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## Education and Training

Undergraduate	9/1970-6/1974	University of Wisconsin, Madison, B.S. (Applied Math Engineering and Physics)
Graduate	9/1974-6/1976	University of Wisconsin, Madison, M.S. (Radiological Sciences)
Graduate	7/1976-5/1982	University of Wisconsin, Madison, Ph.D. (Medical Physics)

## Certification and Licensure

1996	Diagnostic Radiologic Physics by the American Board of Radiology (ABR)
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## Academic and Administrative Appointments

### Academic Appointments:

<b>5/2012-pr</b>	<b>Professor of Biomedical Engineering (without tenure) University of Michigan</b>
<b>11/2001-pr</b>	<b>Adjunct Professor of Nuclear Engineering and Radiological Sciences University of Michigan</b>
<b>9/1999-pr</b>	<b>Professor of Radiological Sciences (with tenure) Department of Radiology University of Michigan</b>
9/1999-8/2009	Professor of Environmental and Industrial Health (without tenure) University of Michigan
1/1995-9/1999	Associate Professor of Environmental and Industrial Health University of Michigan
8/1992-9/1999	Associate Professor of Radiological Sciences Department of Radiology University of Michigan

7/1992-8/1992	Associate Professor of Radiology (Physics) University of Washington School of Medicine
7/1990-8/1992	Adjunct Assistant Professor of Bioengineering, University of Washington
9/1986-7/1992	Assistant Professor of Radiology (Physics), University of Washington School of Medicine
7/1982-8/1986	Instructor of Radiology, Harvard Medical School

**Administrative Appointments:**

<b>1996-pr</b>	<b>Associate Director for Clinical Radiological Physics, Radiological Sciences Division, Department of Radiology, University of Michigan</b>
1987-1992	Member of the Graduate Faculty of the University of Washington
1987-1992	Member of the Radiological Sciences Group of the University of Washington
1986-1992	Director, Diagnostic Physics, University of Washington Hospital, Department of Radiology
1982-1986	Assistant in Physics, Massachusetts General Hospital

**SCIENTIFIC ACTIVITIES**

**Editorial and Review Responsibilities:**

<b>2014-pr</b>	<b>Imaging Physics Editor of the Journal Medical Physics.</b>
<b>2017-pr</b>	<b>Journal of Medical Imaging (reviewer)</b>
<b>2004-2012</b>	<b>Associate Editor, Medical Physics</b>
<b>2010-pr</b>	<b>Pediatric Radiology (reviewer)</b>

<b>2004-pr</b>	<b>IOP Measurement Science and Technology (reviewer)</b>
<b>2003-pr</b>	<b>Physics in Medicine and Biology (reviewer)</b>
<b>2003-pr</b>	<b>Physica Medica European Journal of Medical Physics (reviewer)</b>
<b>2001-pr</b>	<b>IEEE Transactions on Information Technology in Biomedicine (reviewer)</b>
<b>2000-pr</b>	<b>Journal of Orthopaedic Research (reviewer)</b>
<b>2001-pr</b>	<b>Radiographics (reviewer)</b>
<b>1998-pr</b>	<b>Medical Physics (Guest Associate Editor)</b>
<b>1994-pr</b>	<b>Academic Radiology (reviewer)</b>
<b>1991-pr</b>	<b>Radiology (reviewer)</b>
<b>1989-pr</b>	<b>Medical Physics (reviewer)</b>
<b>1988-1992</b>	<b>Journal of Computer Assisted Tomography (reviewer)</b>
<b>1987-1994</b>	<b>Investigative Radiology (reviewer)</b>
<b>1987-1992</b>	<b>Journal of Clinical Ultrasound (reviewer)</b>

### **Special National and International Responsibilities:**

<b>2016-pr</b>	<b>Member of AAPM Review Article Subcommittee</b>
<b>2015-pr</b>	<b>Member of the National Mammography Quality Assurance Advisory Committee (NMQAAC) of the Food and Drug Administration (FDA). This is a permanent statutory committee established by the Mammography Quality Standards Act (MQSA)</b>
<b>2015-pr</b>	<b>Member of AAPM Scientific Integrity Subcommittee</b>

- 2015-pr**      **Member of Working Group 4 of Medical Physics Journal Editorial Board**  
(Improve the visibility of Medical Physics)
  
- 2015-pr**      **Member of AAPM Working Group on Optimization of Medical Imaging**  
**Systems and Techniques**
  
- 2014-pr**      **Committee Vice Chair – Editor (imaging) of Medical Physics Editorial Board**
  
- 2014-pr**      **Co-Chair Working Group 1 of Medical Physics Journal Editorial Board**  
**(Improving review process efficiency, quality, and selectivity)**
  
- 2014-pr**      **Member of Working Group 2 of Medical Physics Journal Editorial Board**  
**(Journal accessibility and marketing impact)**
  
- 2014-pr**      **Guest – Deputy Editor AAPM Journals Business Management Committee**
  
- 2014-pr**      **Member – AAPM Task Group No. 247 (Task Group on Editorial Transition)**
  
- 2013-pr**      **Member (as Chair of Tomosynthesis Subcommittee), AAPM Task Group**  
**234 – Task Group on Virtual Tools for the Evaluation of New 3D/4D Breast**  
**Imaging Systems**
  
- 2013-pr**      **Member of AAPM Task Group No. 245 (Tomosynthesis Quality Control)**
  
