

CURRICULUM VITAE

PETER F. CARACAPPA, PH.D., CHP

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SUMMARY

Dr. Caracappa has been a practicing health physicist for nearly 20 years, with more than a dozen of those as the radiation safety officer for increasingly broad and diverse programs. As the Chief Radiation Safety Officer for Columbia University, he has responsibility for broad-scope clinical and research licenses for radioactive material and radiation producing equipment, a large cyclotron facility, and permits for use over diverse geographic locations. The radiation safety program he leads encompasses the activities at Columbia University, Columbia University Medical Center, New York-Presbyterian Hospital, Barnard College, the New York State Psychiatric Institute, and affiliated medical practices, with licensing from City, State, and Federal authorities. He has previously been responsible for the health physics programs at a 100 MeV electron accelerator facility and a low-power research reactor. He is a Certified Health Physicist by the American Board of Health Physics.

Dr. Caracappa has served both full and part time on the faculty at Rensselaer Polytechnic Institute, and has over 15 years of experience as the primary instructor for courses in Nuclear Engineering and Health Physics, including diverse subjects such as radiation detection and instrumentation, health physics, nuclear physics, and laboratory experimentation. He has been an active participant in undergraduate research opportunities and department-wide capstone design projects. He has also been engaged in diverse research activities, including development and application of computational dosimetry models and methods to refine or improve dose calculation in operational, industrial, and medical applications. He is responsible for significant contributions to the development of tools to improve the quantification, tracking, and management of radiation dose from Computed Tomography examination, one of the largest contributors to medical radiation exposure. He has authored or co-authored over 25 peer-reviewed papers or proceedings and 100 conference presentation abstracts on a diverse set of topics.

For five years, Dr. Caracappa served as the Director of the Reactor Critical Facility (RCF), a 100-watt research reactor operated by Rensselaer Polytechnic Institute. The facility offers students the opportunity to train on the operation of the reactor and apply for licensing as a Senior Reactor Operator. It also provides a hands-on learning environment for all nuclear engineering students, and is engaged in an active research program of criticality, benchmarking, and reactivity worth measurements. Under his leadership, the facility won nearly \$1 million in sponsored research awards, which were the first major external projects awarded to the facility in nearly twenty years.

Following the nuclear accident at Fukushima Dai-ichi in March 2011, Dr. Caracappa appeared regularly in media coverage regarding the extent and impact of the radiological releases from the plant. He was sought after because he demonstrated the ability to communicate the information available and its implications in a fair, level-headed, and understandable manner. He appeared in the coverage of media outlets including *The Wall Street Journal*, *AP*, *Reuters*, *NPR's Morning Edition*, *Scientific American*, *Popular Mechanics*, and *PBS NewsHour*. He was recognized by the American Nuclear Society for his contributions to the response to the Fukushima Accident.

 EDUCATION

Ph.D., Nuclear Engineering and Sciences, Rensselaer Polytechnic Institute, December, 2006
THESIS TITLE: Development and Evaluation of a New Algorithm for Determining Radiation Dose to the Red Bone Marrow

M.A., Public Affairs and Policy, State University of New York at Albany, December, 2004
THESIS TITLE: Marketable Permits: Equity and Efficiency In Pollution Control Systems

M.S., Nuclear Engineering, Rensselaer Polytechnic Institute, May, 2001
THESIS TITLE: Calculation and Evaluation of Radiation Dose in Adult Male from Computed Tomography Examination.

B.S. cum laude, Engineering Physics, Rensselaer Polytechnic Institute, May, 1998

WORK EXPERIENCE

Chief Radiation Safety Officer May 2018-present
Executive Director, Radiation Safety Programs
 Environmental Health and Safety
 Columbia University, New York, NY

Director, Reactor Critical Facility January 2014-August 2018
 School of Engineering
 Rensselaer Polytechnic Institute, Troy, NY

Senior Lecturer January 2018-August 2018
 Department of Mechanical, Aerospace, and Nuclear Engineering
 Rensselaer Polytechnic Institute, Troy, NY

Clinical Assistant Professor (Lecturer after July 2011) July 2007-December 2017
 Department of Mechanical, Aerospace, and Nuclear Engineering
 Rensselaer Polytechnic Institute, Troy, NY

Radiation Safety Officer September 2003-June 2013
 Department of Environmental Health and Safety, Division of Human Resources
 Rensselaer Polytechnic Institute, Troy, NY

Research Associate & Adjunct Faculty September 2003-June 2007
 Department of Mechanical, Aerospace, and Nuclear Engineering
 Rensselaer Polytechnic Institute, Troy, NY

Radiation Safety Officer July 2001-September 2003
 University at Albany, State University of New York, Albany, NY

Environmental Health and Safety, Early Identification Program May 1998-June 2000
 General Electric, Corporate Research and Development, Niskayuna, NY

PROFESSIONAL CERTIFICATIONS

Certified Health Physicist, American Board of Health Physics, November 2005
Recertified through 2021

Intern Engineer, State of New York, January 2002

AWARDS AND HONORS

American Nuclear Society Presidential Citation, 2014

Elda E. Anderson Award, Health Physics Society, 2013

RPI School of Engineering Team Research Award (with Drs. X George Xu & Suvranu De), 2012

