Wookjin Choi, Ph.D.

Assistant Professor
Department of Radiation Oncology
Sidney Kimmel Medical College at Thomas Jefferson University
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http://qradiomics.com/

Research Area

Machine Learning/Deep Learning
Medical Image Analysis
Radiomics/Computer Aided Diagnosis

Academic Appointments

Sidney Kimmel Medical College
at Thomas Jefferson University, Dept. of Radiation Oncology — Philadelphia, PA
Assistant Professor — 1/2022 – Present
- Computational Medical Physics
- Interpretable Radiomics and Deep Learning in Medicine

Virginia State University (VSU), Dept. of Computer Science — Petersburg, VA
Assistant Professor — 9/2019 – 12/2021
- A Robust Human Action Recognition System
- Big Data Analytics and Deep Learning

University of Virginia (UVA) School of Medicine, Dept. of Radiation Oncology — Charlottesville, VA
Visiting Assistant Professor — 11/2019 – Present
Research Associate with Dr. Jeffrey Siebers — 12/2018 – 9/2019
- Comprehensive analysis and mitigation of the clinical effects of delineation and geometric uncertainties in conformal radiation therapy

Memorial Sloan Kettering Cancer Center (MSKCC), Dept. of Medical Physics — New York, NY
University of Maryland School of Medicine (UMB), Dept. of Radiation Oncology — Baltimore, MD
Post-Doctoral Fellow (UMB) and Research Scholar (MSKCC) with Dr. Wei Lu — 7/2014 – 12/2018
- Quantitative PET/CT Analysis to Improve Evaluation of Tumor Response
- 4D-CT Simulation Using Dynamic Contrast Enhancement

GIST, School of Mechatronics — Buk-gu**,** Gwangju, Korea
Research Fellow with Dr. Tae-Sun Choi — 8/2013 – 7/2014
- 3D Image Analysis for Computer Aided Diagnosis in Lung CT Image
- A System for Computer Aided Detection of Pulmonary Disease

Research Assistant with Dr. Tae-Sun Choi — 8/2006 – 8/2013
- Automatic Detection of Pulmonary Lesions using Digital Bio Image Processing
- 3D shape reconstruction from auto focused images
- Multi-modal (EO/IR) image registration algorithm (KOMSAT-3A, KARI)

Education

Gwangju Institute of Science and Technology (GIST) Buk-gu, Gwangju, Korea
PhD in Mechatronics 3/2008 – 8/2013
Dissertation: Automatic detection of pulmonary nodules in lung CT images (Advisor: Tae-Sun Choi)
MS in Information and Mechatronics 9/2006 – 2/2008
Thesis: Three-dimensional shape recovery for measuring LCD color filter (Advisor: Tae-Sun Choi)

Korea University of Technology and Education (KoreaTech) Cheonan-si, Chungcheongnam-do, Korea
BS in Computer Science and Engineering 3/2002 – 8/2006
Graduation Project: Multi-platform keystroke identification system (Advisor: Tai-Hoon Cho)
Completion of the teacher training for career and technical education (Software Development)

Research Grants and Contracts

SKCC Research Grant 1/2022 – 1/2024
PI: Wookjin Choi
"Interpretable Predictive Models for Radiation Therapy"
Sidney Kimmel Cancer Center at Thomas Jefferson University Hospital
Total Direct Costs: $140,000

N00174-21-1-0011 5/2021 – 5/2024
co-PI: Wookjin Choi
"Deep Learning-based Target Tracking and Assignment for Cooperative Swamp Defense"
DoD Naval Engineering Education Consortium (NEEC)
Total Direct Costs: $261,796

W911NF2110280 5/2021 – 5/2022
PI: Wookjin Choi
"Acquisition of a GPU- Accelerated Deep-Learning Research Cluster"
DoD Research and Education Program for HBCU/MI Equipment/Instrumentation
Total Direct Costs: $588,244

CCI Grant 5/2021 – 8/2022
co-PI: Wookjin Choi
"Cybersecurity Monitoring and Assurance Training Program for Safe and Secure Port Operations"
Commonwealth Cyber Initiative Grant – Scalable Pilot Programs for Experiential Learning in CCI
Total Direct Costs: $150,000 (VSU: $32,070)

CCAM E-055 7/2020 – 7/2021
PI: Wookjin Choi
"A Robust Human Action Recognition System using Multi-View Depth Videos for Safe and Reliable Human-Robot Interactions in a Mixed Reality Environment"

Innovation Fund, VSU & Commonwealth Center for Advanced Manufacturing
Total Direct Costs: $50,000

NRF-2013R1A1-A2058113 11/2013 – 7/2014
PI: Wookjin Choi
"3D Image Analysis for Computer Aided Diagnosis in Lung CT Image"
Basic Science Research Program, National Research Foundation of Korea (Similar to K99/R00)
Total Direct Costs: $39,000