- 2012-pr**      **Member of AAPM Physics Education Task Force Subcommittee**
  
  
- 2012-pr**      **RSNA/AAPM Physics Task group member (review and modify RSNA/AAPM**  
**Physics teaching modules for radiology residents)**
  
- 2010-2016**    **Scientific Program Committee Member, Radiological Society of North**  
**America (RSNA) – Review >100 abstracts for each annual meeting.**
  
- 2010-2011**    **Scientific Program Director (Imaging), for 2011 AAPM Meeting, American**  
**Association of Physicists in Medicine (AAPM)**
  
- 2009-2010**    **Scientific Program Co-Director (Imaging) for 2010 AAPM Meeting,**  
**American Association of Physicists in Medicine (AAPM)**
  
- 2009-pr**      **Member of American Association of Physicists in Medicine (AAPM) Ad Hoc**  
**Committee on the Establishment of a Technology Assessment**  
**Institute [[AHETA](#)]**

- 2009-pr** Member of AAPM Imaging Physics Committee [[IPC](#)] *as co-Chair of Tomosynthesis Subcommittee (co-chair until end of 2016)*
- 2008-11** Member of AAPM Radiography and Fluoroscopy Subcommittee [[SCRF](#)] of Task Group No. 171 - Co-Chair
- 2009-2014** Co-Chair of AAPM Ultrasound Subcommittee [[ULSC](#)]
- 1995-2014** Chair of AAPM Working Group on Quantitative B-mode Ultrasound QC Test Development [[US01](#)]
- 2011-2016** Co-chair of AAPM Tomosynthesis Subcommittee
- 2008-11** Co-Chair AAPM Task Group #171 Tomosynthesis
- 2008-16** AAPM Liaison to the Physics Subcommittee of the Scientific Program Committee of the Radiological Society of North America (RSNA) This subcommittee reviews and selects all scientific papers in the Physics sessions for the RSNA meeting and organizes special physics symposia. (Appointed by the Board of directors of the RSNA upon the recommendation of the AAPM.)
- 2007-pr** International Atomic Energy Agency (IAEA) Expert in Diagnostic Radiology Physics
- 2007-9** Consultant to the American College of Radiology (ACR) Subcommittee on Pregnant Patients headed by Louis Wagner of the University of Texas Medical School. I was on the Drafting Committee and Comments Reconciliation Committee for the ACR Practice Guideline for Imaging Pregnant or Potentially Pregnant Adolescents and Women with Ionizing Radiation.
- 2003-5** Member of General Electric Medical Systems CT Physics ALARA Medical Advisory Board – A national board of physicists who meet with GE scientists to advise them on CT radiation dose issues.
- 1992-pr** Reviewer of abstracts for annual AAPM meetings.
- 1987-pr** Member of AAPM Ultrasound Subcommittee [[ULSC](#)]

- 1990-pr**      **AAPM Science Council Ultrasound Task Group No. 1 [US01], QA, Phantoms, Standards (Present Task Group Chair)**
- 2016**      **Co-moderator of Mammography/Radiography/Fluoroscopy- Radiation Dose, Imaging Scientific Session** at the 58th Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, July 31- Aug 4, 2016, Washington DC (Med Phys 2016; 43(6), 3235)
- 2016**      **Co-moderator of Physics (Dose in Radiography, Fluoro and Mammography)) a Scientific Session** at the 102nd RSNA Meeting, Nov. 27-December 2, 2016, Chicago, IL (RSNA 2016 Program, page 120)
- 2015**      **Moderator of Physics (Radiation Dose Measurement)** a Scientific Session at the 101st RSNA Meeting, Nov. 29-December 4, 2015, Chicago, IL (RSNA 2015 Program, page 177)
- 2015**      **Co-moderator Radiography, Fluoroscopy – Radiation Dose and Quality Assurance,** Imaging Scientific Session at the 57th Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, July 12- July 16, 2015 Anaheim, CA (**Med Phys 2015; 42 (6), page 3182**)
- 2014**      **Co-moderator of Physics (Radiation Dose II: Radiography, Fluoroscopy, Mammography)** a Scientific Session at the 100th RSNA Meeting, Nov. 25-December 3, 2014, Chicago, IL (RSNA 2014 Program, page 201)
- 2014**      **Co-moderator of CT Image Quality, Imaging Scientific Session** at the 56th Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, July 20- July 24, 2014 Austin, TX
- 2013**      **Co-moderator of Novel CT Topics Imaging Snap Oral** Imaging Scientific Session at the 55th Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, Aug 4-8, 2013 Indianapolis, IN (page 28 of program)
- 2012**      **Co-moderator of Novel Imaging Sources/Modalities,** Imaging Scientific Session at the 54th Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, July 29- Aug2, 2012 Charlotte, NC

