

CURRICULUM VITAE — SANDY NAPEL

March 2023

Home Address:

Work Address: Department of Radiology
James H. Clark Center
318 Campus Drive, Room S323
Stanford, CA 94305-5450

Date of Birth: February 23, 1952
Place of Birth: New York, USA
Citizenship: USA
Marital Status: Married

Degrees

1974	SUNY at Stony Brook B.S.	Engineering Sciences
1976	Stanford University M.S.	Electrical Engineering
1981	Stanford University Ph.D.	Electrical Engineering

Principal Positions Held — Academic

1972-74	Brookhaven National Laboratory Department of Applied Sciences Upton, New York USA	Research Assistant
1976-77	Stanford University Department of Electrical Engineering Stanford, California USA	Teaching Fellow
1978-79	Stanford University Department of Electrical Engineering Stanford, California USA	Acting Instructor
1977-81	Stanford University Department of Electrical Engineering Stanford, California USA	Research Assistant
1981-88	University of California Department of Radiology San Francisco, California USA	Adj. Asst. Professor
1988-91	University of Western Ontario, Dept. of Diagnostic Radiology and Nuclear Medicine London, Ontario Canada	Visiting Asst. Professor

1991-97	Stanford University Departments of Radiology, and Electrical Engineering (by courtesy) Stanford University Medical School Stanford, California USA	Assistant Professor
1997-03	Stanford University Departments of Radiology, and Electrical Engineering (by courtesy) Medicine (by courtesy) Stanford University Medical School Stanford, California USA	Associate Professor
2003-	Stanford University Departments of Radiology, and Electrical Engineering (by courtesy) Medicine (by courtesy) Stanford University Medical School Stanford, California USA	Professor
1996-	co-Director, Radiology 3D and Quantitative Imaging Lab Stanford University Department of Radiology	
2008-2019	co-Division Chief, Integrative Biomedical Imaging Informatics Stanford University Department of Radiology	
2019-	Division Chief, Integrative Biomedical Imaging Informatics Stanford University Department of Radiology	
2015-	co-Chair, Appointments and Promotions Committee Stanford University Department of Radiology	
2019-	Chair, Appointments and Promotions Committee Stanford University Department of Radiology	

Principal Positions Held — Industrial

Imatron, Inc.
389 Oyster Point Blvd.
So. San Francisco, California 94080:

1981-83	Manager of Computer Systems
1983-84	Director of Computer Science
1984-86	Associate VP of Computer Science
1986-87	VP of Computer Science
1987-89	VP of Engineering

Honors and Awards

1972	Tau Beta Pi (SUNY Stony Brook Chapter President 1973-74)
1974	SUNY Stony Brook Engineering Commencement Valedictorian
1988-89	Medical Research Council of Canada: Visiting Scientist Award

- 1989-90 National Sciences and Engineering Research Council of Canada: Visiting Industrial Fellowship
- 1991 Society of Computed Body Tomography *Cum Laude* Award for Presentation: Optimization of Breath-held Pulmonary Magnetic Resonance Angiography
- 1992 Stanford University William M. Hume Faculty Scholar Award
- 1992 Radiological Society of North America *Magna Cum Laude* Award for Scientific Exhibit: Abdominal Spiral CT Angiography: A Minimally Invasive Three-Dimensional Alternative to Arteriography.
- 1992 Radiological Society of North America *Certificate of Merit* Award for Scientific Exhibit: SMaRT: A Computer-based MR Teaching File
- 1993 Society of Computed Body Tomography *Cum Laude* Award for Presentation: 3D CT Angiography of Renal Artery Stenosis
- 1994 Society of Computed Body Tomography *Cum Laude* Award for Presentation: MRI of Pulmonary Embolism using Intravascular Contrast-enhanced 3D Fast Gradient Echo Technique in a Canine Model
- 1994 Society of Computed Body Tomography *Cum Laude* Award for Presentation: Pre- Operative Assessment of Living Renal Donors: Spiral CT as an Alternative to Conventional Angiography and Intravenous Urography
- 1994-97 Radiology Editor's *With Distinction* Recognition Award
- 1995 Uroradiology Society *Grand Prize* for Presentation: Reformatted Non-contrast Spiral CT in the Evaluation of Renal Colic
- 1996 Society of Computed Body Tomography *Cum Laude* Award for Presentation: Optimization of CT Parameters for Virtual Colonoscopy
- 1998 Society of Computed Body Tomography *Hounsfield* Award for Outstanding Paper: Volumetric Quantification of the Aorta and Its Branches: A Unique Application for CT Angiographic Data
- 1998 Society of Computed Body Tomography *Cum Laude* Award for A Better Gold Standard for Evaluation of Visualization Modes in CT Colonography
- 1998 Giovanni Di Chiro Award (1997) for Outstanding Scientific Research for paper: Comparison and Evaluation of Retrospective Intermodality Brain Image Registration Techniques, *J Comput Assist Tomogr*, **21**(4):554-566, 1997.
- 1999 Society of Computed Body Tomography *Cum Laude* Award for Multidetector spiral CT Colonography: maintaining image quality with rapid acquisition.
- 1999 RSNA *Research Trainee Prize* for Helical Artifacts in 1-Slice and 4-Slice CT: Quantitative and Qualitative Effects of Scanning Parameters and Object Position on a Simulated Blood Vessel Phantom

- 2000 Society of Computed Body Tomography *Hounsfield Award for Outstanding Scientific Paper* : Computer-Aided Polyp Detection Improves Reading Efficiency in CT Colonography
- 2001 RSNA *Research Trainee Prize* for Curved Thin Slab Maximum Intensity Projections (CTS-MIP): Method and Evaluation for CT Angiography.
- 2002 SCBT/MR *Hounsfield Award for Outstanding Scientific Paper*: Automated Detection of Pulmonary Nodules
- 2006 Society of Nuclear Medicine “Image of the Year” award for article: ‘Flying Through’ and ‘Flying Around’ a PET/CT scan: Pilot Study and Development of 3D Integrated 18F-FDG PET/CT for Virtual Bronchoscopy and Colonoscopy, J Nucl Med **47**:1081-1087, 2006.
- 2006 SCBT/MR *Hounsfield Award for Outstanding Scientific Paper*: Knowledge-based Algorithm for Automated Centerline Interpolation through Femoro-Popliteal Artery Occlusions in Peripheral CT Angiography (CTA)
- 2007 SCBT/MR *In Training Award for Best Young Investigator*: Promises and Limitations of Dual-Energy CT in Lower Extremity CT Angiography
- 2007 Society of Nuclear Medicine “Best Clinical Article”: ‘Flying Through’ and ‘Flying Around’ a PET/CT scan: Pilot Study and Development of 3D Integrated 18F-FDG PET/CT for Virtual Bronchoscopy and Colonoscopy, J Nucl Med **47**:1081-1087, 2006.
- 2009 Elected to the College of Fellows of the American Institute for Medical and Biological Engineering (AIMBE).
- 2012 Academy of Radiology Research 2012 Distinguished Investigator Award

Memberships in Professional Organizations

- 1972- Institute for Electrical and Electronics Engineers (IEEE): Acoustics, Speech and Signal Processing Society Social Implications of Technology Society
- 1991- American Association of Physicists in Medicine (AAPM)
- 1991-95 Society of Magnetic Resonance in Medicine (SMRM)
- 1991-95 Society of Magnetic Resonance Imaging (SMRI)
- 1995-2005 International Society of Magnetic Resonance in Medicine (ISMRM) (merger of SMRM and SMRI)
- 1995- Radiological Society of North America (RSNA)

Committee Membership

National

- 1994 American Association of Physicists in Medicine, Local Arrangements Chairman
- 1996-2000 Member, Program Committee, AAPM