2013RS-03-00000-P-00173 12/2013 – 12/2014
PI: Wookjin Choi, founded QuaLIA, Inc.
"A System for Computer Aided Detection of Pulmonary Disease"
Start-up Seed Grant, Small and Medium Business Administration of Korea (Similar to SBIR)
Total Direct Costs: $90,000

Teaching/Mentoring

1. Lectures and Projects
   - CSCI 150/151 Programming I & Lab (Fall 2020)
   - CSCI 281 Discrete Structures (Spring 2020, Spring 2021)
   - CSCI 287 Data Structures (Fall 2019, Fall 2020)
   - CSCI 392 Algorithms and Adv. Data Structures (Fall 2019, Spring 2021)
   - CSCI 445 Computer Communications Network (Fall 2020)
   - CSCI 471 Parallel and Distributed Programming (Fall 2021)
   - CSCI 493 Senior Project I (Spring 2020, Spring 2021)
   - CSCI 494 Senior Project II (Fall 2019, Fall 2020)
   - CSCI 545 Advanced Data Communications (Fall 2020)
   - CSCI 592 Adv. Algorithms (Spring 2020, Spring 2021)
   - CSCI 643 Spe. Top.: Intro. to Machine Learning (Spring 2021)
   - CSCI 640 Spe. Top.: Intro. to Deep Learning (Fall 2021)
2. Mentoring Graduate Students
   - Mariele J. Ponticiello (July 2021), Thesis Committee, The Effects of the Sudden Switch to Remote Learning Due to Covid-19 on HBCU Students and Faculty
   - Courtney A. Lawson (December 2020), Thesis Committee, Combined Intelligent Facial Segmentation with Machine Learning Algorithms & Neural Network Techniques for Facial Recognition
   - Mariah C. Simmons (November 2020), Thesis Committee, Catfishing: An Investigation into Social Media and Online Impersonation
   - Jordanne Davenport (July 2020), Thesis Committee, All the feels: Emotional Impact of Students when Viewing Social Media Posts
   - Ji-Seok Yoon (Spring 2014), Pulmonary Nodule Segmentation using 3D Deformable Mesh Model Adaptation
   - Maliazurina Saad (Spring 2014), False Positive Reduction using Genetic Algorithm Based Feature Selection and Support Vector Machine Classification
3. Mentoring Summer Interns
   - Denise Daniels, Luis E Jorge (Summer 2020)
4. Teaching Assistant
   Digital Signal Processing (Spring 2013), Robot Vision (Fall 2012)
5. Teaching Certifications

- Vocational Teacher Certification (Software Development, 3rd class) from Korean Ministry of Employment and Labor
- Online Teaching Certification (TOL, DYOC, QM Rubrics) from QM Quality Matters
- IBM Artificial Intelligence Practitioner - Instructor

Publications

Journal Articles

1. Jung Hun Oh, **Wookjin Choi**, Euiseong Ko, Mingon Kang, Allen Tannenbaum, Joseph O Deasy, "PathCNN: interpretable convolutional neural networks for survival prediction and pathway analysis applied to glioblastoma", Bioinformatics, Volume 37, Issue Supplement_1, July 2021, Pages i443–i450, the first two authors should be regarded as Joint First Authors.
2. **Wookjin Choi**, Saad Nadeem, Sadegh Riyahi, Joseph O. Deasy, Allen Tannenbaum, Wei Lu, "Reproducible and Interpretable Spiculation Quantification for Lung Cancer Screening", Computer Methods and Programs in Biomedicine, Volume 200, March 2021, 105839. https://doi.org/10.1016/j.cmpb.2020.105839