- 2012**      **Co-moderator of Physics (Population Dose Surveys)** a Scientific Session at the 98th RSNA Meeting, Nov. 25-Nov 30, 2012, Chicago, IL (RSNA 2012 Program, page 190)
- 2011**      **Co-moderator of Physics (Population Dose Surveys)** a Scientific Session at the 97th RSNA Meeting, Nov. 27-Dec. 2, 2011, Chicago, IL (RSNA 2011 Program, page 167)
- 2010**      **Co-moderator of Physics (Population Dose Surveys)** a Scientific Session at the 96th RSNA Meeting, Nov. 28-Dec. 3, 2010, Chicago, IL (RSNA 2010 Program, page 303)
- 2010      Co-chair Advances in CT Dose Reduction and CT Dose Measurement Scientific Session at the 52nd Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, July 18-22, 2010, Philadelphia, PA
- 2010      Co-chair Advances in Breast Imaging Scientific Session at the 5nd Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, July 18-22, 2010, Philadelphia, PA
- 2009**      **Reviewer of RSNA-AAPM web-based educational modules for Radiology Residents.**
- 2009      Co-chair Computed Tomography and Radiation Dose Scientific Session at the 51<sup>st</sup> Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, July 26-30, 2009, Anaheim, CA
- 2008      Presiding Officer of Physics (Dosimetry) (with Larry Rothenberg), a Scientific Session at the 94th RSNA Meeting, Nov. 30-Dec 5, 2008, Chicago, IL (RSNA 2008 Program, page 406)
- 2008      Session moderator and organizer – Ultrasound for the 21<sup>st</sup> Century – presented at the 50<sup>th</sup> Annual Meeting of the American Association of Physicists in Medicine, July 28, 2008, Houston, Texas.
- 2007      Presiding Officer of Physics (Diagnostic Radiography – Image Quality (with Gary Barnes), a Scientific Session at the 93rd RSNA Meeting, Nov. 25-30, 2007, Chicago, IL (RSNA 2007 Program, page 498)
- 2007      Co-chair Breast Imaging – Ultrasound and Tomosynthesis Session at the 49th Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, July 22-26, 2007, Minneapolis, MN



- 2006**      **Reviewer of Grant Proposal for the Science and Technology Center in Ukraine (STCU). “The main objective of the STCU is to help minimize proliferation of weapons of mass destruction by providing funding for weapons scientists and engineers in the former Soviet Union to conduct non-weapons research.” (See: [www.stcu.int](http://www.stcu.int)) I reviewed a grant on medical ultrasound research. I was invited to do so by a Senior Science Advisor to the US Department of State.**
- 2006      Presiding Officer of Physics (CT: Dual Source) (with Willi Kalender of Erlangen, Germany), a Scientific Session held on Weds Nov. 29, 2006 at the 92nd RSNA Meeting, Chicago, IL (RSNA 2006 Program, page 504)
- 2006      Chair Imaging Performance Measurement and Modeling Session at the 48th Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, August 3, 2006, Orlando, FL
- 2006      **Reviewer of a Minority Research Support (MBRS) Program subproject grant for the National Institutes of Health (NIH).**
- 2005      **Reviewer of a Medical Physics research grant for the Health Research Board in Ireland (73 Lower Baggot Street, Dublin 2, Ireland)**
- 2005      **Study Section Member for review of grants submitted to the RSNA Research and Education Foundation. (Chicago, IL April 1-2, 2005)**
- 2005      Presiding Officer of Physics (CT Dose) (with Michael McNitt-Gray of UCLA), a Scientific Session held on Monday, Nov. 28, 2005 at the 91st RSNA Meeting, Chicago, IL (RSNA 2005 Program, page 266)
- 2004      Chair Mammography I Session at the 46th Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, July 27th, 2004, Pittsburgh, PA.
- 2004      **Reviewer of a Minority Research Support (MBRS) Program subproject grant for the National Institutes of Health (NIH).**
- 2003      Presiding Officer of Physics Imaging Technologies: Various Topics Scientific Poster Session held on Wednesday, December 3, 2003 at the 89<sup>th</sup> RSNA Meeting, Chicago, IL

- 2003 Chair Dosimetry in Fluoroscopy Session at the 45th Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, August 12<sup>th</sup>, 2003, San Diego, CA.
- 2003 **Study Section Member for review of grants submitted to the RSNA Research and Education Foundation. (Chicago, IL March 14 -15, 2003)**
- 2002-5 **Member of Data Safety and Monitoring Committee for the Digital Mammography Imaging Screening Trial (DMIST) conducted by the American College of Radiology Imaging Network. I was invited to be the sole Medical Physicist member of this committee, which reviewed the results of a large screening trial comparing digital mammography with film-screen mammography.**
- 2002 Presiding Officer of Physics (CT Image Quality and Dose), a Scientific Poster Session held on Monday, December 2, 2002 at the 88<sup>th</sup> RSNA Meeting, Chicago, IL (Radiology 2002; 225(P): 345)
- 2001 Chair of Diagnostic Radiation Safety scientific session at the 41st Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, July 22-26, Salt Lake City, Utah.
- 2001 Presiding Officer of Physics (CT Vascular Enhancement and CT Fluoroscopy), a Scientific Session held on Tuesday, Nov. 27, 2001 at the 87<sup>th</sup> RSNA Meeting, Chicago, IL (Radiology 2001)
- 2000 Chair of Bone Mineral/Absorptiometry session at the Chicago 2000 World Congress on Medical Physics and Biomedical Engineering, Chicago Navy Pier in Chicago, IL, July 23-28, 2000
- 2000 **Writer of questions for American Board of Radiology (ABR) Oral Physics Examination.**
- 1999 Presiding Officer of Physics (Image Processing: General Applications), a Scientific Session held on Tuesday, Nov. 30, 1999 at the 85<sup>th</sup> RSNA Meeting, Chicago, IL (Radiology 1999: 213(P), 287-288)
- 1998 Co-chair of Diagnostic Radiography: Dosimetry & Radiation Protection scientific session at the 40th Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, August 9-13, 1998, San Antonio, Texas