American Nuclear Society Presidential Citation, 2011

Health Physics Society Graduate Fellowship, 2000-2001

National Academy for Nuclear Training INPO Fellowship, 1998-1999

L. David Walthousen Award, RPI, 1998

Max Yeater Award, RPI, 1998

Alpha Nu Sigma, Nuclear Engineering Honor Society, 1997

TEACHING EXPERIENCE

1. Nuclear Instrumentation and Measurement (6 semesters)
 2. Radiological Engineering and Laboratory (11 semesters)
 3. Radiation Shielding (graduate – 3 semesters)
 4. Senior Design Project I & II (3 years)
 5. Fundamentals of Nuclear Engineering
 6. Applied Atomic and Nuclear Physics (4 semesters)
 7. Atomic and Nuclear Physics Applications (graduate)
 8. Nuclear Engineering and Engineering Physics Laboratory (7 semesters)
 9. Introduction to Fusion Devices and Systems (3 semesters)
 10. Introduction to Nuclear Engineering and Engineering Physics (10 semesters)
 11. Introduction to Engineering Design (3 semesters)
 12. Independent Study in Practical Radiation Safety
 13. Senior Design Project Group Advisor (6 years)
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GRADUATE STUDENT ADVISING

1. Mr. Mathieu Dupont
Research Advisor, Thesis Committee Co-chair, in progress
 2. Mr. Adam Weltz
Thesis Committee Member, “Application and Development of Microstructured Solid-State Neutron Detectors,” July 2017
 3. Mr. Sam Frey
Co-terminal Masters Project Advisor, “Overestimation of Dose by Commercially Available Optically Stimulated Luminescence Detectors for Low Energy X-rays,” December 2016
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4. Mr. Yiming Gao
Thesis Committee Member, “An Inverse Optimization Method for Patient-Specific CT Organ Dose Reduction Involving Tube Current Modulation,” May 2016
5. Mr. Lin Su
Thesis Committee Member, “Development and Application of a GPU-Based Fast Electron-Photon Coupled Monte Carlo Code for Radiation Therapy,” July 2014
6. Mr. Tianyu Liu
Thesis Committee Member, “Development of ARCHER-CT, a Parallel Monte Carlo Radiation Transport Code for Fast X-ray CT Imaging Dose Calculation using GPU and Coprocessor Technologies,” June 2014
7. Mr. Matthew Mille
Thesis Committee Member, “A Study Of Shape-Dependent Partial Volume Correction In PET Imaging Using Ellipsoidal Phantoms Fabricated Via Rapid Prototyping,” August 2013
8. Dr. Aiping Ding
Thesis Committee Member, “Development of a Radiation Dose Reporting Software for X-ray Computed Tomography (CT),” July 2012
9. Mr. Justin Clinton
Thesis Committee Member, “Optimization and Characterization of a Novel Self Powered Solid State Neutron Detector,” December 2011.
10. Mr. Bin Han
Thesis Committee Member, “Modeling and Optimization of a Time-Resolved Proton Radiographic Imaging System for Proton Cancer Treatment,” May 2011
11. Mr. Jinwei Gu
Thesis Committee Member, “Development of CT Scanner Model for Patient Organ Dose Calculations Using Monte Carlo Methods,” March 2010.
12. Mr. Yong Hom Na
Thesis Committee Member, “Deformable Adult Human Phantoms for Radiation Protection Dosimetry: Algorithms for Varying Body and Organ Size to Anatomical Data Covering 5th-95th Percentiles of the Population,” November 2009.
13. Mr. Juying Zhang
Thesis Committee Member, “A Pair of Mesh-Based Phantoms Representing ICRP-89 50th Percentile Adult Males and Females for Radiation Protection Dosimetry Using Monte Carlo Simulations,” March 2009.
14. Mr. Bryan Bednarz
Thesis Committee Member, “Detailed Modeling of a Varian Clinac 2100C,” July 2008.
15. Ms. Sharon Gallagher
Masters’ Project, Co-Adviser (with Dr. XG Xu), “Practical Radiation Safety Issues for a 100 MeV Electron Linear Accelerator Facility.” December 2005.