3. Victor Gabriel Leandro Alves, Eric Aliotta, **Wookjin Choi**, Mahmoud Ahmed, Jeffrey V. Siebers, "An error detection method for real-time EPID-based treatment delivery quality assurance," Medical Physics, Available online 12 December 2020. doi: 10.1002/mp.14633
4. Eric Aliotta, Hamidreza Nourzadeh, **Wookjin Choi**, Victor Gabriel Leandro Alves, Jeffrey V Siebers, "An automated workflow to improve efficiency in radiation therapy treatment planning by prioritizing organs-at-risk", Advances in Radiation Oncology, 5(6), November 2020, pp. 1324-1333. doi:10.1016/j.adro.2020.06.012
5. Noemi Garau, Chiara Paganelli, Paul Summers, **Wookjin Choi**, Sadegh Alam, Wei Lu, Cristiana Fanciullo, Massimo Bellomi, Guido Baroni, Cristiano Rampinelli, "External validation of radiomics-based predictive models in low-dose CT screening for early lung cancer diagnosis", Medical Physics, First published:02 June 2020. doi:10.1002/mp.14308
6. Jiahui Wang, Hao Zhang, Michael Chuong, Kujtim Latifi, Shan Tan, **Wookjin Choi**, Sarah Hoffe, Ravi Shridhar and Wei Lu, "Prediction of Anal Cancer Recurrence after Chemoradiotherapy Using Quantitative Image Features Extracted from Serial 18F-FDG PET/CT", Frontiers in Oncology, 2019, 9: 934.
7. Jingjing Zhang, Svetlana Markova, Alejandro Garcia, Kirk Huang, Xingyu Nie, **Wookjin Choi**, Wei Lu, Abraham Wu, Andreas Rimner, "Potential clinical utility of automatic contour propagation in T2-weighted navigator-triggered 4DMRI for internal organ-at-risk volume (IOV) evaluation", Journal of Applied Clinical Medical Physics, doi:10.1002/acm2.12431, August 2018. doi:10.1002/acm2.12431
8. **Wookjin Choi**, Sadegh Riyahi, Seth J. Kligerman, Chia-Ju Liu, James G. Mechalakos, Wei Lu, "Technical Note: Identification of Normal Lung CT Texture Features Robust to Tumor Size for the Prediction of Radiation-Induced Lung Disease", International Journal of Medical Physics, Clinical Engineering and Radiation Oncology, Vol.7 No.3, Paper ID 86485, pp. 330-338, August 2018. doi:10.4236/ijmpcero.2018.73027
9. Sadegh Riyahi , **Wookjin Choi** , Chia-Ju Liu , Hualiang Zhong , Abraham J. Wu , James G. Mechalakos , Wei Lu, "Quantifying local tumor morphological changes with Jacobian map for prediction of pathologic tumor response to chemo-raiotherapy in locally advanced esophageal cancer", Physics in Medicine & Biology, Vol. 63, 145020 (13pp), July 2018. doi:10.1088/1361-6560/aacd22
10. **Wookjin Choi**, Jung Hun Oh, Sadegh Riyahi, Feng Jiang, Wengen Chen, Charles White , Andreas Rimner , James G. Mechalakos , Joseph O. Deasy , Wei Lu, "Radiomics analysis of pulmonary nodules in low-dose CT for early detection of lung cancer" , Medical Physics, Vol. 45, No. 4, pp. 1537-1549, April 2018. doi:10.1002/mp.12820 [**Selected as an Editor's Pick**]