1998-2002 Member, Program Committee, RSNA
 2001-2002 Chair: Physics subcommittee of the Program committee, RSNA
 2000 CARS 2000 Executive Committee
 2004-2009 American College of Radiology Imaging Network (ACRIN) National Lung Screening Trial (NLST) Computer-aided detection (CAD) Working Group
 2019-2023 American Association of Physicists in Medicine, Machine Learning Subcommittee (MLSC)
 2020-x NCI Clinical Trial and Translational Research Advisory Committee -- oversight committee

Local

1993 Radiation Producing Machine Committee, Stanford University School of Medicine
 1993 Co-Chair Committee on Teleradiology - Department of Radiology, Stanford University School of Medicine
 1997 Committee on Inter-School Collaboration and Future Alliances
 1999 Steering Committee, Medicine Meets Virtual Reality at Stanford

Review Activities

Scientific Journals

1989- Referee for Medical Physics
 1993- Referee for Radiology
 1994- Referee for IEEE Transactions on Medical Imaging
 1995- Referee for Journal of Computer Assisted Tomography
 2000- Referee for IEEE Transactions on Biomedical Engineering
 2002 Referee for Medical Image Analysis
 2009-2021 Associate Editor, Medical Image Analysis
 2011- Associate Editor, Radiology
 2014- Associate Editor, Journal of Medical Imaging

Abstracts for Scientific Meetings

1992,94 Referee for Siggraph Conference
 1993-2005 Referee for Radiological Society of North America Conference
 1994 Referee for Visualization in Biomedical Computing Conference
 1995 Referee for Volume Visualization '96 Conference
 1999 Referee for World Conference on Medical Physics 2000
 2000, 2010- Referee for MICCAI program, workshops

Teaching

1976-80 EE 274: The Computer as a Laboratory Instrument. Department of Electrical Engineering, Stanford University. Full responsibility for course.

- 1989-90 Biophysics 515A: Medical Imaging. University of Western Ontario. Lecturer.
- 1989-90 Biophysics 516B: Imaging Principles. University of Western Ontario. Lecturer.
- 1989-90 Physics of Radiology for Radiology Residents. Department of Diagnostic Radiology and Nuclear Medicine, University of Western Ontario. Lecturer.
- 1992-2012 Physics for Radiology Residents—Board Review. Stanford University School of Medicine. Lecturer and course director.
- 1993-2012 Radiological Physics. Stanford University School of Medicine. Lecturer.
- 1993-2006 Current Concepts of Magnetic Resonance, Post-graduate course hosted by Stanford University Medical School and Duke Medical Center. Laguna Niguel, CA (1993) and Monterey, CA (1994-). Faculty.
- 1994 Diagnostic Imaging Update, Post-graduate course hosted by Stanford University Medical School. Maui, HI. Faculty.
- 1994 Vascular Disease 1994: Diagnosis and Treatment. Post-graduate course hosted by Stanford University Medical School. Monterey, CA. Faculty.
- 1995 American Association of Physicists in Medicine Summer School: CT and US Technology and Applications. New London, CT. Faculty.
- 1997 Computed Tomography Update, Post-graduate course hosted by Stanford University Medical School. Jackson Hole, WY. (Basic Principles of Spiral CT, Basic Principles of CT Angiography)
- 1997 Advances in Electron Beam Computed Tomography, Hilton Head, SC, October 3-5, 1997
- 1999-2014 Annual International Symposium on Multidetector-Row CT. (various lectures on Principles of Multi Detector-Row CT, Data Explosion, virtual colonoscopy, CAD, visualization, decision support, etc.)
- 1999 Computed Tomography Update, post-graduate course hosted by Stanford University Medical School. Jackson Hole, WY. (Basic Principles of Spiral CT, Basic Principles of Multidetector CT, Basic Principles of CT Angiography)
- 1999 Short Course in Medical Imaging and Image Processing, Erlangen, Germany, October 14, 1999. (Basics and Applications of Post-processing Methods)
- 2000 Stanford University Course MIS 210-B—Medical Imaging. Medical Image Visualization (1/19/2000)
- 2000 Southeast Area Chapter of the American Association of Physicists in Medicine: Spring Symposium—Spiral & Multi-slice CT: Physical Principles & Medical Physicist Responsibilities (Multidetector CT: Interpretation, Display, and 3D Imaging Considerations) (3/16/2000)

- 2000 Stanford University Course ME 187/388/CS 123/MIS 187/287—
Biomedical Computation: Opportunities and Challenges. Medical Image
Visualization (3/29/2000)
- 2002-8 Stanford University Course ME-284, Cardiovascular Bioengineering.
Lecture: CT Imaging with Applications to Vascular Disease, Winter Qtr.
- 2003 Diagnostic Imaging Update, post-graduate course hosted by Stanford
University Medical School and Keio University. Poipu Beach, Kauai, HI.
(Volumetric CT: MDCT and Beyond, MDCT Data Explosion I: The
Problem and Potential Solutions for Vascular CT, MDCT Data Explosion
II: Potential Solutions for Cancer Detection), March 17-21.
- 2005 Diagnostic Imaging Update, post-graduate course hosted by Stanford
University Medical School and Keio University. Poipu Beach, Kauai, HI.
(Basic Principles of Multidetector CT: Four Slices and Beyond; Managing
Image Overload using Advanced Visualization and Computer-Aided
Navigation; CAD for CT: Concepts, Current Status, and Future
Prospects), March 28-April 1.
- 2009 Diagnostic Imaging Update, post-graduate course hosted by Stanford
University Medical School and Keio University. Wailea, Maui, HI. (CAD
for CT: Concepts, Current Status, and Future Prospects, Imaging
Informatics for Radiological Decision Support), March 23-27.
- 2010 RSNA 2010 Refresher Course on Decision Support in Clinical Practice:
Automated Image Retrieval based on Lesion and Case Similarity.
Chicago, November 2010.
- 2011-4 RSNA 2011-4 Refresher Course on Decision Support in Clinical Practice:
Quantitative Image Analysis for Image Retrieval, Decision Support, and
Knowledge Discovery. Chicago, November.
- 2013-5 RSNA 2013-5 Correlating Imaging with Human Genomics. Chicago,
December.
- 2015-7 RSNA 2015-7 Radiomics Mini Course, From Image to Radiomics: Image
Feature Computation and Considerations. Chicago, December
- 2016-7 RSNA 2016-7 Panel Discussion I: Imaging Integration with Cancer
Genomics/Proteomics: Methodologies Leveraging the Cancer Imaging
Archive

Graduate Student and Post-doc Supervision

University of Western Ontario:

Brian Reid	Ph. D.	Medical Biophysics	1989-90
thesis area: Microscopic Computed Tomography			

Stanford University:

H. Christian Davidson	M.S.	Medical Informatics*	1991-93
thesis area: Picture Archiving for Radiology			

Smadar Shiffman	Ph. D.	Medical Informatics*	1992-99
thesis area: Segmentation of Blood Vessels for CT Angiography			
Philippe G. Lacroute	Ph. D.	Electrical Engineering	1993-95
thesis area: Fast Volume Rendering Using a Shear-Warp Factorization of the Viewing Transform (3 rd reader)			
Chye H. Yan	Ph. D.	Electrical Engineering	1994-98
thesis area: Serial Registration of CT Scans for Quantitative Applications			
Shin Y. Yen	Ph. D.	Electrical Engineering	1994-99
thesis area: Resolution in Spiral CT and Volume Visualization of Medical Images			
David Paik	Ph. D.	Medical Informatics	1996-02
thesis area: Virtual Colonoscopy — Visualization, Path Planning, CAD			
Feng Zhuge	Ph. D.	Electrical Engineering	1999-06
thesis area: Quantification of structures in volumetric data			
Burak Gokturk	Ph. D.	Computer Science	1999-02
thesis area: Shape Recognition with Application to Medical Imaging (2 nd reader)			
Burak Acar	Post-doc	Radiology	1999-02
project: CAD of Colonic Polyps, Lung Nodules			
Kenneth Wang	Ph.D.	Mechanical Engineering	1999-01
thesis area: Level Set Methods for Computational Prototyping with Applications to Hemodynamic Modeling (2 nd reader)			
Grant M. Stevens	Ph.D.	Biophysics	1999-00
thesis area: Volumetric Tomographic Imaging (2 nd reader)			
Raghav Raman	Post-doc	Radiology	1999-03
project: Vascular Visualization and Quantitation			
Djamila Holmlund	M.S.	Visiting Student (Sweden)	2001-02
masters thesis: A Study on Radiological Visual Inspections and a User Study Focused on Ergonomic Input Devices.			
Ping Li	M.S.	Computer Science	2001-03
project: Virtual Colonoscopy Supine and Prone Matching, CAD			
Padma Sundaram	Ph.D.	Electrical Engineering	2001-07
thesis area: Virtual Colonoscopy CAD			
Michel Bilello	Post-doc	CS/Radiology	2002-03
project: CAD for Liver Lesions			
Joyoni Dey	post-doc	Radiology	2003-05
project: Interventional Room of the Future; registration, Human-computer interaction			
Markus Kukuk	post-doc	Radiology	2003-08
project: Advanced interventional visualization/registration			
Rong (Cindy) Shi	post-doc	Radiology	2003-07
project: Virtual Colonoscopy			