UNDERGRADUATE STUDENT RESEARCH ADVISING

1. Isabelle Peck, Tube Current Modulation Estimates for CT Exams (NSF Research Experience for Undergraduates participant), Summer 2017 and Spring 2018
 2. Rebecca Rice, Methods for Digital X-ray Organ Dose Calculations, Spring 2018
 3. Hiedi Niskanen, VirtualDoseCT Phantom Matching Algorithm, Summer 2016
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4. Shawn Allison, Interventional Radiography Dose Modeling, Spring 2015
5. Sam Frey, X-Ray Spectral Analysis with OSL, Summer 2014
6. Sean Moran, Multi-scale Voxel Model Performance Benchmark with MCNP, Summer 2014
7. Derek Fiedler, Computational Eye Dose Modeling, Fall 2013
8. Adam Morton, Radchromic Film Characterization, Spring 2013
9. Derek Fiedler, Computational Eye Dose Modeling, Fall 2012
10. Adam Morton, Applied Health Physics and Radiation Detection, Fall 2012
11. Jackie Burke, OSL System Calibration, Fall 2010
12. Brittany Jason, Gamma Source Calibrations, Summer 2010
13. Allyce Bolger, Mini-X Spectral Analysis Measurements, Summer 2010
14. Diana Marsh, Tissue Composition Uncertainty Analysis, Summer 2009
15. Diana Marsh, Activation of Air in the LINAC, Summer 2008
16. Jessica Hunter, 3D Visualization Tools, Summer 2008
17. Selby Miller, Activation of Air in the LINAC, Summer 2008
18. Diana Marsh, Applied Radiation Safety Practicum, Fall 2007
19. Randip Singh, Activation of Air in the LINAC, Fall 2007
20. Diana Marsh, Radiation Safety Program Development, Summer 2007
21. Matthew Reiff, Lab Historical Site Assessment and MARSSIM Planning, Summer 2006
22. Jason Kowalik, Lab Historical Site Assessment and MARSSIM Planning, Summer 2006
23. Justin Hanlon, Rapid Prototyping Lung Phantoms, Summer 2005
24. Matt Oakley, Rapid Prototyping Lung Phantom, Summer 2005
25. Matt Oakley, Radiation Detection and Measurement Summer 2004
26. Shawn Newmann, Radiation Safety Practicum, Fall 2003, Spring 2004

CONSULTING AND EXTERNAL WORK

1. Caracappa Health Physics, Owner/Principal, Feb 2008-present
Providing leak test services, training, and general radiation safety program consulting and advice to industrial clients
2. Virtual Phantoms, Inc., Chief Technology Officer, Jan 2013-present
Oversees development and promotes commercial deployment of the VirtualDoseCT system
3. Navarro Research and Engineering, Inc., Contractor, March 2015-March 2016
Contracted to provide support for NRC review of research reactor license amendment applications

PEER REVIEWED PUBLICATIONS

h-index = 10

1. Ding A, Gao Y, Liu H, Caracappa PF, Long DJ, Bolch WE, Liu B, Xu XG. VirtualDose: a software for reporting organ doses from CT for adult and pediatric patients. *Physics in Medicine and Biology* 60(14):5601-5625, 2015.
2. Caracappa PF, Rhodes AM, Feidler DA, Multi-scale voxel phantom modeling: a high resolution eye model for computational dosimetry. *Physics in Medicine and Biology* 59: 5261-5275, 2014.

3. Vazquez JA, Caracappa PF, Xu XG. Development of Posture-Specific Computational Phantoms Using Motion Capture Technology and Application to Radiation Dose Reconstruction for the 1999 Tokaimura Nuclear Criticality Accident. *Physics in Medicine and Biology* 59: 5277-5286, 2014.
4. Vazquez JA, Caracappa PF, Xu XG. A Dose-Reconstruction Study of the 1997 Sarov Criticality Accident Using Animated Dosimetry Techniques. *Health Physics Journal* 106(5):571-582, 2014.
5. Gu J, Xu XG, Caracappa PF, Liu B. Fetal Doses to Pregnant Patients from CT With Tube Current Modulation Calculated Using Monte Carlo Simulations and Realistic Phantoms. *Radiation Protection Dosimetry* 155 (1): 64-72, 2013.
6. Ding A, Mille M, Liu T, Caracappa PF, Xu XG. Extension of RPI-adult male and female computational phantoms to obese patients and a Monte Carlo study of the effect on CT imaging dose. *Phys. Med. Biol.* 57(9): 2441-2459, 2012.
7. Han B, Zhang J, Na YH, Caracappa PF, Xu XG. Modeling And Monte Carlo Organ Dose Calculations For Workers Walking On Ground Contaminated With Cs-137 And Co-60 Gamma Sources. *Radiation Protection Dosimetry* 143(3):299-304, 2010.
8. Na YH, Zhang B, Zhang J, Caracappa PF, Xu XG. Deformable adult human phantoms for radiation protection dosimetry: anthropometric data representing size distributions of adult worker populations and software algorithms. *Phys. Med. Biol.* 55:3789-3811, 2010.
9. Liu H, Gu J, Caracappa PF, Xu XG. Comparison of two types of adult phantoms in terms of organ doses from diagnostic CT procedures. *Phys. Med. Biol.* 55:1441-1451, 2010.
10. Zhang JY, Na YH, Caracappa PF, Xu XG. RPI-AM and RPI-AF, a pair of mesh-based, size-adjustable adult male and female computational phantoms using ICRP-89 parameters and their calculations for organ doses from monoenergetic photon beams. *Phys. Med. Biol.* 54:5885-5908, 2009.
11. Gu J, Bednarz B, Caracappa PF, Xu XG. The development, validation and application of a multi-detector CT (MDCT) scanner model for assessing organ doses to the pregnant patient and her fetus using Monte Carlo methods. *Phys. Med. Biol.* 54:2699-2717, 2009.
12. Caracappa PF, Chao TC, Xu XG. A Study Of Predicted Bone Marrow Distribution On Calculated Marrow Dose From External Radiation Exposures Using Two Sets Of Image Data For The Same Individual. *Health Phys.* 96(6):661– 674; 2009.
13. Leone J., Furler M., Oakley M., Caracappa P., Wang B., Xu X. G. Dose Mapping for a Cs-137 calibration source using MCNP5 Mesh Tallies. *Op. Rad. Safety.* 88(2) Suppl. 1:S31-S33, 2005.