- 1997 Presiding Officer of Physics (Diagnostic x-ray: Computed Radiography), a Scientific Session held on Wednesday, Dec. 3, 1997 at the 83<sup>rd</sup> RSNA Meeting, Chicago, Ill (Radiology 1997: 205(P), 392-394)
- 1997 Co-chair of CT scientific session at the 39th Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, July 27-31, 1997, Milwaukee, Wisconsin
- 1996-1997 Scientific Program Director, American Association of Physicists in Medicine (Same duties as Co-Director listed below ('95-96) plus write/edit letters of acceptance and rejection and responsible for more decisions regarding meeting format.)**
- 1996 Presiding Officer of Physics (X-ray: Advanced Techniques), a Scientific Session held on Monday, Dec. 2, 1996 at the 82<sup>nd</sup> RSNA Meeting, Chicago, Ill (Radiology 1996: 201(P), 220)
- 1995-2002 Member, Program Committee, American Association of Physicists in Medicine.
- 1995-6 Scientific Program Co-Director, American Association of Physicists in Medicine (I organized and coordinated the diagnostic medical physics portions of the annual national meeting. This consisted of conceiving the topics for eight 1-hour refresher courses and four 1.5- hour symposia, soliciting scientists to present those courses and symposia, soliciting the help of over 30 medical physicists to review submitted abstracts for the meeting, analyzing the review results to accept and reject abstracts, deciding upon session topics and ordering all accepted talks and poster presentations in those sessions. I also introduced some symposia speakers at the meeting.)**
- 1994 Co-chair of Mammography scientific session at the 36th Annual Meeting and Technical Exhibition of the American Association of Physicists in Medicine, July 24-28, 1994, Anaheim, California
- 1991 **Co-moderator of a session on Errors in DXA and QCT at the Eighth International Workshop on Bone Densitometry, in Bad Reichenhall, Germany**
- 1989 **Co-moderator of a session on Improving Existing Technologies at the Seventh International Workshop on Bone Densitometry, in Rancho Mirage, California.**

**(I presented a 45 minute talk on this subject and summarized 10 poster sessions)**

- 1987-94      AAPM Task Force Group: Image Intensifier - TV Chain
- 1987-90      AAPM Committee: Diagnostic X-ray Imaging
- 1987-90      AAPM Task Force Group: Standardized Methods for Measuring X-ray Exposures
- 1987            **NIH Special Review Study Section on Small Business Innovative Research Grants. (Diagnostic Imaging, Display and Analysis).**

### **Committee and Administrative Services (University of Michigan)**

- 2017- pr      **Chair of APT (appointments, promotions and tenure) Basic Sciences Committee of the Department of Radiology**
- 2013-pr      **Member of the University of Michigan Hospital Clinical Radiation Safety Committee**
- 2012-2016    **Member of APT (appointments, promotions and tenure) Basic Sciences Committee of the Department of Radiology**
- 2011-pr      **Member of CT Operations Committee of the Department of Radiology**
- 2004-pr      **Member of the Radiation Risk Subcommittee of the Institutional Review Board (IRB), University of Michigan**
- 1996-pr      **Member, University of Michigan Radiation Policy Committee (RPC)**
- 1992-pr      **Chairman of X-ray Equipment Quality Control Committee of the Department of Radiology, University of Michigan**
- 1992-2012    **Chairman of Technical Quality Management (TQM) Committee of the Department of Radiology, University of Michigan**

## Previous Special Local Responsibilities:

- |         |  |
|---------|--|
| 1992-94 | Member of Radiology Quality Management Committee, University of Michigan.                          |
| 1992    | Reviewer of grant proposals to the Royalty Research Fund of the University of Washington, Seattle  |
| 1987-91 | Member, Diagnostic Imaging Research Scientist Search Committee at the University Hospital, Seattle |
| 1986-87 | Member, Nuclear Medicine Medical Doctor Search Committee at the VA Hospital, Seattle               |

## Grant Support:

### ACTIVE:

R01 CA214981 (Chan, Fessler) 1/10/2018 – 12/31/2021.

NIH

Advanced breast tomosynthesis reconstruction for improved cancer diagnosis

The goal of the proposed project is to develop a model-based statistical iterative reconstruction method for DBT by accurate physics modeling of the DBT system to improve the image quality and reduce noise, thereby improving the accuracy of breast cancer detection and reducing radiation dose

Role: Co-Investigator

U01 EB018753 (Fessler)

08/01/2014-07/31/2018

NIH

Accelerated Statistical Image Reconstruction Methods for X-ray CT

The primary goal of this project is to develop significantly faster SIR algorithms that will enable routine use of SIR methods for all types of CT scans, particularly sub-mSv scans. The methods developed will be applicable to a wide variety of image acquisition geometries and statistical cost functions, and thus will complement advances in these components by other researchers.

Role: Co-Investigator

17-PAF05018 (Chan)

02/22/2017– 12/21/2018

GE Healthcare

Study of Image Quality and Dose in Breast Tomosynthesis Imaging

The goal of the proposed project is to evaluate the effects of dose on image quality of DBT on the GE Pristina system and to identify the most cost-effective imaging techniques for improving lesion detection.