Shaohua Sun	Ph.D.	Electrical Engineering	2003-07
Thesis area: CAD lung and other cancer			
Anthony Sherbondy	Ph.D.	Electrical Engineering	2002-08
Thesis area: Advanced Visualization, Segmentation, CAD			
Tejas Rakshe	Ph.D.	Electrical Engineering	2003-08
Thesis area: Vascular Visualization			
Joong Ho Won	Ph.D.	Electrical Engineering	2004-09
Thesis area: Vascular Visualization			
Bindi-Pankhudi	M.S.	Computer Science	2004-06
A. J. Jayant Joshi	M.S.	Computer Science	2004-06
David Olsen	Ph.D.	School of Medicine	2006-07
Ushah K. K. Reddi	M.S.	Computer Science	2006-08
David Tran	M.D.	School of Medicine	2006-09
Jiajing Xu	Ph.D.	Electrical Engineering	2009-13
Thesis area: Quantitative Imaging			
Jessica Faruque	Ph.D.	Electrical Engineering	2007-14
Thesis area: Perception of Image Similarity, CBIR Systems			
Sebastian Echegaray	Ph.D.	Electrical Engineering	2013-17
Thesis area: Quantitative Imaging			
Shaimaa Bakr	M.S.	Electrical Engineering	2015-21
Thesis area: Quantitative Imaging			
Austin Ray	M.S.	Computer Science	2015-6
Stephen Chu	M.S.	Computer Science	2015-6
Huafei Wang	M.S.	Computer Science	2015-6
Sarah A. Mattonen	Ph.D.	Medical Physics	2017-9
Akshay Jaggi*	undergrad	Computer Science	2016-9
Eduardo Somoza	M.D.	SCIT T32 fellow	2019-21

**winner of the Angela Lee Undergraduate Research Award - most outstanding poster presented at the annual Achauer Undergraduate Honors Symposium.*

Grants—Current

NIH/NCI 5T32CA009695 3/01/93 – 8/31/23
Advanced Techniques in Cancer Imaging (Preceptor: 3/01/93-12/31/2011)
Advanced Techniques in Cancer Imaging (Program Director: 1/01/12-2/31/2013)
Stanford Cancer Imaging Training (SCIT) Program (Program Director: 3/01/13-2/28/2023)
 The goal of this project is to train radiologists and scientists to contribute to on-going development of cancer imaging techniques.

DoD W81XWH2010747 Partnering PI 9/01/20 – 8/31/23
Imaging and Exosomal Genomics as An Early Identifier of Lung Cancer
Goal: To evaluate the performance of [18F]FSPG PET/CT imaging in relation to exosomal genomics in discriminating between benign and malignant lung nodules.

NIH/NIBIB 75N92020C00008/75N92020C00021 co-I 8/21/20 – 4/30/23
NIH Prime: Univ of Chicago (Giger, M. PI)
Medical Imaging and Data Resource Center (MIDRC) for Rapid Response to COVID-19 Pandemic
Goal: To share COVID-19 image and related data and, with these, to spur development and implementation of new diagnostics, including machine learning algorithms, that will empower population-wide preventive and management strategies for COVID-19.

SPO 124869 ROYAL PHILIPS co-PI 9/01/16 – 8/31/22
Advancing Precision Health: Enabling Personalized Diagnostics and Treatment Delivery
Goal: To develop new care paradigms generally at the intersection of advanced clinical monitoring/imaging, novel diagnostic mechanisms, and predictive/prescriptive analytics.

NIH/NCI co-Investigator 5/01/21 – 4/30/26
Multiscale modeling of Glioma for the Prediction of Treatment response, Treatment Monitoring and Treatment Allocation
PI: Gevaert
Goal: To employ AI and radiogenomics techniques for management of patients with glioma.

NIH/NCI R01 CA233578-01 co-Investigator 2/1/19 – 1/31/24
Imaging and circulating DNA markers to assess early response and predict treatment failure patterns in lung cancer
Goal: To develop associations linking imaging phenotypes and circulating tumor cells to predict treatment failures in lung cancer.

NIH/NCI R01 CA222512-01 co-Investigator 2/1/18 – 1/31/24
Multiregional imaging phenotypes and molecular correlates of aggressive versus indolent breast cancer
Goal: To develop associations linking imaging phenotypes to molecular subtypes with different prognoses.

NIH/NCI R01 DE030894 co-Investigator 7/5/22 – 3/31/27
Precision imaging for risk stratification and personalized therapy of oropharyngeal cancer
Goal: To develop imaging-based prognostic models to improve risk stratification and guide personalized therapy of OPC.

Grants—Completed

1. Medical Research Council of Canada
Visiting Scientist Award 1988-90

2. Natural Sciences and Engineering Research Council of Canada
Visiting Industrial Fellowship 1989-90
1990-91
3. Stanford University Office of Technology Licensing
Multimodality Image Fusion for Stereotaxic Surgical Treatment of Brain Tumors
Principal Investigator 1992-93
4. Whitaker Foundation
Multimodality Image Fusion for Stereotaxic Surgical Treatment of Brain Tumors
Principal Investigator 1993-96
5. Department of Veterans Affairs
Skeletal Changes After Spinal Cord Injury and Cast Immobilization
Co-investigator 1994-96
6. Society of Gastroenterology Research Award
Three-dimensional CT Virtual Colonoscopy
Co-investigator 1995-96
7. National Institutes of Health: 1R01 NS33926-01
Evaluation of Retrospective Image Registration
Co-investigator, Collaboration with Vanderbilt University
8. National Institutes of Health: 1R01 HL50305-01
Three Dimensional CT Angiography
Principal Investigator 1995-98
9. National Institutes of Health: R01 HL46347-04
Noninvasive Myocardial Motion Analysis using Magnetic Resonance Imaging
Co-Investigator 1996-99
10. Acuson Corporation
3D Ultrasound Project
Principal Investigator 1998-01
11. National Institutes of Health: 1P20GM064782-01
Planning the Stanford Center for Biocomputation
Co-Investigator 2001-04
12. National Institutes of Health: 1T32GM063495-01
Predoctoral Graduate Training in Bioinformatics and Computational Biology
Preceptor 2001-04
13. Stanford BIO-X Interdisciplinary Initiative
Imaging and Learning Techniques for the Detection of Anomalous Structures in
3D Medical Images
Co-Investigator 2000-2003
14. National Institutes of Health
Volumetric Analysis of the Aorta and Its Branches
Co-Investigator 1999-2003
15. National Institutes of Health
Center for Advanced MR Technology at Stanford
Investigator 2000-2005
16. National Institutes of Health: RO1 R01CA66785

