wu, C. Hammond, **T. G. Schmidt**, "Using one test bolus to monitor bolus arriving at two locations in CT angiography runoff scans: a feasibility simulation study," *Proc. SPIE 10948, Medical Imaging 2019: Physics of Medical Imaging*, pp. 109482K, 2019.
3. P. Khobragade*, J. Fan, F. Rucpich, D. J. Crotty, **T. G. Schmidt**, "Automated exposure control using a task-based image quality metric," in *Medical Imaging 2018: Physics of Medical Imaging*, Proc. SPIE 10573, pp. 1057316, 2018.
4. **T. G. Schmidt**, R. F. Barber, E. Y. Sidky, "Spectral CT metal artifact reduction with an optimization-based reconstruction algorithm," in *Medical Imaging 2017: Physics of Medical Imaging*, Proc. SPIE 10132, pp. 101321B, 2017.
5. P. Khobragade*, J. Fan, F. Rucpich, D. J. Crotty, **T. G. Schmidt**, "Fractal dimension metric for quantifying noise texture of computed tomography images," in *Medical Imaging 2017: Image Perception, Observer Performance, and Technology Assessment*, Proc. SPIE 10136, pp. 101361F, 2017.
6. P. Khobragade*, J. Fan, F. Rucpich, D. J. Crotty, **T. G. Schmidt**, "Effects of window width and window level adjustment on detection tasks in computed tomography images," in *Medical Imaging 2017: Image Perception, Observer Performance, and Technology Assessment*, Proc. SPIE 10136, pp. 101361G, 2017.
7. **T. G. Schmidt**, A. S. Wang, T. Coradi, B. Haas, J. M. Star-Lack, "Accuracy of patient specific organ dose estimates obtained using an automated image segmentation algorithm," in *Medical Imaging 2016: Physics of Medical Imaging*, Proc. SPIE 9783, pp. 978311, 2016.
8. K. R. Zimmerman* and **T. G. Schmidt**, "Comparison of quantitative k-edge empirical estimators using an energy-resolved photon-counting detector," in *Medical Imaging 2016: Physics of Medical Imaging*, Proc. SPIE 9783, pp. 97831S, 2016.
9. P. Khobragade, J. Fan, F. Rucpich, D. J. Crotty, **T. G. Schmidt**, "Task-based detectability comparison of exponential transformation of free-response operating characteristic (EFROC) curve and channelized Hotelling observer (CHO)," in *Medical Imaging 2016: Image Perception, Observer Performance, and Technology Assessment*, Proc. SPIE 9787, pp. 97870C, 2016.
10. **T. G. Schmidt**, E. Y. Sidky, "Investigation of a one-step spectral CT reconstruction algorithm for direct inversion into basis material images," in *Medical Imaging 2015: Physics of Medical Imaging*, Proc. SPIE 9412, pp. 94124Y, 2015.
11. A. A. Sanchez*, E. Y. Sidky, **T. G. Schmidt**, X. Pan, "Evaluation of spectral CT data acquisition methods via non-stochastic variance maps," in *Medical Imaging 2015: Physics of Medical Imaging*, Proc. SPIE 9412, pp. 941211, 2015.
12. **T. G. Schmidt**, K. C. Zimmerman, E. Y. Sidky, "Effects of energy-bin acquisition methods on noise properties in photon-counting spectral CT," in *Medical Imaging 2014: Physics of Medical Imaging*, Proc. SPIE 9033, pp. 90331B, 2014.
13. K. C. Zimmerman*, E. Y. Sidky, **T. G. Schmidt**, "Experimental study of two material decomposition methods using multi-bin photon counting detectors," in *Medical Imaging 2014: Physics of Medical Imaging*, Proc. SPIE 9033, pp. 90333G, 2014.