11. Shan Tan, Laquan Li, **Wookjin Choi**, Min Kyu Kang, Warren D'Souza, Wei Lu, "Adaptive region-growing with maximum curvature strategy for tumor segmentation in ^{18}F-FDG PET", Physics in Medicine and Biology, Vol. 62, No. 13, pp. 5383-5402, June 2017. doi:10.1088/1361-6560/aa6e20
12. **Wookjin Choi**, M Xue, B Lane, M Kang, K Patel, W Regine, P Klahr, J Wang, S Chen, W D'Souza, W Lu, "Individually Optimized Contrast-Enhanced 4D-CT for Radiotherapy Simulation in Pancreatic Ductal Adenocarcinoma", Medical Physics, Vol. 43, No. 10, pp. 5659-5666, October 2016. doi:10.1118/1.4963213
13. M. Arfan Jaffar, **Wookjin Choi**, Tae-Sun Choi, "Classification of Lungs Nodules using Hybrid Features and Neural Network", Information, Vol. 17, No. 5, pp. 1771-1776, May 2014
14. **Wookjin Choi**, Tae-Sun Choi, "Automated Pulmonary Nodule Detection based on Three-dimensional Shape-based Feature Descriptor", Computer Methods and Programs in Biomedicine, Vol. 113, No. 1, pp. 37–54, January 2014. doi:j.cmpb.2013.08.015
15. **Wookjin Choi**, Tae-Sun Choi, "Log-polar Sampling based Voxel Classification for Pulmonary Nodule Detection in Lung CT scans", Journal of Korean Institute of Information, Electronics and Communication Technology, Vol. 6, No. 1, pp. 37-44, April 2013.
16. **Wookjin Choi**, Tae-Sun Choi, "Automated Pulmonary Nodule Detection System in Computed Tomography Images: A Hierarchical Block Classification Approach", Entropy, Vol. 15, No. 2, pp. 507-523, February 2013. doi:10.3390/e15020507
17. **Wookjin Choi**, Tae-Sun Choi, "Pulmonary Nodule Detection based on Hierarchical 3D Block Analysis in Chest CT scans", Journal of Korean Institute of Information, Electronics and Communication Technology, Vol. 5, No. 1, pp.13-19, April 2012.
18. **Wookjin Choi**, Tae-Sun Choi, "Genetic Programming-based feature transform and classification for the automatic detection of pulmonary nodules on computed tomography images", Information Sciences, Vol. 212, pp. 57-78, December 2012. doi:10.1016/j.ins.2012.05.008
19. **Wookjin Choi**, Mannan Saeed Muhammad, Tae-Sun Choi, "3D Shape Recovery Algorithm with Reduction of 3D Spatial Complexity", Journal of Korean Institute of Information Technology, Vol. 6, No. 4, pp.108-114, August 2008.
20. M.T. Mahmood, **Wookjin Choi**, Tae-Sun Choi, "PCA-Based Method for 3-D Shape Recovery of Microscopic Objects from Image Focus Using Discrete Cosine Transform", Microscopy Research and Technique, Vol. 71, No. 12, pp. 897-907, December 2008. doi:10.1002/jemt.20635