- Magnetic Resonance Imaging of Breast Cancer
Co-Investigator 2005-2005
17. R2 Technology, Inc.
Computer Aided Tracking and Analysis of Pulmonary Nodules Over Time
Principal Investigator 2003-2005
 18. NIH/NHLBI RO1 HL67194
Efficient Interpretation of 3D Vascular Image Data
Principal Investigator 2001-2006
 19. NIH/NIBIB RO1 EB003524
Improved C-Arm CT for Interventional Procedures
Co-Investigator 2004-2007
 20. Siemens Medical Solutions
Interventional Room of the Future
Co-Investigator 2002-2006
 21. NSF ACI-205741
Simulation-Based Medical Planning for Cardiovascular Disease
Co-Investigator 2002-2007
 22. NIH/NCI R01 CA72023
Three-Dimensional Spiral CT Colonography
Co-Principal Investigator 1996-2009
 23. NIH 1 U54 GM072970-01
Physics-based Simulation of Biological Structures
Co-Investigator 2004-2009
 24. BIO-X Interdisciplinary Initiatives Program #3
A Novel Transducer Array and Intelligent Software for Automated Detection of
Asymptomatic Carotid Artery Stenosis
Principal Investigator 2006-2009
 25. NIH/SBIR 1R43RR02802001A1
Automated Bone Removal for Head and Neck CTA using Dual Energy CT
Stanford Principal Investigator 2009-2010
 26. NSF CNS-0619926
MRI: Acquisition of a Hybrid Shared-Memory / Massively-Parallel Commodity
Cluster for Cost-Effective Super-Computing at Stanford.
Investigator 2006-2011
 27. NIH R01 CA109089
Improving Radiologist Detection of Lung Nodules with CAD
Co-Principal Investigator 2005-2010
Principal Investigator 2010-2011
 28. NIH/R01 CA134720
Co-Investigator 2009-2013
Miniaturized Real-Time Volumetric Ultrasound Imaging System
 29. NIH/NCI U01CA142555
Co-Investigator 2010-2016
Computerized Quantitative Imaging Assessment of Tumor Burden
 30. NIH/NIBIB R01 EB014955

- subcontract PI (Kitware, Inc.) 2013-2017
Accelerating Community-Driven Medical Innovation with VTK
31. NIH/NCI R01 CA160251-01
Principal Investigator 2011-2017
Tools for Linking and Mining Image and Genomic Data in Non-Small Cell Lung Cancer
 32. NIH/NCI R01 EB020527
co-Investigator 2/15/15 – 1/31/19
Radiogenomics Framework for Non-Invasive Personalized Medicine
 33. NIH/NCI U24 CA180927 (MGH prime)
Site Principal Investigator 9/01/14 – 08/31/19
Informatics Tools for Optimized Imaging Biomarkers for Cancer Research & Discovery
 34. NIH/NCI U01 CA196405
Site Principal Investigator 9/1/16 – 8/31/19 (NCX)
Radiomics and Deep Learning Approaches for Screen Detected Adenocarcinoma
 35. NIH R01 EB020527
Co-Investigator 2/15/15 - 01/31/20
Radiogenomics Framework for Non-Invasive Personalized Medicine
 36. NIH/NCI U01 CA187947-A1
Principal Investigator 9/01/15 – 8/31/20
Computing, Optimizing, and Evaluating Quantitative Cancer Imaging Biomarkers
 37. Stanford AIMI Center Seed Grant
co-PI 8/16/19 – 08/15/20
Machine Learning for Distinguishing Non-small Cell Cancer from Small-cell Cancer from Benign Pulmonary Nodules on Chest CT in a Multi-Center VA Cohort.
 38. NIH/NCI U01 CA190214
co-Investigator 6/01/15 – 5/31/21
Qualification and Deployment of Imaging Biomarkers of Cancer Treatment Response

U.S. Patents

1. S.M-H. Song, S.A. Napel and N.J. Pelc: Flow measurement of incompressible fluid using divergence free constraint. (5,309,100) issued 5/3/1994.
2. T.S. Sumanaweera, S. Napel, G.H. Glover, and J.R. Adler: Method for correcting magnetic field inhomogeneity distortion in MRI images having disconnected regions (5,485,085) issued 1/16/1996.
3. C.H. Yan, R.T. Whalen, S. Napel: Method for Beam Hardening Correction in Quantitative Computed X-ray Tomography (6,324,240) issued 11/27/2001.
4. S. Shiffman, S. Napel: Object Segregation in Images (6,424,732) issued 6/23/2002.
5. J. A. Hossack, T. S. Sumanaweera, A. He, S. Napel, R. B. Jeffrey, Jr., D. Paik: Medical Diagnostic Ultrasound System and Method for Flow Analysis (6,503,202) issued 1/7/2003.
6. D.S. Paik, G.D. Rubin, C.F. Beaulieu, S. Napel, R.B. Jeffrey Jr.: Method For Detecting Shapes In Medical Images, (7,043,064), issued 5/9/2006.

7. D.S. Paik, S. Napel, G.D. Rubin, C.F. Beaulieu: Method For Characterizing Shapes In Medical Images (7,043,064 - Amendment), issued 5/9/2006.
8. R. Raman, S. Napel, G.D. Rubin: Curved Slab Maximum Intensity Projections, (7,170,517), issued 1/30/2007.
9. B. Acar, C.F. Beaulieu, S. Napel, R.B. Jeffrey, Jr., D.S. Paik: Method for Matching and Registering Medical Image Data (7,224,827), issued 5/29/2007.
10. B. Acar, C.F. Beaulieu, S. Napel, R.B. Jeffrey, Jr., D.S. Paik, S.B. Gokturk, C. Tomasi: Method for Detecting and Classifying a Structure of Interest in Medical Images, (7,272,251), issued 9/18/2007.
11. R. Raman, S. Napel, G.D. Rubin: Quantification of Aortoiliac Endoluminal Irregularity, (7,324,675), 1/29/2008.
12. R. Raman, B. Raman, S. Napel, G.D. Rubin: Quantification Method of Vessel Calcification (7,330,576), issued 2/12/2008.
13. S. B. Gokturk, C. Tomasi, B. Acar, C.F. Beaulieu, S. Napel, D. S. Paik: Three-Dimensional Pattern Recognition Method to Detect Shapes in Medical Images, (7,346,209), issued 3/18/2008.
14. R. Raman, S. Napel, G.D. Rubin: Quantification of Vascular Irregularity, (7,379,574), issued 5/27/2008.
15. R. Raman, S. Napel, G.D. Rubin: Curved Slab Maximum Intensity Projections, (7,471,814), issued 12/30/2008.
16. D.S. Paik, P. Sundaram, C.F. Beaulieu, S. Napel: Polyp Identification Through Subtraction of Models of Medical Images, (7,616,800) Issued 11/10/2009.
17. S. Sun, S. Napel: Registration System and Method for Tracking Lung Nodules in Medical Images, (7,657,073) issued 2/2/2010.
18. B. Acar, E. Konukoglu, C. F. Beaulieu, S. Napel, D. S. Paik: Heat Diffusion Based Detection of Structures Of Interest In Medical Images, (7,729, 739) issued 6/1/2010.
19. D. W. Lau, V. Yeluri, J. Hellinger, D. S. Paik, S. Napel, T. Gentles. "System and Method for Linking Current and Previous Images Based on Anatomy," (7,747,050) issued 6/29/2010.
20. S. Sun, F. Zhuge, S. Napel: Learning-Enhanced Simulated Annealing, (7,840,504) issued 11/23/2010.
21. P. Sundaram, A. Zomorodian, C. F. Beaulieu, S. Napel: Polyp Detection Using Smoothed Shape Operators," (8,055,047) issued 11/8/2011.
22. M. Kukuk, S. Napel: "System For Three-Dimensional Medical Instrument Navigation," (8,073,221) issued 12/6/2011.
23. M. Kukuk, S. Napel: "Rotational stereo roadmapping," (8,233,962) issued 7/31/2012.
24. M. Kukuk, S. Napel: "Apparatus and Method for Aligning a Light Pointer With a Medical Interventional Device Trajectory," (8,265,731) issued 9/11/2012.
25. E. J. Alexander, T. P. Andriacchi, P. Lang, S. A. Napel: Assessing the condition of a joint and preventing damage (8,265,730) issued 9/11/2012.
26. E. J. Alexander, T. P. Andriacchi, P. Lang, S. A. Napel: Assessing the condition of a joint and preventing damage (8,862,202) issued 10/14/2014.