FULL PAPER PROCEEDINGS

14. Dupont M, Eklund M, Ji W, Caracappa PF. Development of Critical Experiments to Provide Validation Data for Multiphysics Coupling Codes. *Proceedings of PHYSOR 2018, Cancun, Mexico, 2018.*
15. Eklund M, Dupont M, Caracappa PF, Ji W. Neutronics Modeling and Simulation of Temperature-Dependent Experiments Performed at the Walthousen Reactor Critical

- Facility (RCF) Using Proteus-SN. Proceedings of PHYSOR 2018, Cancun, Mexico, 2018.
16. Lin H, Liu T, Su L, Bednarz B, Caracappa PF, Xu XG. Modeling of Radiotherapy Linac Source Terms Using ARCHER Monte Carlo Code: Performance Comparison for GPU and MIC Parallel Computing Devices. ICRS-13 and RPSD-2016, Paris, France, October 3-6, 2016.
 17. Liu T, Wolfe N, Lin H, Zieb K, Ji W, Caracappa PF, Carothers C, Xu XG. Performance Study of Monte Carlo Codes on Xeon Phi Coprocessors — Testing MCNP 6.1 and Profiling ARCHER Geometry Module on the FS7ONNi Problem. ICRS-13 and RPSD-2016, Paris, France, October 3-6, 2016.
 18. Zieb K, Lin H, Ji W, Caracappa PF, Xu XG. Preliminary Investigation of MCNP6 Unstructured Mesh Geometry for Radiation Flux Calculations Involving Space Environment. Joint International Conference on Mathematics and Computation, Supercomputing in Nuclear Applications, and Monte Carlo 2015. Nashville, TN. April 19-23, 2015.
 19. Lin H, Zieb K, Gao Y, Ji W, Caracappa PF, Xu XG. Development of a whole-body tetrahedral mesh human phantom for radiation dose calculations using new MCNP 6.1 geometrical features. Joint International Conference on Mathematics and Computation, Supercomputing in Nuclear Applications, and Monte Carlo 2015. Nashville, TN. April 19-23, 2015.
 20. Caracappa PF, Rhodes AM, Fiedler DA, Ding A. An Eye Model for Computational Dosimetry Using A Multi-Scale Voxel Phantom. Joint International Conference on Supercomputing in Nuclear Applications and Monte Carlo 2013. Paris, France, October 27-31, 2013.
 21. Caracappa PF, Ding A, Xu XG. Interpolation Method for Calculation of Computed Tomography Dose from Angular Varying Tube Current. Joint International Conference on Supercomputing in Nuclear Applications and Monte Carlo 2013. Paris, France, October 27-31, 2013.
 22. Caracappa, PF. Reconstruction of Airborne Activity Concentrations from Radiation Exposure Records. International Meeting on Severe Accident Assessment and Management: Lessons Learned from Fukushima Dai-ichi, 2012.
 23. Caracappa, PF. Evaluation of Prospective Dosimetry for Members of the Public Following the Fukushima Accident. International Meeting on Severe Accident Assessment and Management: Lessons Learned from Fukushima Dai-ichi, 2012.
 24. Caracappa PF, Xu XG, Gu J. Modeling Of Tube Current Modulation Methods In Computed Tomography Dose Calculations For Adult And Pregnant Patients. Proceedings of the International Conference on Mathematics and Computational Methods applied to Nuclear Science and Engineering, 2011.
 25. Ding A.P.,Gu J.W.,Liu H.K., Caracappa P. and Xu X.G. A Software Package for Reporting Multidetector CT (MDCT) Doses. Proceedings of the International Conference on Advances in Mathematics, Computational Methods, and Reactor Physics, 2009.
 26. Gu J.W., Caracappa P. and Xu X.G. Multidetector CT (MDCT) modeling for organ dose assessments of various patient phantoms. Proceedings of the International Conference on Advances in Mathematics, Computational Methods, and Reactor Physics. 2009.
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27. Caracappa P., Xu X.G. Integration Of Computer Aided Design For Monte Carlo Simulations. *The Monte Carlo Method: Versatility Unbounded In A Dynamic Computing World*. American Nuclear Society (ISBN: 0-89448-695-0), 2005.