Conference Papers

21. Sanghoon Lee, Colton Farley, Simon Shim, Yanjun Zhao, **Wookjin Choi**, Wook-Sung Yoo, "Unsupervised Learning of Deep-Learned Features from Breast Cancer Images," 2020 IEEE 20th International Conference on Bioinformatics and Bioengineering (BIBE), Cincinnati, OH, 2020, pp. 740-745, doi: 10.1109/BIBE50027.2020.00126.
22. Darrin Gladman, Jehu Osegbe, **Wookjin Choi***, and Joon Suk Lee "Automatic motion tracking system for analysis of insect behavior", Proc. SPIE 11510, Applications of Digital Image Processing XLIII, 115102W (21 August 2020); https://doi.org/10.1117/12.2568804 (*corresponding author)
23. **Wookjin Choi**, Saad Nadeem, Sadegh Riyahi, Joseph O. Deasy, Allen Tannenbaum, Wei Lu, "Interpretable Spiculation Quantification for Lung Cancer Screening", Shape in Medical Imaging: International Workshop, ShapeMI 2018, Held in Conjunction with MICCAI 2018, Granada, Spain, September 20, 2018, Lecture Notes in Computer Science, Vol. 11167, pp. 38-48, 2018. arXiv:1808.08307 [cs.CV]
24. Sadegh Riyahi, **Wookjin Choi**, Chia-Ju Liu, Saad Nadeem, Shan Tan, Hualiang Zhong, Wengen Chen, Abraham Wu, James Mechalakos, Joseph Deasy, Wei Lu, "Quantification of Local Metabolic Tumor Volume Changes by Registering Blended PET-CT Images for Prediction of Pathologic Tumor Response", Data Driven Treatment Response Assessment and Preterm, Perinatal, and Paediatric Image Analysis. PIPPI 2018, DATRA 2018, Held in Conjunction with MICCAI 2018, Granada, Spain, September 20, 2018, Lecture Notes in Computer Science, Vol. 11076, pp. 31-41, 2018. arXiv:1808.08312 [cs.CV]

25. **Wookjin Choi**, Tae-Sun Choi, “Pulmonary Nodule Detection using Insight Toolkit in Lung CT Images”, Korean Institute of Information Technology (KIIT) Conference 2014, Cheonan, Korea, pp. 9-13, May 2014.
26. **Wookjin Choi**, Tae-Sun Choi, “Statistical Shape Model based Three Dimensional Shape Modeling for Knee Joint on Magnetic Resonance Images”, KIIT Conference 2012, Seoul, Korea, pp. 461-465, November 2012.
27. **Wookjin Choi**, Tae-Sun Choi, “Pulmonary Nodule Detection using Voxel Classification in Lung CT scans”, Korean Institute of Information, Electronics and Communication Technology (KIIECT) Conference 2012, Jeonju, Korea, pp. 152-155, May 2012.
28. **Wookjin Choi**, Tae-Sun Choi, “Pulmonary Structures Segmentation and Nodule Detection using 3D Block Analysis of Chest CT scans”, KIIECT Conference 2011, Gwangju, Korea, pp. 197-200, October 2011.
29. **Wookjin Choi**, Tae-Sun Choi, “Pulmonary Nodule Candidate Detection using Modified Circular Hough Transform”, KIIT Conference 2011, Chungju, Korea, pp. 8-11, May 2011.
30. M. T. Mahmood, Ik-Hyun Lee, **Wookjin Choi**, Tae-Sun Choi, “A Nonlinear Approach for Depth From Focus for Digital Cameras”, IEEE International Conference on Consumer Electronics (ICCE) 2011, Las Vegas, NV, pp. 187-188, January 2011.
31. **Wookjin Choi**, Tae-Sun Choi,” Pulmonary Nodule Detection using Genetic Programming”, KIIECT Conference 2010, Gangneung, Korea, pp.100-103, Vol.3, No.2, October 2010.
32. **Wookjin Choi**, Tae-Sun Choi, “Computer-aided detection of pulmonary nodules using genetic programming”, IEEE International Conference on Image Processing (ICIP) 2010, Hong Kong, pp. 4353-4356, September 2010. (**Acceptance rate 45.7%**)
33. **Wookjin Choi**, Ik-Hyun Lee, Tae-Sun Choi, “Adaptive Lung Region Segmentation using Graph-cuts”, KIIT Conference 2010, Suwon, Korea, pp. 7-10, May 2010.
34. **Wookjin Choi**, Tae-Sun Choi, “False Positive Reduction in Pulmonary Nodule Detection using Principal Component Analysis”, KIIT Conference 2009, Mokpo, Korea, pp. 202-207, June 2009.
35. **Wookjin Choi**, Tae-Sun Choi, “Computerized Detection of Pulmonary Nodule based on Two-Dimensional PCA”, International Conference on Computational Science and Its Applications (ICCSA) 2009, Suwon, Korea, Lecture Notes in Computer Science (LNCS), Vol. 5593, pp. 693-702, June 2009. [**ORAL**]
36. **Wookjin Choi**, A. Majid, Tae-Sun Choi, “False positive reduction for pulmonary nodule detection using two-dimensional principal component analysis”, Proc. SPIE 7443, Applications of Digital Image Processing XXXII, San Diego, CA, 744322, September 2009.
37. M.T. Mahmood, **Wookjin Choi**, Tae-Sun Choi, “DCT and PCA based method for shape from focus”, ICCSA 2008, Perugia, Italy, LNCS, Vol. 5073, pp. 1025-1103, July 2008. [**ORAL**]
38. **Wookjin Choi**, Tae-Sun Choi, “Fast three-dimensional shape recovery in TFT-LCD manufacturing”, Proc. SPIE 7073, Applications of Digital Image Processing XXXI, 70731U, San Diego, CA, September 2008
39. **Wookjin Choi**, Mannan Saeed Muhammad, Minji Lee, Tae-Sun Choi, “Depth Measurement Using Pixel Intensities”, Institute of Electronics Engineers of Korea (IEEK) Conference 2008, Pyeongchang, Korea, pp. 901-902, June 2008.