14. F. Rucpich*, **T. G. Schmidt**, "Experimental study of optimal energy weighting in energyresolved CT using a CZT detector," in *Medical Imaging 2013: Physics of Medical Imaging*, Proc. SPIE 8668, pp. 86681X, 2013.
15. J. A. Cross*, B. McHenry, **T. G. Schmidt**, "Quantifying cross scatter in biplane fluoroscopy motion analysis systems," in *Medical Imaging 2013: Physics of Medical Imaging*, Proc. SPIE 8668, pp. 86685X 2013.
16. P. A. Wolf*, J.H. Jorgensen, **T.G. Schmidt**, and E.Y. Sidky, "A First-Order Primal-Dual Reconstruction Algorithm for Few-View SPECT," In *Proceedings of the IEEE Nuclear Science Symposium / Medical Imaging Conference*, 2012.
17. **T. G. Schmidt**, "An empirical method for correcting the detector spectral response in energy-resolved CT," in *Medical Imaging 2012: Physics of Medical Imaging*, Proc. SPIE 8313, 831312, SPIE 2012.
18. P. A. Wolf*, E.Y. Sidky, and **T.G. Schmidt**. "A Compressed Sensing Algorithm for Sparse-view Pinhole Single Photon Emission Computed Tomography," In *Proceedings of the IEEE Nuclear Science Symposium / Medical Imaging Conference*, 2011.
19. F. Rucpich*, A. Badal, I. Kyprianou, **T. G. Schmidt**, "Energy deposition in the breast during CT scanning: quantification and implications for dose reduction," in *Medical Imaging 2010: Physics of Medical Imaging*, Proc. SPIE 7961, 796128, SPIE 2011.
20. D. Ma*, A.V. Clough, **T. G. Schmidt**, "Multi-pinhole dynamic SPECT imaging: simulation and system optimization," in *Medical Imaging 2010: Physics of Medical Imaging*, Proc. SPIE 7622, 76220U, SPIE 2010.
21. **T. G. Schmidt**, "Preliminary feasibility of dedicated breast CT with an inverse geometry," in *Medical Imaging 2009: Physics of Medical Imaging*, 7258, 72582Y1-6, SPIE 2009.
22. **T. G. Schmidt**, R. Fahrig, N. J. Pelc, "Noise simulations for an inverse-geometry volumetric CT system," in *Medical Imaging 2004: Physics of Medical Imaging*, 5368, pp. 420-427, Proc. SPIE 2005.
23. S. R. Mazin, **T. G. Schmidt**, E. G. Solomon, R. Fahrig, N. J. Pelc, "Geometry analysis of an inverse- geometry volumetric CT system with multiple detector arrays," in *Medical Imaging 2004: Physics of Medical Imaging*, 5368, pp. 320-329, Proc. SPIE 2004.
24. **T. Gilat**, R. Fahrig, N. J. Pelc, "Three-dimensional reconstruction algorithm for a reversegeometry volumetric CT system with a large-array scanned source," in *Medical Imaging 2003: Physics of Medical Imaging*, 5030, pp. 103-111, Proc. SPIE 2003.

International Refereed Conference Abstracts

1. **T. G. Schmidt**, R. F. Barber, E. Y. Sidky, "Spectral CT Metal Artifact Reduction," The 103rd Annual Meeting of the Radiological Society of North America, Chicago, IL 2018.
2. A. S. Wang, **T. G. Schmidt**, J. Star-Lack, "CT Dose Calculation Via a Fast, Deterministic Boltzmann Transport Equation Solver: Validation Against AAPM Task Group 195 Monte Carlo Reference Data," American Association of Physicists in Medicine Annual Meeting, Nashville, TN, 2018.
3. **T. G. Schmidt**, R. F. Barber, E. Y. Sidky, "Experimental feasibility of quantitative K-edge material decomposition using an optimization-based reconstruction method with