REVIEWED CONFERENCE ABSTRACTS

28. Eklund M, Dupont M, Caracappa PF, Ji W. Neutronics Simulations of the RPI Walthousen Reactor Critical Facility (RCF) Using Proteus-SN Trans. Amer. Nuc. Soc. 117:114-115, 2017.
29. Dupont M, Eklund M, Ji W, Caracappa PF. Design of Neutronics and Thermal Hydraulics Coupling Critical Experiments Trans. Amer. Nuc. Soc. 117:155-156, 2017.
30. Tsapaki, V, Fitousi, N, Caracappa, P, Jacobs, J, Papailiou, I. Computed Tomography Chest and Abdomen Organ Doses Estimation Using a Dose Management Tool. Med. Phys., 44(6):3071, 2017.
31. Dupont M, Eklund M, Ji W, Caracappa PF. Development of Critical Experiments to Benchmark Moderator Temperature Reactivity Worth. Trans. Amer. Nuc. Soc. 115:142-144, 2016.
32. Eklund M, Dupont M, Caracappa PF, Ji W. Computational Modeling, Simulation, and Analysis of the RPI Walthousen Reactor Critical Facility (RCF). Trans. Amer. Nuc. Soc. 115:112-114, 2016.
33. Bahran R, Hutchinson J, Arthur JA, Sood A, Caracappa P, Thompson N, Pozzi S. Development of a Research Reactor Protocol for Neutron Multiplication Measurements. Trans. Amer. Nuc. Soc. 115: 928-930, 2016.
34. Xu XG, Lin H, Gao Y, Caracappa P, Wang Y, Huo W, Pi Y, Feng M, Chen Z, Dauer L. Monte Carlo Assessment of Dose to the Lens of the Eye of Radiologist Using Realistic Phantoms and Eyeglass Models. Med. Phys. 43(6): 3750, 2016.
35. Liu T, Lin H, Gao Y, Caracappa P, Wang G, Cong W, Xu XG. Radiation Dose Simulation for a Newly Proposed Dynamic Bowtie Filters for CT Using Fast Monte Carlo Methods. Med. Phys. 43(6): 3861, 2016.
36. Gao Y, Lin H, Liu T, Li X, Liu B, Khawaja R, Kalra M, Caracappa P, Xu XG. Simulation Study of Patient Off-Centering Effect On Organ Dose in Chest CT Scan. Med. Phys. 42(6): 3544, 2015.
37. Gao Y, Liu T, Li X, Liu B, Kalra M, Caracappa P, Xu XG. A Preliminary Method of Risk-Informed Optimization of Tube Current Modulation for Dose Reduction in CT. Med. Phys. 42(6): 3622, 2015.
38. Liu T, Su L, Du X, Lin H, Zieb Z, Ji W, Caracappa PF, Xu XG. Parallel Monte Carlo Methods for Heterogeneous Hardware Computer Systems Using GPUs and Coprocessors: Recent Development of ARCHER Code. *Trans. Am. Nuc. Soc.* Vol. 112.
39. Du X, Liu T, Su L, Ji W, Caracappa PF, Xu XG. Development of CSG-based Radiation Shielding Module for ARCHER: Preliminary Results for Photons. RPSD 2014, Knoxville, TN, Sept 14-18, 2014.
40. Liu T, Su L, Du X, Lin H, Zieb K, Ji W, Caracappa PF, Xu XG. Parallel Monte Carlo Methods for Heterogeneous Hardware Computer Systems Using GPUs and Coprocessors: Recent Development of ARCHER Code. RPSD 2014, Knoxville, TN, Sept 14-18, 2014.

41. Caracappa PF, Gao Y, Ding A, Xu XG. Evaluation of Computed Tomography Dose Using a Family of Virtual Patients. *Health Phys.* 107(1): S83, 2014.
42. Du X, Liu T, Su L, Caracappa PF, Xu XG. Extension of ARCHER Monte Carlo Code to Health Physics Dosimetry and Shielding Design: Preliminary Results. *Health Phys.* 107(1): S38, 2014.
43. Gao Y, Caracappa PF, Xu XG. How to Use VirtualDose to Track Patient Organ Doses. *Health Phys.* 107(1): S100, 2014.
44. Lin H, Liu T, Su L, Du X, Gao Y, Caracappa PF, Xu XG. Formation of Computational Phantoms from CT Numbers for Use in the ARCHER Monte Carlo Code. *Health Phys.* 107(1): S98, 2014.
45. Liu T, Su L, Du X, Caracappa PF, Xu XG. Comparison of Accuracy and Speed of ARCHER with MCNP for Organ Dose Calculations from External Photon Beams Under Standard Irradiation Geometries. *Health Phys.* 107(1): S114, 2014.
46. Zieb K, Gao Y, Caracappa PF, Xu XG, Lee K. Investigation of Crew Member Postures for Space Radiation Dosimetry. *Health Phys.* 107(1): S35, 2014.
47. Gao Y, Ding A, Caracappa PF, Xu XG. Dose-Length-Product-to-Effective-Dose Conversion Factors for Overweight and Obese Patients in X-ray Computed Tomography Examinations. 58th Annual Health Physics Society Meeting, Madison, WI, July 7-11, 2013.
48. Gao Y, Ding A, Caracappa PF, Xu XG. A Monte Carlo Method to Compute Patient Dose for Chest Computed Tomography Scans Involving Tube Current Modulation. 58th Annual Health Physics Society Meeting, Madison, WI, July 7-11, 2013.
49. Rhodes AM, Fiedler DA, Caracappa PF. A Model for Eye Lens Dose and Whole Body Dose in Interventional Radiology. 58th Annual Meeting of the Health Physics Society, Madison, WI, July 7-11, 2013.
50. Vazquez JA, Caracappa PF, Xu XG. A Dose-Reconstruction Simulation of the 1999 Tokai-Mura Criticality Accident with Victim Postures Modeled Using a Dynamic Computational Human Phantom and Motion Capture Data. 58th Annual Health Physics Society Meeting, Madison, WI, July 7-11, 2013.
51. Ding A, Gao Y, Caracappa PF, Xu XG. An Update of the Development and Clinical Testing of VirtualDose Software Used for Reporting CT Doses. 2013 American Nuclear Society Annual Meeting, Atlanta, GA, June 16-20, 2013.
52. Rhodes AM, Fiedler DA, Caracappa PF. Computational Eye Model for Interventional Radiology Dosimetry and Multi-Scale Whole-body Phantoms. 2013 American Nuclear Society Annual Meeting, Atlanta, GA, June 16-20, 2013.
53. Rhodes AM, Vazquez JA, Gao Y, Caracappa PF, Xu XG. Impacts of the Adoption of ICRP 103: A Reactor Study. 2013 American Nuclear Society Annual Meeting, Atlanta, GA, June 16-20, 2013.
54. Vazquez JA, Caracappa PF, Xu XG. "A Dose-Reconstruction Simulation of the 1999 Tokaimura Criticality Accident Using Motion Capture Data to Simulate Worker Posture" 2012 ANS Annual Meeting, Atlanta, GA, June 16-20, 2013.
55. Caracappa PF. Multi-Scale Voxel Phantom Modeling: Demonstration with a High Resolution Eye Model. 4th International Workshop On Computational Phantoms For Radiation Protection, Imaging And Radiotherapy, Zurich, Switzerland. May 2013.