Role: Co-Investigator

## **Submitted GRANT APPLICATIONS:**

16-PAF06588 (Carson)

05/01/2017-04/30/2022

NIH

Automated Reflection and Transmission Ultrasound Integrated with Mammography

Our goal is twofold: (1) Produce and verify reflection mode (pulse echo) and quantitative SOS images of the whole human breast in this important geometry in a two-view, two-breast exam that takes 15 min or less. The quality of these images must be judged by radiologists, imaging scientists and quantitative measures as promising for meeting the long term goals of maintaining or improving the increased cancer detection rate expected from adjunctive US screening, while reducing the recalls for further diagnosis and biopsy. (2) Conduct a simulated screening study of 150 women to test whether ARTIMUS, integrated with DBT, reduces the recall rate from DBT plus supine ABUS and reading time, while maintaining the sensitivity of DBT.

Role: Co-Investigator

## **RECENT PAST**

15-PAF04328 (Carson)

02/03/2015-08/12/16

extended to 6/30/2017

GE Global Research

Ultrasound/DBT Prototype System Evaluation

Perform study of 10 to 20 patients and volunteers. Group 1, asymptomatic volunteers (5); Group 2, patients going to biopsy with suspected masses and diagnostic patients with asymmetries and possible masses. (10-15) Evaluate ergonomics and coupling and scanning methods. Test revised dry coupling blocks. Compare diagnosis of asymmetries and masses using DBT with and without fused ABUS. Statistical significance not expected. Compare diagnosis of masses using DBT with fused ABUS vs DBT with hand controlled ultrasound.

Role: Co-Investigator

R01-CA151433 (Chan)

09/02/2011-07/31/2017

NIH

Improvement of Microcalcification Detection in Digital Breast Tomosynthesis

The main goal of the Partnership between the University of Michigan Computer-Aided Diagnosis Research Laboratory (UM) and GE Global Research (GE) is to develop an integrated practical approach to resolving the MC visualization and detection problems in DBT without increasing patient dose, thereby facilitating the eventual replacement of FFDM by DBT.

Role: Co-Investigator

R01-CA151433 (Chan)

09/02/2011-07/31/2016

NIH

Improvement of Microcalcification Detection in Digital Breast Tomosynthesis

The main goal of the Partnership between the University of Michigan Computer-Aided Diagnosis Research Laboratory (UM) and GE Global Research (GE) is to develop an integrated practical approach to resolving the MC visualization and detection problems in DBT without increasing patient dose, thereby facilitating the eventual replacement of FFDM by DBT.

Role: Co-Investigator

R01 HL106545 (Chan)

12/15/2010-11/30/2015

NIH

Computer-aided detection of non-calcified plaques in coronary CT angiograms

The main goal of this project is to develop machine learning and image analysis methods to assist radiologists in detection of non-calcified plaques in coronary CT angiograms.

Role: Co-Investigator

R01 CA091713 (PI: Carson, Paul)

08/25/2008 – 05/31/2013

NIH

Title: Combined Digital X-Ray Optical and Ultrasound Breast Imaging

This program will develop a proof of concept system for performing all three, x-ray, ultrasound and optical, imaging modes in 3D and in the same view, with extraction of mutually beneficial image corrections and diagnostic information between the modes. Building on results of the previous BRP, a comfortable, compression system will be demonstrated that will show some of the capabilities of each of these modalities to guide development of clinical systems in a cost effective manner.

Role: Co-Investigator

R01 HL098686 (PI: Fessler, Jeff)

08/01/2010 – 05/31/2013

NIH

Model-Based Image Reconstruction for X-ray CT in Lung Imaging

The goal of this research is two-fold: (i) to develop advanced reconstruction methods that can provide CT image quality that is comparable to current standards, but can be obtained with significantly lower X-ray radiation doses suitable for screening applications, and (ii) to develop methods that improve CT image quality at current X-ray doses in applications for which improved spatial resolution for visualizing small features like airways is needed clinically.

Role: Co-Investigator

Dates: September 1, 2006 – August 31, 2011

Title: Digital Tomosynthesis Mammography: Computer-Aided Analysis of Masses

Agency: NIH R33 CA120234

Function: co-investigator (phantom studies and technical and QA aspects of patient case collection) (PI: Heang-Ping Chan, Ph.D.)

Dates: July 1, 2007 – June 30, 2012

Title: SPECT/CT Image-Based Dosimetry in Radionuclide Therapy

Agency: NIH R01 EB001994

Function: Co- Investigator  
(PI: Yuni K. Dewaraja Ph.D.)

Dates: January 1, 2002 - December 31, 2008  
Title: Computer-aided diagnosis of lung cancer in thoracic computed tomograms  
Agency: NIH/NCI  
Function: Co- investigator (PI: Heang-Ping Chan, Ph.D.)

Dates: September 1, 2002-August 31, 2008  
Title: Combined X-ray and Ultrasound Breast Imaging  
Agency: NIH RO1 CA91713  
Function: Co-Principal Investigator (PI: Paul Carson, Ph.D.)

Dates: September 1, 2006-August 31, 2007  
Title: Digital Tomosynthesis Mammography: Computer-Aided Analysis of Masses  
Agency: NIH  
Function: Co- Investigator (PI: Heang-Ping Chan, Ph.D.)

Dates: July 1, 2001 – June 30, 2006  
Title: Lung Image Database  
Agency: NIH/NCI  
Function: Co- investigator  
(PI: Charles Meyer, Ph.D.)