- empirical spectral modeling,” 4th Workshop on on Medical Applications of Spectroscopic X-ray Detectors, CERN, Geneva, Switzerland 2017. (By invitation only).
4. **T. G. Schmidt**, R. E. Linderman, M. R. Strampe, J. A. Carroll, “Frame averaging and automated segmentation technique for foveal avascular zone quantification with optical coherence tomography angiography,” Association for Research in Vision and Ophthalmology Annual Meeting, Baltimore, MD, 2017.
 5. D. Schott, W. A. Hall, **T. G. Schmidt**, X. Chen, S. Klawikowski, G. Noid, P. M. Knechtges, B. A. Erickson, X. Li, “Machine Learning and Texture Analysis for Assessing Spatial Tumor Response Based On Daily CTs During Radiation Therapy for Pancreatic Adenocarcinoma,” American Association of Physicists in Medicine Annual Meeting, Denver, CO, 2017.
 6. H. Ma*, E. Gros, D. Okerlund, **T. G. Schmidt**, “Automated Coronary Artery Motion Artifact Evaluation and Correction Identification for CT Angiography Images,” The 102nd Annual Meeting of the Radiological Society of North America, Chicago, IL 2016.
 7. D. Schott, **T. G. Schmidt**, X. Chen, S. Klawikowski, G. Noid, E. Dalah, X. Li, “Statistical Segmentation On Quantitative CT for Assessing Spatial Tumor Response During Radiation Therapy Delivery,” American Association of Physicists in Medicine Annual Meeting, Washington DC, 2016.
 8. D. Schott, W. A. Hall, **T. G. Schmidt**, E. Dalah, K. Oshima, E. S. Paulson, P. M. Knechtges, B. A. Erickson, A. Li, “Correlation of ADC Texture With Treatment Response for Chemoradiation Therapy of Pancreatic Cancer,” 2016 Annual Meeting American Society for Radiation Oncology, Boston, MA, 2016.
 9. E. Y. Sidky, **T. G. Schmidt**, R. F. Barber, W. Ha, X. Pan, “Simultaneous spectral scaling and basis material map reconstruction for spectral CT with photon-counting detectors,” 4th International Conference on Image Formation in X-ray Computed Tomography, Bamberg, Germany 2016.
 10. C. Yang, **T. G. Schmidt**, G. Noid, E. Dalah, E. Paulson, X. A. Li, “Auto-Segmentation of Regions with Differentiating CT Numbers for Treatment Response Assessment,” American Association of Physicists in Medicine Annual Meeting, Anaheim, CA, 2015.
 11. A. S. Wang, A. Maslowski, T. Wareing, **T. G. Schmidt**, and J. Star-Lack, “Patient Specific Dose Maps for CT Scans Using a Fast, Deterministic Boltzmann Transport Equation Solver,” American Association of Physicists in Medicine Annual Meeting, Anaheim, CA, 2015.
 12. **T. G. Schmidt**, R. F. Barber, E. Y. Sidky, “Experimental investigation of a one-step material decomposition reconstruction algorithm for photon-counting spectral CT,” 3rd Workshop on on Medical Applications of Spectroscopic X-ray Detectors, CERN, Geneva, Switzerland 2015 (By invitation only).
 13. D. Stassi*, S. Dutta, A. Soderman, D. Pazzani, D. Okerlund, and **T.G. Schmidt**, “Automated selection of the optimal cardiac phase for single-beat coronary CT angiography,” The 100th Annual Meeting of the Radiological Society of North America, Chicago, IL 2014.
 14. D. Gandhi*, D. J. Crotty, G. M. Stevens, and **T.G. Schmidt**, “Radiation dose and image quality performance of organ-based tube current modulation for head and chest CT scans,” The 100th Annual Meeting of the Radiological Society of North America, Chicago, IL 2014.