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258. J. S. Faruque, D. L. Rubin, C. F. Beaulieu, A. Kamaya, G. A. Tye, S. Napel, et al. "A Scalable Reference Standard for Perceptual Similarity of CT Liver Lesions using Matrix Completion Techniques," Radiological Society of North America 97th Scientific Sessions, November 2011.
259. J. Xu, H. Greenspan, S. Napel, D. L. Rubin, "Automated Temporal Tracking And Segmentation Of Lymphoma On Serial CT Examinations," Radiological Society of North America 97th Scientific Sessions, November 2011.
260. J. Xu, J. S. Faruque, C. F. Beaulieu, D. L. Rubin, S. Napel, "A Comprehensive Descriptor of Shape: Method and Application to Retrieval of Similar Appearing Lesions in Medical Images," Radiological Society of North America 97th Scientific Sessions, November 2011.

261. F. J. Gimenez, J. Xu, T. Liu, C. F. Beaulieu, D. L. Rubin, S. Napel, et al. "Prediction of radiologist observations using computational image features: Method and Preliminary Results," Radiological Society of North America 97th Scientific Sessions, November 2011.
262. O. Gevaert, L. A. Mitchell, J. Xu, C. Yu, D. L. Rubin, G. Zaharchuk, S. Napel, S. K. Plevritis, "Radiogenomic analysis indicates MR images are potentially predictive of EGFR mutation status in glioblastoma multiforme," Association of Cancer Research, Chicago, March 2012.
263. V. S. Nair, O. Gevaert, G. Davidzon, S. Napel, E. Graves, C. D. Hoang, A. Quon, D. L. Rubin, S. K. Plevritis, "Non-small Cell Lung Cancer Tumor ¹⁸F-FDG Uptake is Associated with Gene Dysregulation Beyond Glycolysis," American Thoracic Society, San Francisco, May 2012.
264. X. Wang, A. N. C. Leung, I. Chan, S. K. Plevritis, C. D. Hoang, D. L. Rubin, S. Napel, "A 3D multiple-layer region-growing algorithm for automated 3D segmentation of pulmonary tumors seen on volumetric CT scans," Radiological Society of North America 98th Scientific Sessions, November 2012.
265. J. S. Faruque, D. L. Rubin, C. F. Beaulieu, J. Rosenberg, S. Napel, "A Statistical Model for Predicting Sample Size for Radiologists' Perception of Similarity in Liver Lesions," Radiological Society of North America 98th Scientific Sessions, November 2012.
266. K. Roychoudhury, M. Tall, S. Napel, S. Bag, B. Harrawood, J. Roos, G. D. Rubin, "Analysis of the detection of lung nodules in volumetric CT data by radiology residents using gaze tracking," Radiological Society of North America 98th Scientific Sessions, November 2012.
267. B. R. Shah, J. Xu, B. H. Do, D. L. Rubin, S. Napel, C. F. Beaulieu, "Quantitative Analysis of Focal Bone Tumors on Radiography: Initial Experience Comparing Lucent and Sclerotic Lesions," Radiological Society of North America 98th Scientific Sessions, November 2012.
268. V. T. Tran, D. Weinreb, A. Quon, S. Napel, H. E. Daldrup-Link, "Fusion PET-MR: Correlation Of Contrast Enhancement And 18-FDG-PET Activity For The Development Of An Integrated Scanning Protocol," Annual Meeting of the Society for Pediatric Radiology. *Pediatric Radiology* 43, Suppl. 1, 2013.
269. O. Gevaert, L. Mitchell, J. Xu, S. Napel, G. Zaharchuk, S.K. Plevritis, "Creating a radiogenomics map of multi-omics and quantitative image features in glioblastoma multiforme," Radiological Society of North America 99th Scientific Sessions, December 2013.
270. C. Klenk, V. T. Tran, R. Gawande, S. Napel, A. Quon, H. E. Daldrup-Link, "Correlation of 18F FDG activity and Gd-contrast enhancement of pediatric tumors on PET/MR: The next step towards "one stop shop" tumor staging," Radiological Society of North America 99th Scientific Sessions, December 2013.
271. J. Kalpathy-Cramer, B. Zhao, D. Goldgof, Y. Gu, X. Wang, S. Napel, "A platform for the comparison of lung nodule segmentation algorithms: methods and preliminary results," Radiological Society of North America 99th Scientific Sessions, December 2013.

272. A. Kamaya, S. Vossler, Y. I. Liu, S. Napel, S. Plevritis, A. Holzer, N. Kothary, "Prediction of microvascular invasion in hepatocellular carcinoma," Society of Abdominal Radiology, Boca Raton FL, 2014.
273. H. Itakura, A. S. Achrol, J. J. Loya, L. A. Mitchell, T. D. Azad, S. Echegaray, K. Yeom, S. Napel, G. R. Harsh IV, O. Gevaert, "Glioblastoma Subtypes Defined By Quantitative Imaging Map To Different Canonical Signaling Pathways," 11th Congress of the European Association of Neuro-Oncology, Turin, Italy, Oct. 2014.
274. H. Itakura, A. S. Achrol, J. J. Loya, L. A. Mitchell, T. D. Azad, S. Echegaray, K. Yeom, S. Napel, G. R. Harsh IV, O. Gevaert, "Identification and validation of glioblastoma subtypes using quantitative imaging that map to canonical signaling pathways," Society of Neuro-Oncology Annual Meeting, Miami, FL, Nov. 2014.
275. H. Itakura¹, A. S. Achrol, T. T. Liu, S. Echegaray, J. J. Loya, A. Feroze, L. A. Mitchell, S. Rodriguez, E. Westbroek S. Cheshier, G. Steinberg, D. Rubin, K. Yeom, S. Napel, G. R. Harsh IV, O. Gevaert, "Development and validation of a quantitative image signature that predicts clinical survival in glioblastoma," Radiological Society of North America 100th Scientific Sessions, December 2014.
276. G. D. Rubin, B. Harrawood, S. Napel, J. E. Roos, K. R. Choudhury, "The Moment of Recognition: Method and Analysis of Gaze Behavior in the Search for Lung Nodules in CT Scans," Radiological Society of North America 101st Scientific Sessions, December 2015.
277. O. Gevaert, S. Echegaray, A. Khuong, C. D. Hoang, J. B. Shrager, S. K. Plevritis, S. Napel, A. N. Leung, "Predictive modeling of epidermal growth factor receptor mutation status using semantic image features in non-small cell lung cancer (NSCLC)," Radiological Society of North America 101st Scientific Sessions, December 2015.
278. O. Gevaert, S. Echegaray, S. Napel, N. Kothary, "Predictive modeling of microvascular invasion using triphasic quantitative imaging of hepatocellular carcinoma (HCC)," Radiological Society of North America 101st Scientific Sessions, December 2015.
279. O. Gevaert, S. Napel, S. Echegaray, A. Khuong, C. D. Hoang, J. B. Shrager, S. K. Plevritis, A. N. Leung, "Radiogenomics mapping of non-small cell lung cancer (NSCLC) identifies prognostic relationships between semantic image features and metagenes captured using RNA sequencing," Radiological Society of North America 101st Scientific Sessions, December 2015.
280. V.S. Nair, A. Garcia, H. Chen, Y. Balagurunathan, T. Atwater, O. Gevaert, S. Antic, M. Schabath, S. Napel, R. Walker, R. Gillies, P. P. Massion, "Validating a radiomic classifier for improved lung cancer prediction of indeterminate pulmonary nodules," American Thoracic Society Annual Meeting, May 2016, San Francisco.
281. M. Zhou, S. Napel, S. Echegaray, A. N. Leung, O. Gevaert, "Radiogenomics Mapping of Non-small Cell Lung Cancer Shows Strong Correlations between Semantic Image Features and Metagenes," Radiological Society of North America 102st Scientific Sessions, December 2016.
282. C. Letrong, V. Hinostroza, S. Walters, S. Napel, R. Bammer, D. Fleischmann, "The Essential Guide to Starting a Clinical 3DP Program," Radiological Society of North America 102nd Scientific Sessions, December 2016.