Conference Abstracts

40. **Wookjin Choi**, V Leandro Alves, E Aliotta, H Nourzadeh, J Siebers, “Assessing the Dosimetric Links Between Organ-At-Risk Delineation Variability and Treatment Planning Variability”, Joint AAPM | COMP Meeting, July 12-16, 2020 [**ePoster**]
41. W Lu, N Yamada, L Hong, **Wookjin Choi**, X Tang, J Mechalakos, S Berry, P Romesser, O Cahlon, S Powell, G Li, “Comparison of Surface Imaging and 2DkV Imaging Vs. CBCT in Left Breast DIBH Radiotherapy”, Joint AAPM | COMP Meeting, July 12-16, 2020 [**ePoster**]

42. M H Soomrom, H Nourzadeh, V Leandro Alves, **Wookjin Choi**, J Siebers, "Dosimetric Analysis of OARnet Auto-Delineations for Head and Neck Organs-At-Risk", Joint AAPM | COMP Meeting, July 12-16, 2020 [**ePoster**]
43. M H Soomro, H Nourzadeh, V Leandro Alves, **Wookjin Choi**, J Siebers, "OARnet: Organs-At-Risk Delineation in Head and Neck CT Images", Joint AAPM | COMP Meeting, July 12-16, 2020
44. M Thor, KJ Fitzgerald, A Apte, JH Oh, A Iyer, S Nadeem, **Wookjin Choi**, ED Yorke, J Chaft, AJ Wu, M Offin, D Gelblum, JO Deasy, A Rimner, "A Pre-Treatment PET And CT-Derived Model for Progression-Free Survival in Early Stage Non-Small Cell Lung Cancer", Annual Meeting of the American Society for Radiation Oncology (ASTRO), Oct 25-28, 2020
45. **Wookjin Choi**, E Aliotta, H Nourzadeh, J Siebers, "Simulation of Realistic Organ-At-Risk Delineation Variability in Head and Neck Radiation Therapy", MEDICAL PHYSICS 46 (6), E186-E187, AAPM Annual Meeting, San Antonio, TX, USA, July 14, 2019 [**SNAP ORAL**]
46. H Nourzadeh, M Ahmed, **Wookjin Choi**, E Aliotta, W Watkins, J Siebers, "Radiation Therapy Robustness Analyzer (RTRA): A GPU Accelerated Software to Simulate the Effect of Uncertainties in External Beam Radiation Therapy", MEDICAL PHYSICS 46 (6), E415-E415, AAPM Annual Meeting, San Antonio, TX, USA, July 14, 2019 [**ORAL**]
47. S Riyahi, **Wookjin Choi**, C Liu, S Nadeem, S Tan, H Zhong, W Chen, A Wu, J Mechalakos, J Deasy, W Lu, "Quantification of Local Metabolic Tumor Volume Changes by Registering Blended 18F-FDG PET/CT Images for Prediction of Pathologic Tumor Response", MEDICAL PHYSICS 46 (6), E463-E463, AAPM Annual Meeting, San Antonio, TX, USA, July 14 ,2019 [**ORAL**]
48. **Wookjin Choi**, Sadegh Riyahi, Chia-Ju Liu, Wei Lu, "Robust Normal Lung CT Texture Features for the Prediction of Radiation-Induced Lung Disease", ASTRO Annual Meeting, San Diego, CA, USA, September 25, 2017. [**ePoster**]
49. Sadegh Riyahi, **Wookjin Choi**, Chia-Ju Liu, Wei Lu, "Prediction of pathologic tumor response to chemoradiotherapy in locally advanced esophageal cancer using Jacobian map", ASTRO Annual Meeting, San Diego, CA, USA, September 25, 2017.
50. Guang Li, Svetlana Markoa, Alejandro Garcia, Jason Moody, Jingjing Zhang, Andreas Rimner, Abraham Wu, Christopher Crane, **Wookjin Choi**, Wei Lu, Neelam Tyagi, Kristen Zakian, Mo Kadbi, James Mechalakos, Joseph Deasy, "Clinical evaluation of automatic organ contour propagation using 4DMRI images", ASTRO Annual Meeting, San Diego, CA, USA, September 25, 2017.
51. **Wookjin Choi**, J Oh, S Riyahi Alam, F Jiang, W Chen, J Deasy, W Lu, "Radiomics Analysis of Pulmonary Nodules in Low Dose CT for Early Detection of Lung Cancer", AAPM Annual Meeting, Denver, CO, USA, July 30, 2017. [**ORAL**]
52. **Wookjin Choi**, C Liu, S Riyahi Alam, J Oh, P Adusumilli, W Weber, J Deasy, W Lu, "Aggressive Lung Adenocarcinoma Subtype Prediction Using FDG-PET/CT Radiomics", AAPM Annual Meeting, Denver, CO, USA, July 30, 2017. [**SNAP ORAL**]
53. S Riyahi Alam, **Wookjin Choi**, C Liu, W Lu, "Quantifying Tumor Morphological Change with Jacobian Map for Prediction of Pathologic Tumor Response to Chemo-Radiotherapy in Locally Advanced Esophageal Cancer", AAPM Annual Meeting, Denver, CO, USA, July 30, 2017. [**ePoster**]
54. H Zhang, S Riyahi Alam, **Wookjin Choi**, D Ayala-Peacock, E McTyre, J Bourland, A Blackstock, W D'Souza, W Lu, "First Experience on Validation of Pathologic Response Prediction Models Utilizing PET/CT Radiomic Features Using Multi-Institutional Datasets", AAPM Annual Meeting, Denver, CO, USA, July 30, 2017. [**ePoster**]
55. **Wookjin Choi**, M Xue, B Lane, M Kang, K Patel, W Regine, P Klahr, J Wang, S Chen, W D'Souza, W Lu, "Individually optimized contrast-enhanced 4D-CT for radiotherapy simulation in pancreatic adenocarcinoma", ASTRO Annual Meeting 2016, Boston, MA, USA, September 25, 2016. [Selected for the ARRO poster walk, 6 out of 250 physics posters]
56. **Wookjin Choi**, M Xue, B Lane, M Kang, K Patel, W Regine, P Klahr, J Wang, S Chen, W D'Souza, W Lu, "Individually Optimized Contrast-Enhanced 4D-CT for Radiotherapy Simulation in Pancreatic Ductal Adenocarcinoma", AAPM Annual Meeting 2016, Washington, DC, USA, July 12, 2016. [**ORAL**]