Dates: October 1, 2002 – September 30, 2005  
Title: Digital and Conventional Chest Radiographs in the Recognition and Classification of Pneumoconiosis: A Comparative Study  
Agency: ASPH  
Function: Co-investigator (PI: Al Franzblau, School of Public Health)

Dates: September 1, 1999 – August 31, 2002 (extended to 10/13/04)  
Title: Automated Spot Mammography for Improved Imaging of Dense Breasts  
Agency: United States Army Medical Research and Materiel Command  
Function: Principal Investigator

Dates: April 20, 1998 – April 19, 2001 (extended to April 19, 2003)  
Title: Development of Digital Stereoscopic Imaging Technique for Mammography



Agency: United States Army Medical Research and Materiel Command  
 Function: Co-investigator (PI: Heang-Ping Chan)

Dates: October 1, 1998 – September 30, 2000 (Extended to Sept. 30, 2001)  
 Title: Support of Clinical Residencies in Diagnostic Medical Physics  
 Agency: The Radiological Society of North America  
 Function: Program Director (recipient of award)

Dates: February 1, 1997 - July 31, 1998 (extended to July 31, 2001)  
 Title: Efficacy of Ultrasound Quality Control Programs.  
 Agency: Computerized Imaging Reference Systems (CIRS), Inc.  
 Function: Principal Investigator

Dates: July 11, 1994 - July 10, 1998 (extended to July 10, 1999)  
 Title: Improved Mammographic Technique for Breast Cancer Diagnosis  
 Agency: United States Army Medical Research and Development Command  
 Grant #: DAMD 17-94-J-4292  
 Function: Co-Principal Investigator with Heang-Ping Chan, Ph.D.)

Dates: May 1, 1992 - April 30, 1996.  
 Title: Development of Computer-Based Techniques in Mammography.  
 Agency: National Institutes of Health  
 Grant #: USPHS Grant #CA 48129  
 Function: Co-investigator (PI: Heang-Ping Chan, Ph.D.)

Dates: 4/1/89 - 3/31/92  
 Title: A Combined Dual Photon Absorptiometry /Total Tissue Thickness Method for Analyzing Body Composition  
 Agency: Whitaker Foundation  
 Function: Principal Investigator

Dates: 9/1/88 - 8/31/91  
 Title: Analysis of Mineral and Fat Content by Quantitative CT  
 Agency: NIH  
 Grant #: RO1 AR39215  
 Function: Principal Investigator

Dates: 4/1/87 - 3/31/89  
 Function: PI  
 Title: CT Mineral Analysis  
 Agency: NIH/UW Biomedical Research Support Grant  
 Function: Principal Investigator

## Honors and Awards

- 2015, 2016**    **Making a Difference Award**, Radiology Department University of Michigan
- 2012**        **Certificate of Merit award for education exhibit**, "Achieving Significant Radiation Dose Reduction for Abdomen CT While Maintaining Diagnostic Image Quality: How to Orchestrate the Symphony of Multiple Variables to Get the Right Note" presented at the 2012 RSNA meeting (Co-author, Ravi Kaza, MD principal author).
- 2010**        **Certificate of Merit award for education exhibit**, "Quantitative Evaluation with Fast kV Switch Dual-Energy CT of Abdomen: Understanding the Colors and Curves, Graphs and Plots" presented at the 2010 RSNA meeting (Co-author, Ravi Kaza, MD principal author).
- 2004**        **Elected a Fellow of the American Association of Physicists in Medicine (AAPM).**
- 2000        University of Michigan Department of Radiology Physics Teaching Award (Awarded at Residents' Banquet, June 9, 2000)
- 1994        **Editor's Recognition Award for Distinction in Reviewing, Radiology**
- 1993        **Editor's Recognition Award for Distinction in Reviewing, Radiology**
- 1992        **Editor's Recognition Award for Distinction in Reviewing, Radiology**
- 1989        **Hounsfield Award:** Baron RL, **Goodsitt MM**, Schulte SJ, Lee SP, Shuman WP, Rohrman CA. Factors Determining CT Appearances of Gallstones: Answers from Dual Energy CT, Annual Meeting of the Society of Body Computed Tomography. Washington DC, April 10-14, 1989.
- 1988        Special Recognition by the Radiology Residents at the University of Washington for Excellence in Teaching Physics (Residents' Banquet, June, 1988)
- 1974        Phi Kappa Phi honorary fraternity
- 1974        Graduated with distinction - University of Wisconsin (overall grade point average: 3.8 on a 0 to 4.0 scale)

1970, 1971 University of Wisconsin Scholarship  
1970 National Honor Society

## **Memberships in Professional Societies**

**2011-pr Radiological Society of North America (RSNA)**  
**1988-2005 Association of University Radiologists (AUR)**  
**1976-pr American Association of Physicists in Medicine (AAPM)**  
**1982-2003 American Institute of Ultrasound in Medicine (AIUM)**

## **Teaching Activities**

Major Teaching Responsibilities:

**2018-pr Discussion leader in Nuclear Engineering and Radiological Sciences  
NERS 590 Radiation Protection and Safety course**

**2014-pr Lecturer in Medical Student Elective period 1 & 4 (M4 2016,2017, 2018)  
student seminar course.**

**1992-pr Course Director - Physics of Diagnostic Radiology for Radiology Residents,  
University of Michigan.**

**1992-pr Course Director – Physics of Diagnostic Radiology (EHS 692 and NERS 579  
graduate courses**

**1998-pr Course lecturer on X-ray Physics / Digital Radiography lab co-director –  
Biomedical Engineering 510 (Medical Imaging lab)**