56. Rhodes AM, Fiedler DA, Caracappa PF. Development of a Computational Eye Model for Use with Whole-body Phantoms. 46th Midyear Meeting of the Health Physics Society, Scottsdale, AZ, January 27-30, 2013.
57. Su L, Liu T, Ding A, Xu XG. A GPU/CUDA Based Monte Carlo Code for Proton Transport: Preliminary Results of Proton Depth Dose in Water. *Med. Phys.* 39(6):3945, 2012.
58. Ding A, Gao Y, Caracappa PF, Liu B, Xu XG. Design and Testing of the VirtualDose Software under the Software as a Service (SaaS) Platform for Tracking and Reporting CT Doses. *Med. Phys.* 39(6):3876, 2012.
59. Ding A, Gao Y, Caracappa PF, Long D, Bolch W, Xu XG. A Comprehensive CT Organ Dose Database for Weight-Specific Adult and Pediatric Patients. *Med. Phys.* 39(6):3940, 2012.
60. Gao Y, Ding A, Caracappa PF, Xu XG. Position Sensitivity of Calculated Dose-Length-Product-To-Effective-Dose Conversion Factors in Computed Tomography Examination. *Med. Phys.* 39(6):3607, 2012.
61. Bollinger BG, Su L, Caracappa PF, Xu XG. Dosimetric Implications of the New ICRP 103 Recommendations on Radiation Protection Regulations in the U.S. 57th Annual Meeting of the Health Physics Society, Sacramento, CA, July 22-26, 2012.
62. Ding A, Gao Y, Caracappa PF, Xu XG. CT Dose Reporting with the VirtualDose Software: Database and Software Testing for Clinical Users. 57th Annual Meeting of the Health Physics Society, Sacramento, CA, July 22-26, 2012.
63. Gao Y, Ding A, Caracappa PF, Xu XG. Position Sensitivity of Calculated Dose-Length-Product-to-Effective-Dose Conversion Factors in Computed Tomography Examination. 57th Annual Meeting of the Health Physics Society, Sacramento, CA, July 22-26, 2012.
64. Vazquez JA, Ding A, Caracappa PF, Xu XG. A Deformable Computational Human Phantom for Animated Radiation Dosimetry Simulation Using Motion-Capture Data. 57th Annual Meeting of the Health Physics Society, Sacramento, CA, July 22-26, 2012.
65. Vazquez J, Ding A, Liu T, Su L, Gao Y, Mille M, Caracappa PF, Xu XG. Current Research Pursuits the Rensselaer Radiation Measurement and Dosimetry Group. The American Nuclear Society 2012 Student Conference, Las Vegas, Nevada, April 12-15, 2012.
66. Caracappa PF, Xu XG. Invited 30-Min Talk: The Impact of the ICRP-103 Recommendations on Radiation Protection and Shielding against External Photon and Neutron Beams. World Congress on Medical Physics and Biomedical Engineering, Beijing, China, May 26-31, 2012.
67. Xu XG, Ding A, Caracappa PF. Mini-Symposium on Patient Safety and Radiation Dose Tracking for CT and Other Medical Procedures: Virtualdose Software for CT Dose Tracking Involving Deformable and Personalized Phantoms. World Congress on Medical Physics and Biomedical Engineering, Beijing, China, May 26-31, 2012.
68. Xu XG, Caracappa PF, Ding A, Mille M, Liu T, Su L. Mini-Symposium on "Visible Human Projects in the United States, Korea and China and Applications to Radiation Dosimetry": Visible Human Project in the US and RPI Deformable Phantoms for Radiation Dosimetry. World Congress on Medical Physics and Biomedical Engineering, Beijing, China, May 26-31, 2012.
69. Ding A, Mille M, Caracappa PF, Xu XG. A New Class of Obese Phantoms for Radiation Protection Dosimetry. *Transactions of the American Nuclear Society*, 105(721), 2011.