57. **Wookjin Choi**, S Riyahi, W Lu, "Identification of Robust Normal Lung CT Texture Features for the Prediction of Radiation-Induced Lung Disease", AAPM Annual Meeting 2016, Washington, DC, USA, July 12, 2016.
58. S Riyahi, **Wookjin Choi**, N Bhooshan, S Tan, H Zhang, W Lu, "Comparison of Registration Methods for Modeling Pathologic Response of Esophageal Cancer to Chemoradiation Therapy", AAPM Annual Meeting 2016, Washington, DC, USA, July 12, 2016. [**SNAP ORAL**]
59. S Riyahi, **Wookjin Choi**, W Lu, "Novel Radiomics Quantifying Tumor Structural Evolution Using Deformation Vector Field: Application for Tumor Response Assessment", AAPM Annual Meeting 2016, Washington, DC, USA, July 12, 2016.
60. **Wookjin Choi**, M Xue, B Lane, M Kang, K Patel, W Regine, P Klahr, J Wang, S Chen, W D'Souza, W Lu,"Individually optimized contrast-enhanced 4D-CT for radiotherapy simulation in pancreatic cancer", ICCR 2016, London, UK, June 29, 2016. [**ORAL**]
61. MD Chuong, HH Zhang, J Wang, K Latifi, N Saeed, S Tan, **Wookjin Choi**, SE Hoffe, R Shridhar, W Lu, "Analytics for Progression Free Survival and Distant Metastasis Prediction of Anal Cancer Patients After Chemoradiation Therapy Using Spatial Temporal FDG-PET/CT Features", ASTRO Annual Meeting 2015, San Antonio, TX, USA, October 18, 2015
62. **Wookjin Choi**, Ming Xue, Min Kyu Kang, Kruti Patel, William Regine, Paul Klahr, Jiahui Wang, Warren D'Souza, Wei Lu, "Image Quality Assessment of Contrast-Enhanced 4D-CT for Pancreatic Adenocarcinoma in Radiotherapy Simulation", AAPM Annual Meeting 2015, Anaheim, CA, USA, July 12, 2015.
63. **Wookjin Choi**, Min Kyu Kang, Jiahui Wang, Wei Lu, "Quantitative Image Feature Analysis of Multiphase Liver CT for Hepatocellular Carcinoma (HCC) in Radiation Therapy", AAPM Annual Meeting 2015, Anaheim, CA, USA, July 12, 2015.
64. Jiahui Wang, Michael Chuong, Kujtim Latifi, Nadia Saeed, Shan Tan, **Wookjin Choi**, Sarah Hoffe, Ravi Shridhar, Eduardo Moros, Wei Lu, "Repeated 18F-FDG PET/CTs Based Feature Analysis for the Prediction of Anal Cancer Recurrence", AAPM Annual Meeting 2015, Anaheim, CA, USA, July 12, 2015. [**SNAP ORAL**]
65. Hao Zhang, Jiahui Wang, Michael Chuong, Warren D'Souza, Kujtim Latifi, Nadia Saeed, Shan Tan, **Wookjin Choi**, Sarah Hoffe, Ravi Shridhar, Eduardo Moros, Wei Lu, "Evaluating the Role of Mid-Treatment and Post-Treatment FDG-PET/CT in Predicting Progression-Free Survival and Distant Metastasis", AAPM Annual Meeting 2015, Anaheim, CA, USA, July 12, 2015.
66. Hao H. Zhang, Jiahui Wang, Michael Chuong, Kujtim Latifi, Shan Tan, **Wookjin Choi**, Sarah Hoffe, Ravi Shridhar, and Wei Lu, "Analytics in predicting progression-free survival and distant metastasis after chemoradiotherapy using spatial-temporal FDG-PET/CT features", Society of Nuclear Medicine and Molecular Imaging (SNMMI) Annual Meeting 2015, Baltimore, MD, USA, June 8, 2015.
67. M. Arfan Jaffar, **Wookjin Choi**, Tae-Sun Choi, "Classification of pulmonary Nodule from Low Dose CT Scan Images using Neural Networks", Advanced Signal Processing 2012, Seoul, Korea, March 2012.
68. **Wookjin Choi**, Mannan Saeed Muhammad, Tae-Sun Choi, "3D Space Complexity Reducing Method for 3D Camera", KIIT Conference 2008, Busan, Korea, May 2008.
69. **Wookjin Choi**, Tae-Sun Choi, "Three-dimensional Shape Recovery for Measuring the Protrusion on Color Filter", KIIT Conference 2008, Busan, Korea, May 2008.
70. **Wookjin Choi**, Tae-Sun Choi, "Three-dimensional Shape Recovery for Measuring LCD Color Filter", Workshop on Image Processing and Image Understanding 2008, Jeju, Korea, January 2008.
71. **Wookjin Choi**, Seongeun Eom, Heegon Moon, Tae-Sun Choi, "Daphnia Tracking Algorithm for Monitoring Water Quality", Korea Signal Processing Conference, Daegu, Korea, October 2007.

Technical Report

72. Jongho Kim, **Wookjin Choi**, "Radiomics: Novel Paradigm of Deep Learning for Clinical Decision Support toward Plan B using Liquid Biopsy", Korean Association for Radiation Application Issue Paper, Vol. 04, November 2014. (in both English and Korean)

Patents

1. Provisional Patent Filed, "An Image-Based Predictive Model for Recurrence in Early Stage Non-Small Cell Lung Cancer", Saad Nadeem, Maria Thor, Wookjin Choi, and Joseph O. Deasy.
2. US 9,456,798 B2, "Methods and Systems for Individually Optimizing Uniform Contrast Enhancement in Computed Tomography Imaging", Ming Xue, Wei Lu, Hao Zhang, Seth Kligerman, Warren D'Souza, **Wookjin Choi**, Filed May 12, 2015, Issued Oct 4, 2016
3. US 9,349,074 B2, "Method and apparatus for generating 3-D knee joint image", Tae-Sun Choi, **Wookjin Choi**, Filed December 27, 2013, Disclosed April 30, 2015, Issued May 24, 2016
4. Korea 10-1594994, "Method and apparatus for generating 3-D knee joint image", Tae-Sun Choi, **Wookjin Choi**, Issued February 11, 2016
5. Korea 10-1085949, "Apparatus for classifying a lung and a method thereof, capable of automatically determining the state of a lung", Tae-Sun Choi, **Wookjin Choi**, Issued November 16, 2011
6. Korea 10-1066468, "Method and device for discriminating a honeycombed lung from a normal lung and a computer readable recording medium", Tae-Sun Choi, **Wookjin Choi**, Aamir Saeed Malik, Issued September 15, 2011