**2015-pr NERS 586. Lecture and tour of radiology department.**

2011-pr	Biophysics 116 Lecture and tours of the radiology department
2008	Wrote examination questions for Nuclear Engineering and Radiological Sciences (NERS) Doctoral Qualifying Examinations.
<b>1993-pr</b>	Radiation Safety In-service - to imaging employees in the Radiology department at the University of Michigan.
2007,2010	NERS 582 lecture and tours of our radiology department and research area.
2006,7	Wrote and graded examination questions for Nuclear Engineering and Radiological Sciences (NERS) Doctoral Qualifying Examination.
2006	NERS 586 lecture, tours and labs (imaging and digital radiography)
2005	Wrote and graded examination questions for Nuclear Engineering and Radiological Sciences (NERS) Doctoral Qualifying Examinations.
2005	NERS 583 lectures on quality control of diagnostic x-ray and fluoroscopy systems and labs.
2004	<b>Created 3 lectures (on-line video presentations) for University of Michigan Radiation Safety Privileging Course for Non-radiologists (Radiation Safety, Physics of Diagnostic X-rays and Fluoroscopy, Fluoroscopy Controls, plus a written examination).</b>
2004	Wrote and graded examination questions for Nuclear Engineering and Radiological Sciences (NERS) Doctoral Qualifying Examinations.
2004	NERS 490 lectures on Diagnostic X-ray Quality Control and X-ray research
2003	Wrote and graded 2 examination questions for Nuclear Engineering and Radiological Sciences (NERS) Doctoral Qualifying Examination
1997	Nuclear Engineering 590 - lectures on the Physics of CT and CT Quality Control.
1995-1999	Nuclear Engineering 582 lectures, tours of department and a demonstration of CR imaging.

- 1993 Course Lecturer - Basic Physics of Clinical Imaging Methods; a joint-taught University of Michigan Course for medical students. I presented 9 lecture hours.
- 1988-1992 Course Director - Physical Aspects of Medical Imaging; a 4 credit University of Washington course for Bioengineering and Radiological Sciences graduate students. (Joint listed as Radiology 508, Bioengineering 508, and Radiological Sciences 508). (I organized the course, presented 17 of 19 lectures, wrote and graded homework and exams, and graded oral presentations and research papers.) (27 lecture hours per year)
- 1986-1992 Physics Lecturer - Introduction to Clinical Radiology; University of Washington course for medical students. (Radiology 693).
- 1986-1992 Course Director - Physics Board Review for RV Radiology Residents at the University of Washington
- 1986-1992 Course Director - Physics of Diagnostic Radiology for RII Radiology Residents at the University of Washington
- 1985-1986 Guest Lecturer - MGH's School of Radiation Technology
- 1984-1986 Course Director - Physics of Diagnostic Ultrasound, MGH's School for ultrasound technologists
- 1982-1983 Physics Lecturer (Ultrasound and Digital Radiology) - MGH Physics course for radiology residents.
- 1982-1985 Course Director - Physics of Diagnostic Radiology, Massachusetts General Hospital's (MGH's) School of Radiation Technology.
- 1978 Teaching Assistant - Physics of Diagnostic Radiology, University of Wisconsin course for Medical Physics graduate students.

### **Graduate Students Supervised**

21 students, member of PhD supervisory committees for 16 and MS supervisory committees for 2.

### **Clinical Medical Physics Post-Doctoral Fellows Supervised and Mentored - 6**

## Other Quality Control Medical Physicist Trainees -2

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#### Completed Publications – Peer Reviewed

(♠ one of five most significant scholarly works since arriving at University of Michigan.)

1. Kruger RA, Mistretta CA, Crummy AB, Sackett JP, **Goodsitt MM**, Riederer SJ, Houk TL, Shaw CG, Flemming D. Digital K-edge Subtraction Radiography. *Radiology* 1977; 125:243-45. PMID: 408875
2. Kruger RA, Mistretta CA, Lancaster J, Houk TL, **Goodsitt MM**, Riederer SJ, Hicks J, Sackett J, Crummy AB, Flemming D. A Digital Video Image Processor for Real Time Subtraction Imaging. *Optical Engineering* 1978; 17(6).
3. Kruger RA, Mistretta CA, Houk TL, Riederer SJ, Shaw CG **Goodsitt MM**, Crummy AB, Zweibel W, Lancaster JC, Rowe GG, Flemming D. Computerized Fluoroscopy in Real Time for Noninvasive Visualization of the Cardiovascular System, Preliminary Studies. *Radiology* 1979; 30:49-57. PMID: 364537
4. **Goodsitt MM**, Banjavic RA, Zagzebski JA, Madsen EL. An Automated Transducer Beam Profiling System. *Radiology* 1979; 132:220-222. PMID: 451204
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6. Banjavic RA, Zagzebski JA, Madsen EL, **Goodsitt MM**. Distortion of Ultrasound Beams in Attenuating Media. *Acoustical Imaging & Holography* 1979; 1:165-177.
7. Jafari F, Madsen E, Zagzebski J, **Goodsitt MM**. Exact Evaluation of Ultrasonic Scattering Formula for a Rigid, Immovable Sphere. *Ultrasound in Med. Biol.* 1981; 7:293-296. PMID: 7268938
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10. **Goodsitt MM**, Madsen EL, Zagzebski JA. A Three Dimensional Model for Generating the Texture in B-Scan Ultrasound Images. *Ultrasonic Imaging* 1983; 5:253-279. PMID: 6685369
11. Burke TM, **Goodsitt MM**, Madsen EL, Zagzebski JA. Angular Distribution of Scattered Ultrasound from a Simple Steel Sphere in Agar Gelatin: A Comparison between Theory and Experiment. *Ultrasonic Imaging* 1984; 6:342-347. PMID: 6396927
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13. Zagzebski JA, Madsen EL, **Goodsitt MM**. Quantitative Tests of a Three-Dimensional Gray Scale Texture Model. *Ultrasonic Imaging* 1985; 7:252-263. PMID: 3913099
14. Hesselink JR, Chang EH, Chung KJ, Abbate L, **Goodsitt MM**. Flow Analysis with Digital Subtraction Angiography: Part 2. Optimum Data Acquisition and Accuracy of Transit Flow Measurements. *Amer. J. of Neuroradiol* 1986; 7(3):427-431 PMID: 3085448
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- 102 E Christodoulou, **M Goodsitt**, J Kim, B Bailey, Evaluation of the contrast-detail response of digital radiographic systems using the CDRAD contrast-detail phantom with the CDRAD Analyser software, Presented at the Presented at the 48th Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Orlando, FL, July 30-Aug 3, 2006, Medical Physics 2006; (General Poster)
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- 104 MA Roubidoux, MA Helvie, G LeCarpentier, **MM Goodsitt**, H Chan, PL Carson, A combined tomosynthesis – Breast ultrasound system: Initial results regarding coverage and mass visibility, Presented at the 92nd RSNA Meeting, Chicago, IL (RSNA 2006 Program, page 484) oral presentation