15. D. Stassi*, S. Dutta, A. Soderman, D. Pazzani, D. Okerlund, and **T.G. Schmidt**, "Performance of an Automated Algorithm for Selecting the Optimal Cardiac Phase for Single-Beat CCTA," Society of Cardiovascular Computed Tomography Annual Meeting, San Diego, CA 2014.
16. K. C. Zimmerman* and **T.G. Schmidt**, "Experimental investigation of multi-energy CT material decomposition using artificial neural networks," The Third Annual Meeting on CT Image Formation, Salt Lake City, UT, 2014.
17. E.Y. Sidky, **T.G. Schmidt**, and X. Pan "Optimization-based direct inversion of spectral CT data into a materials decomposition," The Third Annual Meeting on CT Image Formation, Salt Lake City, UT, 2014.
18. **T.G. Schmidt** and K. C. Zimmerman*, "Experimental Investigation of Hybrid Region-of-Interest Spectral CT Imaging with a Photon-Counting Detector," The Third Annual Meeting on CT Image Formation, Salt Lake City, UT, 2014.
19. **T.G. Schmidt**, "Investigation of Simulation Software for Explosive-Detection CT Imaging," The Third Annual Meeting on CT Image Formation, Salt Lake City, UT, 2014.
20. D. Gandhi*, D. Crotty, G. M. Stevens, and **T.G. Schmidt**, "Experimental Quantification of the Effects of Organ-based Tube Current Modulation on Radiation Dose and SNR," The 99th Annual Meeting of the Radiological Society of North America, Chicago, IL 2013.
21. J. A. Cross*, B.. McHenry, G F. Harris, and **T.G. Schmidt**, "Biplane fluoroscopic analysis of the hindfoot using model-based tracking techniques: A static phantom study." American Society of Biomechanics Annual Meeting, Omaha, NE 2013.
22. **T. G. Schmidt**, "Preliminary Investigation of a Bench-Top Energy-Resolved CT system with CZT Detector: Calibrations, Artifacts, and Optimal Energy Weighting," 2nd Workshop on on Medical Applications of Spectroscopic X-ray Detectors, CERN, Geneva, Switzerland 2013 (By invitation only).
23. M.E. Hoppe*, G.M. Stevens, and **T. G. Schmidt**, "Reducing the Dose to Women Receiving Cardiac CT Scans," The 98th Annual Meeting of the Radiological Society of North America, Chicago, IL 2012.
24. F. Rucpich*, A. Badal, I. Kyprianou, and **T. G. Schmidt**, "Reducing Breast Dose During CT: A Unified Study of Dose and Task-based Image Quality," The 98th Annual Meeting of the Radiological Society of North America, Chicago, IL 2012.
25. F. Rucpich*, A. Badal, I. Kyprianou, and **T. G. Schmidt**, "A Comparison of CT Dosereduction Methods with Respect to Breast Dose and a Task-based Image Quality Metric," The 97th Annual Meeting of the Radiological Society of North America, Chicago, IL 2011.
26. M. Hoppe*, **T.G. Schmidt**, "Quantifying the reduction of dose to the breast by tilted gantry acquisition of short-axis cardiac images," The 97th Annual Meeting of the Radiological Society of North America, Chicago, IL 2011.
27. **T.G. Schmidt** and F. Pektas*, "Region-of-Interest Material Decomposition from Truncated Energy-resolved CT," The 97th Annual Meeting of the Radiological Society of North America, Chicago, IL 2011.

28. F. Rupcich*, A. Badal, I. Kyprianou, and **T. G. Schmidt**, "A database for estimating scanner-specific CT dose," AAPM Annual Meeting, American Association of Physicists in Medicine, Vancouver, CA 2011.
29. B. Kalinosky*, J. Sabol, K. Piacsek, B. Heckel, **T.G. Schmidt**, "Automated Quantification of Joint Space in X-ray Tomosynthesis Scans of Knee Osteoarthritis," The 96th Annual Meeting of the Radiological Society of North America, Chicago, IL 2010.
30. D. Ma*, A.V. Clough, **T. G. Schmidt**, "Feasibility of Imaging the First-pass Tracer Uptake in Small-Animal Multi-pinhole SPECT," The 95th Annual Meeting of the Radiological Society of North America, Chicago, IL 2009.
31. R. A. Bhagtani*, **T. G. Schmidt**, "Simulated Scatter Performance of an Inverse Geometry Dedicated Breast CT System," The 94th Annual Meeting of the Radiological Society of North America, Chicago, IL 2008.
32. **T. G. Schmidt**, "The Effects of X-ray Energy Weighting on the Detected Scatter Signal: A Simulation Study," The 94th Annual Meeting of the Radiological Society of North America, Chicago, IL 2008.
33. A. Keely*, I. Kyprianou, R. Jennings, K. Myers, **T. G. Schmidt**, "Phantom development for artifact reduction in cone-beam CT," American Association for Physicists in Medicine Annual Meeting, Minneapolis, MN 2007.
34. **T. G. Schmidt**, N. R. Bennett, S. R. Mazin, J. Star-Lack, E. G. Solomon, N. J. Pelc, "First images from a table-top inverse-geometry volumetric CT with a large-area scanned source," The 90th Annual Meeting of the Radiological Society of North America, Chicago, IL 2004.
35. **T. Gilat**, R. Fahrig, N. J. Pelc, "A 3D Reconstruction Algorithm for an Inverse Geometry CT System with a Large Array Scanned Source," The 89th Annual Meeting of the Radiological Society of North America, Chicago, IL 2003.
36. **T. Gilat**, R. Fahrig, E. G. Solomon, N. J. Pelc, "Volumetric CT with a large-array scanned source," The 88th Annual Meeting of the Radiological Society of North America, Chicago, IL 2002.