Invited Talk

1. Artificial Intelligence in Radiation Oncology, KSEA CVA Seminar, Charlottesville, VA, USA, Jan 2020 (host: Dr. B. Brian Park)
2. Quantitative Cancer Image Analysis, Memorial Sloan Kettering Cancer Center, New York, NY, USA, Nov 2019 (host: Dr. Joseph O. Deasy)
3. Quantitative Image Analysis for Cancer Diagnosis and Radiation Therapy, University of Virginia School of Medicine, Charlottesville, VA, USA, Sep 2018 (host: Prof. Jeffrey Siebers)
4. Quantitative Image Analysis for Cancer Diagnosis and Radiation Therapy, Vanderbilt University Medical Center, Nashville, TN, USA, May 2018 (host: Prof. Michael Price)
5. How to Effectively Operate Machine Learning Coursework for All Undergraduate Engineering Students, Korea Tech, Cheonan, Korea, Jan 2018 (host: Prof. Oh-Young Kwon)
6. Radiomics and deep learning for lung cancer screening, KOCSEA Technical symposium, NV, USA, Nov 2017 (host: Prof. Tae Hyun Hwang, Cleveland Clinic)
7. Image processing in lung cancer screening and radiation therapy, GIST, Gwangju, Korea, Nov 2014 (host: Prof. Tae-Sun Choi)
8. Image analysis and nodule detection system in 3D lung CT images using insight toolkit, Cheonnam National University Hospital (CNUH), Gwangju, Korea, Apr 2014 (host: Prof. Yun-Hyeon Kim)
9. Computer aided detection system using machine learning in thoracic CT images, Chosun University, Gwangju, Korea, Dec 2014 (host: Prof. Jong-An Park)
10. Automatic detection of pulmonary nodules in lung CT images, CNUH, Gwangju, Korea, Jul 2013 (host: Prof. Yun-Hyeon Kim)
11. Knee 3-D model generation for total knee arthroplasty, CNUH-GIST Cooperative Research Center, Gwangju, Korea, Jun 2012 (host: Prof. Jongkeun Seon)

Service Activities

1. Technical Program Committee, International Workshop on Deep Learning in Bioinformatics, Biomedicine, and Healthcare Informatics (DLB2H) 2017, 2018, 2019, 2020
2. Judge, Metro Richmond STEM Fair in Senior Division Computer Science, 2020
3. Chapter President of Korean American Scientists and Engineers Association (KSEA) Central Virginia Chapter and Councilor of KSEA, 2021-2022
4. Journal reviews: Medical Physics, International Journal of Radiation Oncology Biology Physics, Practical Radiation Oncology, Computer Methods and Programs in Biomedicine, Computers in Biology and Medicine, International Journal of Computer Assisted Radiology and Surgery, IET Computer Vision, IET Image Processing, BioMedical Engineering Online, Neural Computing and Applications, Diagnostics, Sensors, Symmetry

Professional Society Membership

2010 – Present	Member, Institute of Electrical and Electronics Engineers (IEEE),
2015 – Present	Member, Korean American Scientists and Engineers Association (KSEA)
2014 – Present	Professional Affiliate, American Association of Physicists in Medicine (AAPM)
2016 – 2019	Member-in-Training, American Society for Radiation Oncology (ASTRO)
2010 – 2015	Member, Korean Institute of Information, Electronics and Communication Technology (KIIECT)
2008 – 2014	Member, Korean Institute of Information Technology (KIIT)

Computing Skills

Programming	C/C++, Python, Java, R, MATLAB, PHP, Latex, ITK, Docker
Operating Systems	Linux, MacOS, Windows

Honors and Awards

1. Faculty of the Year Award, KSEA Central Virginia Chapter, 2021
2. Fourth winner ($30,000) in the Artificial Intelligence (AI) Tracks at Sea Challenge (Faculty Advisor), 2020
3. Travel Grant ($350), KSEA SEED Workshop, 2019
4. Travel Grant ($350), KOCSEA Technical Symposium, 2017
5. 99th place out of 1972 teams (5.02%, bronze medal), Data Science Bowl 2017, Booz|Allen|Hamilton & Kaggle, 2017
6. 3rd place out of 11 teams, LUNGx SPIE-AAPM-NCI Lung Nodule Classification Challenge, 2015
7. Travel Grant ($350), KSEA SEED Workshop, 2015
8. Best presentation award, KIIT, 2014
9. Best paper award, KIIECT, 2012
10. 2nd place in Dasan best student research award, GIST, 2012
11. Best presentation award, KIIT, 2011
12. Best paper award, KIIT, 2008

13. Dasan scholarship recipient, GIST, 2008
14. Brain Korea 21 scholarship recipient, GIST, 2006-2012
15. Korean government supported full scholarship recipient, GIST, 2006-2012
16. Brain Korea 21 scholarship recipient, Korea Tech, 2003-2005
17. Korea Tech scholarship recipient, Korea Tech, 2003-2005

References

Upon request

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