70. Caracappa PF, Ding A, Gu J, Liu B, Xu XG. Organ Dose Weighting Methods for Tube Current Modulated CT Exams: Demonstration Using Adult Patient Phantoms. *Med. Phys.* 38(6): 3843, 2011.
71. Ding A, Schulte N, Caracappa PF, Xu XG. Further Development of VirtualDose Software for CT Dose Assessment: Realistic Phantoms and Smartphone User Interfaces. *Med. Phys.* 38(6): 3877, 2011.
72. Ding A, Mille M, Caracappa PF, Xu XG. Impact of Body Size of Obese Patients on PET/CT Dose Estimates: Monte Carlo Calculations Using a Set of BMI-Adjustable Phantoms. *Med. Phys.* 38(6): 3843, 2011.
73. Liu T, Ding A, Caracappa PF, Xu XG. Modeling of obese individuals using automatic deformation of mesh-based computational phantoms. *Health Phys.* 101(1): S34, 2011.
74. Mille M, Ding A, Liu T, Na Y-H, Caracappa PF, Xu XG. The effect of patient obesity on PET/CT imaging dose using a phantom with a body mass index of 45. *Health Phys.* 101(1): S31, 2011.
75. Schulte N, Xu WM, Ding A, Caracappa PF, Xu XG. A SmartPhone APP for tracking medical CT doses. *Health Phys.* 101(1): S28, 2011.
76. Vazquez JA, Ding A, Caracappa PF, Xu XG. Integration of human models with a virtual cityscape model for use in radiation-related event simulation. *Health Phys.* 101(1): S70, 2011.
77. Caracappa PF, Trumbull T, Haley T, Huguet MP, Ji W, Danon Y, Sones B, Gillich D. Making the Most of Hands-On Learning – An Integrated Course at Rensselaer. *Transactions of the American Nuclear Society*, 103(124), 2010.
78. Caracappa PF, Gu J, Xu XG. Organ-Specific Adjustment Factors for Calculating Dose from Any CT Scanner. *Med. Phys.* 37(6): 3100, 2010.
79. Ding A, Gu J, Caracappa PF, Xu XG. Development and Testing of a CT Dose Software “VirtualDose” Using Anatomically Realistic Patient Phantoms: Preliminary Results for the Phase I of the project. *Med. Phys.* 37(6): 3100, 2010.
80. Na Y, Ding A, Caracappa PF, Xu XG. Demonstration of the Ability to Morph an Existing Whole-body Phantom to a Different Individual. *Med. Phys.* 37(6): 3146, 2010
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88. Caracappa P, Gu J, Zhang J, Xu X. The Impact of the new ICRP-103 Recommendations on the Assessment of Effective Doses from CT Procedures. *Med. Phys.* 36(6): 2727, 2009.
89. Ding A, Gu J, Liu H, Caracappa P, Xu X G. The Need and Feasibility of a Modern Software for Reporting Patient Doses from CT Scans. *Med. Phys.* 36(6): 2727, 2009.
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101. Caracappa, P. F. Cellularity in Skeletal Dosimetry. *Transactions of the American Nuclear Society*, 99(67), 2008.
102. Caracappa P.F., Miller S., Marsh D. Activation of Air in Linear Accelerator Facilities. *Health Phys.* 95(1): S45, 2008.
103. Gu JW, Taranenko V, Bednarz B, Caracappa PF, Xu XG. A preliminary study to assess dose to pregnant females and fetuses undergoing CT examinations. *Health Phys.* 95(1): S51, 2008.
104. Gibb R, Hanlon J, Melnick S, Salazar D, Trelease A, Caracappa PF. Continuous Radionuclide Water Quality Analysis. *Health Phys.* 93(1): S84, 2007.
105. Caracappa PF. Historical Site Assessment of University Facilities. *Health Phys.* 93(1): S60, 2007.
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108. Caracappa PF, Xu XG. A Revised Method of Estimating Red Bone Marrow Dose in Image-based Computational Models. Health Phys. 90(6): S122, 2006.
109. Caracappa PF. Radiation Safety for Enclosed X-Ray Systems in the University Setting. Health Phys. 90(6): S95, 2006.
110. Caracappa PF and Block RC. A Safety Analysis of a Reconfigurable Linac Target. Health Phys. 89(1): S35, 2005.
111. Caracappa PF. Radiation Awareness Training for University First Responder Personnel. Health Phys. 89(1): S48, 2005.
112. Furler M, Leone J, May S, Caracappa PF, Xu XG. A Senior Design Project to Combine Computer Aided Design (CAD) and the MCNP code. Health Phys. 89(1): S31, 2005.
113. Caracappa PF. The Need for Public Comments in Nuclear-Related Rulemaking. Transactions of the American Nuclear Society, 91(1009), 2004.
114. Caracappa PF, Ryan RM, Xu XG. Determination of Patient Dose from Computed Tomography Examination. Health Phys. 78(6): S120, 2000.
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INVITED PRESENTATIONS