INVITED PRESENTATIONS

International

- "Spectral CT Future Directions: Photon Counting," 103rd Annual Meeting of Radiological Society of North America, Advances in CT Systems Refresher Course, Chicago, IL, November 30, 2018.
- "Spectral CT Future Directions: Photon Counting," 102nd Annual Meeting of Radiological Society of North America, Advances in CT Systems Refresher Course, Chicago, IL, November 30, 2017.
- "Quantitative Multi-Energy Computed Tomography: Imaging and Therapy Advancements (MECT Systems Overview and Quantitative Opportunities)," Annual Meeting of the Association of Physicists in Medicine, Denver, CO, August 2, 2017.

- “Photon Counting Detectors and Their Applications in Medical Imaging (Principles, Pitfalls and Progress in Photon-Counting-Detector Technology)” Annual Meeting of the Association of Physicists in Medicine, Denver, CO, August 1, 2017.
- “Spectral CT Future Directions: Photon Counting,” 102nd Annual Meeting of Radiological Society of North America, Advances in CT Systems Refresher Course, Chicago, IL, Dec 1, 2016.
- “Optimization-based reconstruction for Spectral CT Imaging,” at the Imaging 2016 Conference, organized by the KTH Royal Institute of Technology and sponsored by the Royal Swedish Academy of Sciences KVA through its Nobel Institute for Physics, Stockholm, Sweden June 15, 2016.
- “X-ray simulation tools,” Algorithm Development for Security Applications meeting (ADSA12), Boston, MA, May 15 2015.
- “Reducing radiation dose and improving image quality for next-generation CT imaging,” DIBT Seminar Series, GE Global Research Center, Niskayuna, NY, September 9, 2014.
- “Multi-Energy CT: Future Directions,” Annual Meeting of the Association of Physicists in Medicine, Austin, TX, July 23, 2014.
- “Estimating dose due to X-ray backscatter security scans,” Department of Homeland Security, Washington DC, May 23, 2013.
- “Estimating the dose to organs from X-ray backscatter scanners: methods, estimates, and open issues,” Algorithm Development for Security Applications meeting (ADSA08), Boston, MA, October 24, 2012.
- “Tools for simulating CT scanners,” Algorithm Development for Security Applications meeting (ADSA07), Boston, MA, May 15, 2012.

PATENTS

- T. G. and K. R. Zimmerman, inventors; Marquette University, assignee; “Material decomposition of multi-spectral x-ray projections using neural networks,” United States Patent US 9,808,216, November 7, 2017
- D. R. Okerlund, S. Dutta, B. E. Nett, D. Pazzani, D. Stassi and T. G. Schmidt, inventors; General Electric Co, assignee; “Systems and methods for coronary imaging,” United States Patent US 9,629,587, April 25, 2017
- N. J. Pelc, T. G. Schmidt, inventors; Stanford University, assignee; “Sampling in Volumetric Computed Tomography,” United States Patent US 7,103,138, September 5, 2006

RESEARCH GRANTS AND CONTRACTS

Funding to date as Principal Investigator (PI) or Project Director: Total (wIDC) \$5,500,949;
Direct Costs (DC): \$4,041,161;

National Institutes of Health

R01 Grant (R01EB023968)

Title: Spectral CT metal artifact correction
MPI: Taly Schmidt and Emil Sidky
DC: \$1,169,949; wIDC: \$1,405,211

Period: 5/1/19-01/31/23

National Institutes of Health

U01 Grant (1U01EB023822-02S1)

Title: Supplement to Software tool for routine, rapid, patient-specific CT organ dose estimation
MPI: Taly Schmidt and Petr Jordan
DC: \$92,940; wIDC: \$92,940

Period: 9/21/2018-3/31/19

National Institutes of Health

U01 Grant (1U01EB023822)

Title: Software tool for routine, rapid, patient-specific CT organ dose estimation
MPI: Taly Schmidt and Petr Jordan
DC: \$1,653,269; wIDC: \$2,482,601

Period: 7/01/17-3/31/21

GE Healthcare

Title: Improved Bolus Tracking for CT Angiography
PI: Taly Schmidt
DC: \$124,103; wIDC: \$187,395

Period: 6/1/17-5/31/20

GE Healthcare

Title: Improvements to the Autophase Algorithm
PI: Taly Schmidt
DC: \$41,513; wIDC: \$51,476