283. K. Roychoudhury, B. Harrawood, J. E. Roos, S. Napel, G. D. Rubin, "Multivariate modelling of nodule recognition in 3-d chest CT using gaze tracking," Radiological Society of North America 102nd Scientific Sessions, December 2016.
284. S. Napel, S. Echegaray, D. Gude, O. Gevaert, D. L. Rubin, "The Quantitative Image Feature Pipeline (QIFP) for Discovery, Validation, and Translation of Cancer Imaging Biomarkers," Radiological Society of North America 102nd Scientific Sessions, December 2016.
285. W. Zhang, G. Bouchard, A. Yu, M. Shafiq, M. Jamali, J. Shrager, K. Ayers, V. S. Nair, A. Gentles, M. Diehn, A. Quon, S. Napel, S. K. Plevritis, "FDG uptake in human lung adenocarcinoma associated with invasion through the hexosamine biosynthesis pathway, AACR Annual Meeting, Washington D.C., April 2017.
286. C. Letrong, V. Hinostroza, S. Walters, S. Napel, D. Fleischmann, "Interventional 3D Printing Case Studies," Mayo Clinic 3D Printing Conference, January 2017.
287. C. Letrong, V. Hinostroza, S. Walters, S. Napel, D. Fleischmann, "3D Printing in Mitral Valve Intervention Case Studies," Mayo Clinic 3D Printing Conference, January 2017.
288. M. Shafiq, W. Zhang, A. Gentles, K. Ayers, V.S. Nair, J. Shrager, C. Hoang, O. Gevaert, S. Napel, S. Plevritis, "Using Tissue Gene Expression to Predict Survival Following 'Curative' Surgical Resection in Lung Adenocarcinoma, American Thoracic Society Annual Meeting, Washington D.C., May 19-24, 2017.
289. S. Napel, D. L. Rubin, S. John, D. Gude, S. Echegaray, S. Bakr, S. Mattonen, "The Quantitative Image Feature Pipeline (QIFP): Automated Radiomic Feature Extraction to Derive Associations with and Prediction of Clinical Variables from Image Features," Radiological Society of North America 103rd Scientific Sessions, December 2017.
290. J. Kalpathy-Cramer, B. Zhao, D. Goldgof, S. Napel, D. L. Rubin, M. F. McNitt-Gray, et al, "Standardizing Radiomic Feature Descriptions for Quantitative Imaging: A Preliminary Report of the Cooperative Efforts of the NCI's QIN PET-CT Subgroup," Radiological Society of North America 103rd Scientific Sessions, December 2017.
291. S. Bakr, S. Mattonen, A.L. Garcia, S. Antic, Y. Balagurunathan, T. Atwater, H. Chen, O. Gevaert, R. Walker, M. Schabath, R. Gillies, P. Massion, V. Nair, S. Napel, "A Size-independent Radiomics Model for Classification of Indeterminate Pulmonary Nodules Seen at CT," Radiological Society of North America 103rd Scientific Sessions, December 2017.
292. S. Mattonen, S. Bakr, G. A. Davidzon, V. S. Nair, S. Napel, "Positron Emission Tomography (PET) Tumor Penumbra Radiomics For Prediction of Survival in Non-Small-Cell Lung Cancer: A Pilot Study," Radiological Society of North America 103rd Scientific Sessions, December 2017.
293. V. Hinostroza, C. Letrong, L. Molvin, S. Walters, S. Napel, D. Fleischmann, "Protocoling Imaging Studies with 3D Prints in Mind," Radiological Society of North America 103rd Scientific Sessions, December 2017.
294. C. Letrong, S. Walters, D. Liang, S. Napel, D. Fleischmann, "3D Printing for Treatment Planning: Transseptal Mitral Valve Replacement Case Studies," Radiological Society of North America 103rd Scientific Sessions, December 2017.

295. E. H. Lee, M. Zhou, N. Gamboa, K. Brennan, H. Itakura, V. Nair, S. Napel, S. Wong, O. Gevaert, "Deep learning to predict survival prognosis for patients with non-small cell lung cancer using images and clinical data," Amer Assoc Cancer Research Annual Meeting, Chicago, Il., April 2018.
296. S. A. Mattonen, G. A. Davidzon, S. Bakr, M. Vasanaawala, G. Horng, S. Napel, V. S. Nair, "Positron Emission Tomography (PET) Tumor Penumbra Imaging Features Predict Outcome in Non-Small Cell Lung Cancer," American Thoracic Society Annual Meeting, San Diego, CA, May 18-23, 2018.
297. S. John, D. Rubin, D. Gude, S. Echegaray, S. Bakr, S. Mattonen, S. Napel, "QIFP : A web application to support quantitative imaging pipelines on medical images," SIIM Conference on Machine Intelligence in Medical Imaging, San Francisco, September 2018.
298. S. Napel, D. L Rubin, S. John, D. Gude, S. Echegaray, S. Mattonen, S. Bakr, "The Quantitative Image Feature Pipeline (QIFP): Automated Computation of Quantitative Image Features and Construction of Predictive Models, Radiological Society of North America 104th Scientific Sessions, December 2018.
299. S. Mattonen, G. A. Davidzon, S. Bakr, S. Echegaray, A. N. C. Leung, M. Vasanaawala, G. Horng, V. S. Nair, S. Napel, "18F FDG Positron Emission Tomography (PET) Tumor Penumbra Texture Predicts Recurrence in Non-Small Cell Lung Cancer," Radiological Society of North America 104th Scientific Sessions, December 2018.
300. J. Wu, X. Li, X. Teng, D. L. Rubin, S. Napel, B. Daniel, R. Li, "Quantitative DCE-MRI features can complement molecular markers for predicting tumor infiltrating lymphocytes in breast cancer: model discovery and independent validation," Radiological Society of North America 104th Scientific Sessions, December 2018.
301. K. Gifford, C. Letrong, V. Hinostroza, R. Fan, S. Napel, D. Fleischmann, "Enhancing Understanding of Pathology with 3D Printed Prostate Cutting Guides," Radiological Society of North America 104th Scientific Sessions, December 2018.
302. S. A. Mattonen, G. A. Davidzon, J. Benson, A. N. C. Leung, M. Vasanaawala, G. Horng, J. B. Shrager, S. Napel, V. S. Nair, "Integrated Bone Marrow and Tumor Radiomics on [18F] FDG Positron Emission Tomography (PET) Augment Stage for Outcome Prediction in Non-Small Cell Lung Cancer," American Thoracic Society Annual Meeting, Dallas, TX, May 15-20, 2019.
303. M. McNitt-Gray, S. Napel, J. Kalpathy-Cramer, A. Jaggi, D. Cherezov, D. Goldgof, H. Yang, E. Jones, M. Muzi, N. Emaminejad, M. Wahi-Anwar, Y. Balagurunathan, M. Abdalah, B. Zhao, L. Hadjyiski, L. Pierce, K. Farahani, "Standardization in Quantitative Imaging: A Comparison of Radiomics Feature Values Obtained by Different Software Packages On a Set of Digital Reference Objects, AAPM Annual Meeting July 14-18 2019, San Antonio, Tx.
304. P. Mukherjee, A. Brezhneva, S. Napel, O. Gevaert, "Detection of Lung Cancer in subjects with positive screening CT scans in the National Lung Screening Trial (NLST) dataset by leveraging the Lung Image Database Consortium (LIDC-IDRI) dataset," Radiological Society of North America 105th Scientific Sessions, December 2019.