116. Caracappa, PF. Critical Experiments for Coupled Multiphysics Validation. Nuclear Energy Lecture Series, Oak Ridge National Laboratory, 2018.
117. Caracappa, PF. Overcoming Fear to Behave Ethically. Panel, American Nuclear Society Winter Meeting 2014, Anaheim, CA.
118. Caracappa, PF. Radionuclide Release at Fukushima. American Nuclear Society Connecticut Section, November 16, 2011.
119. Caracappa, PF. Radiation and Health Physics in Relation to the Fukushima Events. American Nuclear Society Teacher Workshop on Nuclear Science and Technology, October 29, 2011
120. Caracappa, PF. Radiation and Fukushima: Risks, Releases, and Impacts. Southern California Chapter RPI Alumni Association, July 27, 2011.
121. Caracappa, PF. Radiation and Health Physics in Relation to the Fukushima Events. American Nuclear Society Teacher Workshop on Nuclear Science and Technology, June 25, 2011
122. Caracappa, PF. Fukushima Accident: Radioactive Releases and Potential Dose Consequences. American Nuclear Society Annual Meeting, June 2011.
123. Caracappa PF. "Radiation Safety Without Borders Special Section – Mission to Ecuador" Health Physics Society Annual Meeting, July 2004
124. Caracappa PF. "Fighting Global Climate Change: A Nuclear Engineer's Experience at the World Climate Change Conference" Northeastern New York Section, American Nuclear Society, March 2001
125. Caracappa PF. "Comparison of Measured CTDI and Calculated Effective Dose for CT Examination" Council on Ionizing Radiation Measurements and Standards Annual Meeting, October 2000 – Travel Grant Winner

NON REFEREED PUBLICATIONS

126. Caracappa, Peter F. The Nuclear Fuel Cycle: Reprocessing and Recycling for Power. *Journal of Engineering and Public Policy*, Vol. 1 (1997).

SPONSORED RESEARCH*Principal Investigator*

1. Development of Critical Experiments to Provide Validation Data for Multiphysics Coupling Methods
Nuclear Energy University Programs, Department of Energy
\$800,000 – 10/2015 to 9/2018
2. Spatial Correlation Function Measurements
Bechtel Marine Propulsion Corporation
\$17,076 – 8/2017 to 12/2017
3. Critical and Subcritical Experiments for Neutron Detection Measurements
Bechtel Marine Propulsion Corporation
\$19,524 – 6/2016 to 12/2016
4. ARCHER: An Extremely Fast Medical Radiation Dose Computing Software
Virtual Phantoms, Inc., via NIH STTR
\$313,307 – 12/2015 to 9/2018
5. VirtualDose Software for Diagnostic CT Doses to Adults and Children
Virtual Phantoms, Inc., via NIH STTR
\$177,000 – 9/2010 to 2/2014
6. RPI-NRC Graduate Fellowships
Graduate Fellowship Program, Nuclear Regulatory Commission
\$400,000 – 8/2008 to 8/2012

Co-Principal Investigator

1. RPI-NRC Graduate Fellowships
NRC Graduate Fellowship Program PI: W. Ji
\$400,000 – 8/2013 to 8/2017
2. 4D Visible Human Modeling for Radiation Dosimetry
NIH “Recovery Act” Project Revision, PI: XG Xu
\$224,092 – 7/2009 to 6/2011
3. New Teaching and R&D Laboratory Experiments at Rensselaer Polytechnic Institute
DOE Infrastructure Award, PI: Y Danon
\$134,011 – 8/2009 to 7/2010
4. Hands-On Nuclear Engineering Education – A New Integrated Course
NRC Curriculum Development Award, PI: Y Danon
\$140,000 – 8/2009 to 7/2010

PROFESSIONAL AFFILIATIONS

American Nuclear Society

Student Member, November 1994-September 2001

Member, September 2001-present

Radiation Protection and Shielding Division

Program Committee Chair, November 2012-November 2016

Executive Committee, June 2013-present

Education and Training Division

Executive Committee, June 2005-June 2013

Chair, June 2011-June 2012

1st Vice Chair, June 2010-June 2011

2nd Vice Chair, June 2009-June 2010

Secretary, June 2008-June 2009

Program Committee Chair, June 2007-June 2010

Young Members Group

Executive Committee, June 2005-June 2006, June 2007-June 2012

Chair, June 2010-June 2011

Vice Chair, June 2009-June 2010

ANSI/ANS 6.6.1, Member

ANSI/ANS 6.4.2, Member

Special Committee on Fukushima, Health Physics and Radiation Biology Subcommittee

Membership Committee

Member, November 2010-June 2017

Chair, June 2012-June 2015

Bylaws and Rules Committee

Member, June 2006-present

Vice-Chair, June 2016-present

Student Sections Committee

Chair, June 2003-June 2006

Member, June 2000-June 2009

Public Policy Committee

Member, June 1999-June 2005

Advisor, RPI Student Section, March 2004-present

Health Physics Society

Plenary Member, November 2001-present

Northeastern New York Section President, January 2006-November 2007

ANSI/HPS 13.58 Working Group, Member

American Association of Physicists in Medicine

Plenary Member, March 2009-present

TECHNICAL PROGRAM AND PUBLICATION SERVICE

ANS Annual Meeting, June 2015, Assistant Technical Program Chair

RPSD 2014, Technical Program Committee

Young Professionals Congress 2011, General Chair

International Conference on Mathematics and Computational Methods applied to Nuclear
Science and Engineering 2011, Technical Program Committee

Conference on Nuclear Training and Education 2011, Technical Program Committee

ANS Radiation Protection and Shielding Topical Meeting, 2009, Technical Program Committee

Medical Physics

Reviewer, 2010-present, Associate Editor, 2011-present

Health Physics Journal

Reviewer, 2011-present

Physics in Medicine and Biology

Reviewer, 2011-present

Journal of Radiological Protection

Reviewer, 2014-present