Period: 1/20/15-12/31/15

GE Healthcare

Title: Next Generation CT Image Quality Metrics
PI: Taly Schmidt
DC: \$81,227; wIDC: \$100,721

Period: 12/1/14-6/30/16

National Institutes of Health

R21 Grant (1 R21 EB015094-01A1)

Title: Advancing Energy-Resolved CT Systems for Imaging K-edge Contrast Agents
PI: Taly Schmidt
DC: \$275,000; wIDC: \$394,769

Period: 12/15/12-12/14/14

GE Healthcare

Title: Advanced Cardiac CT Applications
PI: Taly Schmidt
DC: \$59,018; wIDC: \$73,182

Period: 01/01/13-12/31/14

GE Healthcare

Title: Evaluating the Dose and Image Quality Performance of Organ-based Tube Current Modulation

PI: Taly Schmidt

Period: 07/01/12-06/30/14

Direct Costs: \$50,638; wIDC: \$62,792

Department of Homeland Security

Title: Develop Advanced 3D Volumetric Segmentation Algorithms for Image Data of CTScanned Bags at the Airport Security Checkpoint

PI: Xin Feng (EE, Marquette University)

Period: 04/08/12-12/18/12

Direct Costs: \$46,512; wIDC: \$70,000

Role: Co-I

US Department of Education

National Institute on Disability and Rehabilitation Research # H133E100007,

Title: Rehabilitation Engineering Research Center on Technologies for Children with Orthopedic Disabilities

PI: Gerald F. Harris (Marquette University)

Period: 10/1/2010-9/30/2015 DC:

\$4,456,124; wIDC: \$4,750,000

Role: Project Director: "Development Project D3: Biplanar Fluoroscopic System for Dynamic, *in vivo* Foot and Ankle Motion Analysis" DC

(sub-project): \$215,519 wIDC: \$267,484

National Institutes of Health

Area Grant 1R15CA143713-01A1

Title: Innovative Reconstruction Algorithms for Undersampled SPECT

PI: Taly Schmidt

Period: 07/01/10-06/30/13

DC: \$257,985; wIDC: \$361,478

Food and Drug Administration

Office of Women's Health

Title: Radiation Dose and Excess Cancer Risk in Women Undergoing X-Ray Computed Tomography: Quantification and Risk Mitigation

PI: Iacovos Kyprianou (FDA)

Period: 07/01/09-06/30/12

DC: \$98,355 (Marquette subcontract)

Role: Co-I

Alvin W. and Marion Birnschein Foundation

Title: Reducing the Radiation Dose to Women Receiving Cardiac CT Scans

PI: Taly Schmidt

Period: 01/01/10-12/31/10

DC: \$20,000

TEACHING

Courses

Instructor: BIEN 4290 (formerly 194) Biocomputing Design Lab 2
Spring 2006 – 2016, 2018, 2019

Instructor: BIEN 3300 (formerly 155), Signals and Systems for Biomedical Engineering
Spring 2008, 2009, 2011, Fall 2012 – 2015, 2017, 2018

Instructor: BIEN 4500/5500 (formerly 182) Medical Imaging Physics
Fall 2006, 2008, 2011, 2013, Spring 2016

Instructor: BIEN 4510/5510 (formerly 184) Image Processing for Biomedical Sciences
Fall 2009, Spring 2012, Spring 2013, Spring 2015, Fall 2017

Module Instructor: BIEN 1100 – Intro to Biomedical Engineering Methods 1
Fall 2007 - 2018

Senior Design Teams Advised

2018-2019: B2 Liver Phantom Holder for CT Scan
2017-2018: B2 Automated Scanning of Maxillary/Mandibular Arch for 3M Scanner
2017-2018: B12 Phantom to Simulate Flow of Contrast Agent During CT Scans
2014-2015: B1 Improved Design of Head Holder for GE Revolution CT Scanner 2013-
2013-2014: B6 Collision Avoidance System for SPECT Systems.
2011-2012: B23 Image Quality Phantom Development
2009-2010: B30 Pediatric Digital X-ray Sensor
2008-2009: B34 Breast Lesion Detection Evaluation of Nuclear Medicine Cameras
2008-2009: B27 X-ray Tomosynthesis Application for Osteoarthritis
2007-2008: B27 Hexapod Heart Motion Simulator for Siemens Medical Solutions
2006-2007: B20 Phantom for Dynamic Simulation of Organs for Nuclear Medicine
Imaging