305. S. Napel, D. Gude, T. L. Casavant, D. Cherezov, S. A. Mattonen, D. L. Rubin, "The Quantitative Image Feature Pipeline (QIFP): Automated Computation of Quantitative Image Features for Prediction of Clinical Characteristics (e.g., Malignancy, Response to Therapy, Overall Survival) in Subject Cohorts," Radiological Society of North America 105th Scientific Sessions, December 2019.
306. M. F. McNitt-Gray, S. Napel, J. Kalpathy-Cramer, A. Jaggi; N. Emaminejad, M. Muzi, D. Cherezov, D. Goldgof, H. Yang, E. Jones, M. Wahi-Anwar, Y. Balagurunathan, M. Abdalah, B. Zhao, L. Hadjiiski, A. Virkid, H-P Chan, L. Pierce, K. Farahani, "Standardization in Quantitative Imaging: A Multi-center Comparison of Radiomics Feature Values Obtained by Different Software Packages on Digital Reference Objects and Patient Datasets," Radiological Society of North America 105th Scientific Sessions, December 2019.
307. C. LeCastillo, K. Gifford, E. Jablonka, D. Nguyen, G. Lee, S. Walters, S. Napel, D. Fleischmann, "3D Printing for Breast Reconstruction," *accepted to RSNA Medical 3D Printing in Practice Course, March 6 – 8, 2020, Westin Michigan Avenue, Westin Michigan Avenue, Chicago, IL.*
308. D. Mastrodicasa, S. Mattonen, S. T. Chang, G. Charville, E. Olcott, R. B. Jeffrey, Jr., S. Napel, B. Patel, "Machine-Learning Based CT Radiomics Model to Predict Survival in Patients with Pancreatic Ductal Adenocarcinoma. Radiological Society of North America 106^h Scientific Sessions, December 2020.
309. A. B. Mantz, R. Zhou, A. Kozlov, W. DeMartini, S-T. Chen, S. Okamoto, D. M. Ikeda, S. A. Mattonen, S. Napel, E. Alkim, G. W. Sledge, A. W. Kurian, M. Liu, M. L. Telli, Itakura, Haruka, "Radiomic features quantifying pixel-level characteristics of breast tumors from magnetic resonance imaging predict risk factors in triple-negative breast cancer." *Journal of Clinical Oncology* 40(16) supplement, June 1, 2022.

Invited Articles

1. G.D. Rubin, S. Napel, "Increased Scan Pitch for Vascular and Thoracic Spiral CT." *Letter to the Editor, Radiology*, **197**(1):316-7, 1995.
2. G.D. Rubin, S. Napel, A.N. Leung, "Volumetric Analysis of Volumetric Data—Achieving a Paradigm Shift," *Editorial, Radiology* **200**(2)312-317, 1996.
3. M.L. Davila, C.F. Beaulieu, D.S. Paik, S. Napel, P.S. Edelstein, R.B. Jeffrey, Jr., "CT and MR Colonography (Virtual Colonoscopy)," *Techniques in Gastrointestinal Endoscopy*, **2**:30-36, 2000.
4. D. S. Katz, N. Venkataramanan, S. Napel. F.G. Sommer, "Low Dose Unenhanced Multidetector Helical CT for the Evaluation of Suspected Renal Colic: Can it be Routinely Utilized?" *American Journal of Roentgenology* **180**:313-315, 2003.
5. C. L. Partain, H-P Chan, J. G. Gelovani, M. L. Giger, J. A. Izatt, F. A. Jolesz, K. Kandarpa, K. C. P. Li, M. McNitt-Gray, S. Napel, R. M. Summers, and G. S. Gazelle, "Biomedical Imaging Research Opportunities Workshop II: Report and Recommendations," *Radiology* **236**: 389-403, 2005.
6. P. Sundaram, D.S. Paik, C.F. Beaulieu, S. Napel, "Algorithmic Colon Polyp Detection: Image Processing or Geometry Processing?" *Proc MICCAI Workshop:*

Computational and Visualization Challenges in the New Era of Virtual Colonoscopy, 2008.

7. S. Napel and M. L. Giger, "Radiomics and Imaging Genomics: Quantitative Imaging for Precision Medicine," Editorial written for Special Section on Radiomics and Imaging Genomics, SPIE Journal of Medical Imaging, December 2015. PMID: 26839908; PMCID: PMC4729214.
8. I. El Naqa, S. Napel, "Radiogenomics is the future of treatment response assessment in clinical oncology," Med Phys. 2018 Oct;45(10):4325-4328. PMID: 29863785.

Invited Presentations

1. S. Napel, "Cine Computed Tomography." IEEE Computer Society—Computer Elements Workshop. Mesa, Arizona, November 1987.
2. S. Napel, "Comparison of 3-D Results by CT and Arteriography in the Same Patient." Symposium on Coronary Artery Calcification — Detection, Quantitation and Prognostic Significance. Miami Beach, Florida, February 1989.
3. S. Napel, "Ultrafast Computed Tomography." Robarts Research Institute, London, Ontario, May 1989.
4. S. Napel, M.P. Marks, G.D. Rubin, M.D. Dake, D.R. Enzmann, C.J. Bergin, D.V. Paranjpe, R.B. Jeffrey, Jr., "CT Angiography Using Continuous Volume CT Scanning with Maximum Intensity Projections for 3D Visualization." Advances in Ultrafast CT, Burlingame, CA, October, 1992
5. S. Napel, "Time Sequence of Flow Information via 3DPC Simulated Streamlines," University of Michigan, Magnetic Resonance Angiography Course and Workshop. Lansing, Michigan, October 14 - 18, 1992.
6. S.A. Napel, M.P. Marks, G.D. Rubin, M.D. Dake, D.R. Enzmann, D.V. Paranjpe, R.B. Jeffrey, Jr., "Three-dimensional CT Angiography Using Spiral CT in the Brain, Neck, Chest, and Abdomen." Cardiovascular Science and Technology Conference (AAMI), Hyatt Regency Bethesda, December 12-14, 1992.
7. S. Napel, "Three-dimensional Vascular Imaging with CT and MR." Hemodynamics and Atherosclerosis Symposium, Stanford University, July, 1993.
8. S. Napel, "CT Angiography: An Update." Advances in Ultrafast CT: 1993 Electron Beam Tomography (EBT) International Symposium, sponsored by the University of Iowa in conjunction with the Harbor-UCLA Medical Center, Miami, Florida, October 8-10, 1993.
9. S. Napel, "MR Physics of Blood Flow." Diagnostic Imaging Update: CT, MR, Chest and Interventional, hosted by Stanford University, Maui, Hawaii, February 21-25, 1994.
10. S. Napel, "3D Image Reconstruction Techniques in CT and MR." Diagnostic Imaging Update: CT, MR, Chest and Interventional, hosted by Stanford University, Maui, Hawaii, February 21-25, 1994.