DISSERTATION AND THESES COMMITTEES

Undergraduate Research Mentor

Parker Jenkins

Michael Offe

Mohammad Saleh

Wesley Richerson (B.S. in Biomedical Engineering 2017)

Tim Panagis (B.S. in Biomedical Engineering 2012)

Diksha Gandhi (B.S. in Biomedical Engineering 2012)

Robert Cooper (B.S. in Biomedical Engineering 2009)

Masters Thesis Chair and Primary Advisor

Daniel Stassi, M.S. 2014

Automated Selection Of The Optimal Cardiac Phase For Single-Beat Coronary Ct Angiography Reconstruction

Current Position: Siemens Healthineers

Diksha Gandhi, M.S. 2014

The Effects of Organ-Based Tube Current Modulation on Radiation Dose and Image Quality in Computed Tomography Imaging

Current Position: GE Healthcare

Paul Wolf, M.S. 2012

Development and performance of a sparsity-exploiting algorithm for few-view single photon emission computed tomography (SPECT) reconstruction

Current Position: Imaging Scientist at Exelis

Mike Hoppe, M.S. 2012

Reducing the dose to women receiving cardiac CT scans

Current Position: Biomedical Engineer, Veda Data Solutions.

Elizabeth Philips, M.S. 2010

A Non-Rigid Registration method for analyzing myocardial wall motion for cardiac CT images

Current Position: Biomedical Engineer: GE Healthcare

Dan Ma, M.S. 2009

Multi-pinhole Dynamic SPECT Imaging of the Lung: Simulation and System Optimization

Current Position: Research Scientist in Biomedical Engineering at Case Western

Reema Bhagtani, M.S. 2008

Simulated scatter performance of an inverse-geometry dedicated breast CT system

Current Position: Senior R&D Engineer, Baxter Healthcare

Doctoral Dissertation Primary Advisor

Bindu Bhat: 2018 - present

Kevin Zimmerman: 2013-present

Parag Khobragade: PhD 2018

Development and Application of Quantitative Metrics for Computed Tomography Image Quality Assessment

Hongfeng Ma: PhD 2016

Motion Artifact Evaluation of Coronary CT Angiography Images

Curriculum Vitae: Taly Gilat Schmidt, PhD

Janelle Cross: PhD 2015

Biplanar Fluoroscopic Analysis of in vivo Hindfoot Kinematics During Ambulation

Franco Rupcich, PhD 2013

Reducing Radiation Dose to the Female Breast During Conventional and Dedicated Computed Tomography

Postdoctoral Fellow Advisor

Hongfeng Ma: 2018 - present

Sara Principi: 2018 - present

UNIVERSITY SERVICE

University / College Service

Member, Search Committee for Vice President of Corporate Engagement, 2018

Member, University Task Force on Corporate Engagement, 2018

Member, MU High Performance Computing Governance Committee, 2012-2016

Member, College of Engineering Dean Search Committee, 2015

Member, College of Engineering Technology Committee, 2011-2012

Member, College of Engineering Computer Systems Engineer Search Committee, 2007, 2008

Departmental Service

Member, Founding Chair Search Committee, Department of Biomedical Engineering, 2016-2017

Graduate Program Assessment Leader, Department of Biomedical Engineering, 2008present.

Chair, Faculty Search Committee, Department of Biomedical Engineering, 2015

Member, Graduate Program Committee, Department of Biomedical Engineering, 2006present

Member, Department Chair Search Committee, Department of Biomedical Engineering, 2012-2013

Member, Faculty Search Committee, Department of Biomedical Engineering, 2006

MEDIA COVERAGE

KEEN'zine, "Debate: A contrarian approach to entrepreneurial minded learning," September 2017 (<http://engineeringunleashed.com/keen/keenzine/>)

CNN.com, "Airport body scanners: Are they safe?" Mike Ahlers, June 11, 2012.

WUWM Lake Effect Program Interview, "Full Body Scanner Safety - A New Study Calls for More Study," June 19, 2012

Chicago Tribune, "Lingering doubt on scanners," Josh Noel, July 17, 2012.

Dr. Radio, Sirius XM 81, Live Interview on Airport Backscatter Systems, July 18, 2012.