11. S. Napel, "Technical Considerations in Spiral CT." Diagnostic Imaging Update: CT, MR, Chest and Interventional, hosted by Stanford University, Maui, Hawaii, February 21-25, 1994.
12. S. Napel, "CT for Evaluation of Vascular Disease - How and Why." Vascular Disease 1994: Diagnosis and Treatment postgraduate course, hosted by Stanford University, Monterey, California, October 26-30, 1994.
13. S. Napel, "Fast CT: Is it Different?" American Association of Physicists in Medicine Symposium, Radiological Society of North America, Chicago, IL, November 26 - December 2, 1994.
14. S. Napel, "Computer Technology." Discussion Leader. Virtual Colonoscopy Workshop, National Institutes of Health, National Cancer Institute, Bethesda, MD, June 12, 1995.
15. S. Napel, "CT Image Reconstruction." American Association of Physicists in Medicine Summer School: CT and US Technology and Applications, New London, CT, June 25-29, 1995.
16. S. Napel, "Image Processing and 3D Displays." American Association of Physicists in Medicine Summer School: CT and US Technology and Applications, New London, CT, June 25-29, 1995.
17. S. Napel, "Computed Tomography and Magnetic Resonance Image Fusion for Stereotaxic Treatment of Brain Tumors." The Whitaker Foundation, Snowbird, Utah, August 4-6, 1995.
18. S. Napel, "Virtual Endoscopy and More." Advances in Ultrafast CT 1995: An International Symposium on Electron Beam Tomography, Scottsdale, Arizona, October, 1995.
19. S. Napel, "Virtual Endoscopy," Rapid Prototyping in Medicine and Computer Assisted Surgery, Erlangen, Germany, October 19-21, 1995.
20. S. Napel, G.D. Rubin, C.F. Beaulieu, R.B. Jeffrey, Jr., "Evaluation of Cross-sectional Medical Images using Perspective Rendering — Virtual Endoscopy." Imatron Japan EBCT Symposium, Yokohama, Japan, January 26-27, 1996.
21. S. Napel, Virtual Colonoscopy Workshop (*Follow-up of June 12, 1995 workshop to discuss feasibility of Virtual Colonoscopy for Clinical Application*), National Institutes of Health, National Cancer Institute, Bethesda, MD, March 4, 1996.
21. S. Napel, "3-D CT Imaging for Simulated Endoscopy and Intra-parenchymal Viewing." American Association of Physicists in Medicine Annual Meeting, Philadelphia, July 21-25, 1996.
23. S. Napel, Virtual Colonoscopy Workshop (*Follow-up of June 12, 1995 and March 4, 1996 workshops to discuss feasibility of Virtual Colonoscopy for Clinical Application*), National Institutes of Health, National Cancer Institute, Bethesda, MD, September 13, 1996.
24. S. Napel, "Virtual Reality: Emerging Technology for Diagnosis," College of American Pathologists, San Diego, CA, October 3, 1996.
25. S. Napel, Virtual Endoscopy Panel, MEDTEC 1997, Tysons Corner, VA, August 14-17, 1997.

26. S. Napel, "Virtual Endoscopy: Overview and Recent Developments," Rapid Prototyping in Medicine and Computer Assisted Surgery, Erlangen, Germany, October 16-18, 1997.
27. S. Napel, "Diagnostic Radiology in Three Dimensions: Present and Future," University of Chicago, Radiology Grand Rounds, September 1998.
28. S. Napel, "New Visualization Techniques for Virtual Colonoscopy," 1st International Symposium on Virtual Colonoscopy, Boston, October 1998.
29. S. Napel, "Current State of the Art EBCT 3D Imaging," Advances in Electron Beam Computed Tomography: An International Scientific Symposium, San Francisco, October 16-18, 1998.
30. S. Napel, "Diagnostic Radiology in Three Dimensions," Medicine Meets Virtual Reality at Stanford, January 23, 1999.
31. S. Napel, "Volumetric Display and Analysis of Volume Data," Joint Working Group on Image-guided Diagnosis and Treatment, National Institutes of Health (NCI) and Office of Women's Health Workshop, Washington D.C., April 12-14, 1999.
32. S. Napel, "Volumetric Imagery: Changing the Paradigm of Radiological Interpretation," University of Western Ontario, June 15, 1999.
33. S. Napel, "Volumetric Visualization of Medical Imagery: A New Paradigm for Radiology," Symposium on Visualization in Medicine, American Association of Physicists in Medicine Annual Meeting, Nashville, July 25-29, 1999.
34. S. Napel, "3D Diagnostic Radiology: Present Status and Future Direction," Rapid Prototyping in Medicine and Computer Assisted Surgery, Erlangen, Germany, October 14-16, 1999.
35. S. Napel, "Multidetector CT," Radiology Grand Rounds, November 22, 1999.
36. S. Napel, "Display and Analysis of Volumetric Medical Imagery: Towards a New Paradigm for Radiological Interpretation," Progress in Radiology Series, University of California, San Francisco, January 27, 2000.
37. S. Napel, "Computerized Detection of Polyps in CT Colonography," 14th Computer Assisted Radiology and Surgery, San Francisco, June 2000.
38. S. Napel, "Living with Thousands of Slices: Towards a New Paradigm for Radiological Interpretation," International Society for Strategic Studies in Radiology, San Francisco, August, 2001.
39. S. Napel, "Radiological Data Explosion: The Good, the Bad, and Surviving the Ugly," Rapid Prototyping in Medicine and Computer Assisted Surgery, Nurnberg, Germany, October 11-13, 2001.
40. S. Napel, G.D. Rubin, A.G. Sorensen, "Volumetric Visualization and Analysis: Introduction and Clinical Benefits," AAPM/RSNA Symposium, Arie Crown Theater, November 2002.
41. G.D. Rubin, E.K. Fishman, S. Napel, P.J. Pickhardt, "Three-dimensional Imaging: Where Are We Headed?" Special Focus Session, RSNA, November 2004.
42. S. Napel, "Linking Image features to diseases, molecular phenotypes and outcomes: methods and example in non-small cell lung cancer," S. Napel,

International Symposium on BIOMEDICAL IMAGING: From Nano to Macro, San Francisco, April 8, 2013.

43. S. Napel "Spotlight Talk on Radiogenomics," World Molecular Imaging Congress, Sept. 2014, Seoul, Korea.
44. S. Napel, "Oncogene Tumor Heterogeneity Translated to Imaging: Radiomics and Radiogenomics – Decoding Tumor Phenotype using Radiomics," World Molecular Imaging Congress, Honolulu, Hawaii, Sept. 2015.
45. S. Napel, "The Rise (and Fall?) of Radiomics," Radiomics 2016, Clearwater Beach, FL, October 2016.
46. S. Napel, "Decoding Tumor Phenotype using Radiomics: Methods, Challenges, and Potential," Annual Keck Seminar, Gulf Coast Consortium, Magnetic Resonance Radiogenomics Conference, Rice University, Houston, TX, March 31, 2017.
47. S. Napel, "Radiomics/Radiogenomics: Tools and Techniques," Imaging Network Ontario, Toronto, Ontario, March 28-29, 2018.
48. S. Napel, "Diagnostic and Predictive Radiomics: Methods, Challenges, and Outlook," University of Washington Dept. of Radiology Grand Rounds, January 11, 2019.
49. S. Napel, "Practical Radiomics and Radiogenomics Using Computational Pipelines," Society of Pediatric Radiology, San Francisco, May 3, 2019.
50. S. Napel, "Radiomics pipelines and the cancer data ecosystem," The Wizardry of Artificial Intelligence: AI and Machine Learning in Cancer Imaging, International Cancer Imaging Society, Champalimaud Foundation, Lisbon Portugal, May 17-18, 2019.
51. S. Napel, "Practical Radiomics and Radiogenomics Using Computational Pipelines," Plenary Session, International Conference on Advances in Radiomics, Tianjin Medical University Cancer Institute, Tianjin, China, Sept. 27-28, 2019.
52. S. Napel, "Practical Radiomics and Radiogenomics Using Computational Pipelines," University of Barcelona, Barcelona, Spain, January 21, 2020.

Books

1. Radiomics and Radiogenomics: Technical Basis and Clinical Applications, L. Xing, R. Li, S. Napel, D.L. Rubin, Editors, CRC Press, Boca Raton, Florida, 2019.

Book Chapters

2. S.G. Magistri, S.A. Napel, K.R. Peschmann, R.E. Rand, J.L. Couch, M.J. Lipton, D.P. Boyd, "Recent Technical Advances in Cine-Computed Tomography". In: New Developments in Imaging, R.Ch. Otto and C.B. Higgins, Editors, Thieme Medical Publishers, Inc., 1986.
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