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- 106 E Angel, C Wellnitz, **M Goodsitt**, J DeMarco, C Cagnon, M Ghatali, D Cody, D Stevens, C McCollough, A Primak, M McNitt-Gray, Radiation dose from MDCT using Monte Carlo simulations: Estimating fetal dose due to pulmonary embolism scans accounting for overscan. Poster presented at the 2007 SPIE Meeting, San Diego, CA Feb, 2007. poster presentation
- 107 **M Goodsitt\***, H Chan, T Way, S Larson, E Christodoulou, Single- and Dual-energy CT Calibration Lines for Assessing the Calcium Content of Lung Nodules: Effects of Patient Body and Lung Nodule Size. Poster to be presented at the 49th Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Minneapolis, MN, July 22-July 26, 2007 (Medical Physics 2007; 34: 2339). General Poster
- 108 S Sinha, G Narayanasamy, R Naraynan, M Roubidoux, G LeCarpentier, **M Goodsitt**, J Fowlkes, P Carson\*, Image Registration for Change Detection and Quantification in Multimodality Breast Tomosynthesis and Ultrasound. Poster to be presented at the 49th Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Minneapolis, MN, July 22-July 26, 2007 (Medical Physics 2007; 34: 2305). General Poster
- 109 J Stayman\*, J Alspaugh, **M Goodsitt**, E Christodoulou, A Dedicated Portable Head and Neck Volume CT Scanner, Oral Presentation at the 49th Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Minneapolis, MN, July 22-July 26, 2007 (Medical Physics 2007; 34: 2633).
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- 111 MA Roubidoux, SP Sinha, AV Nees, MA Helvie, **MM Goodsitt**, PL Carson, Dual Modality 3D Imaging with Digital Tomosynthesis Mammography and Automated Ultrasound: Reader Study, Presented at the 93rd RSNA Meeting, Chicago, IL (RSNA 2007 Program, page 431) oral presentation.
- 112 **MM Goodsitt**, EG Christodoulou, SC Larson, E Kazerooni, N Bogot and L Frank, Bismuth Shields vs. mAs Reduction for Decreased Radiation Dose to Breasts in CT

Examinations, presented at the 50th Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Houston, TX, July 27-July 31, 2008 (Medical Physics 2008;35: 2913) Moderated Poster

- 113 EG Christodoulou, **MM Goodsitt**, SC Larson, Investigation of the Relationship Between the Contrast-Detail Figure of Merit IQF<sub>inv</sub> and Three Characteristic Parameters of the Contrast-Detail Curve, presented at the 50th Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Houston, TX, July 27-July 31, 2008 (Medical Physics 2008;35; 2658) General Poster
  
- 114 SC Larson, **MM Goodsitt**, EG Christodoulou, The Effect of Copper Beam Filtration On the Transmission of Scattered X-Rays Through a Typical Lead Barrier presented at the 50th Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Houston, TX, July 27-July 31, 2008 (Medical Physics 2008; 35: 2879) Oral Presentation
  
- 115 Blane C, **Goodsitt M**, Grimm J, Pavlik J, March D, Ong J, Helvie M, New compression paddle for wire localization in mammography. Presented at the 94th RSNA Meeting, Chicago, IL (RSNA 2008 Program, page 658 ) oral presentation.
  
- 116 Helvie MA, Hadjiiski L, **Goodsitt MM**, Roubidoux MA, Carson P, Chan HP, Characterization of benign and malignant breast masses by digital breast tomosynthesis mammography o be presented at the 94th RSNA Meeting, Chicago, IL (RSNA 2008 Program, page 325 ) oral presentation.
  
- 117 **Goodsitt MM**, Christodoulou E, Evaluation of Noise and SDNR Characteristics of Blended ASIR and FBP Images Obtained with the GE Discovery CT 750 HD Scanner, to be presented the 51st Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Anaheim, CA, July 26-July 30, 2009 (Medical Physics 2009;36: 2432) Moderated Poster
  
- 118 Larson S, **Goodsitt M**, Christodoulou E, Gypsum Barrier Shielding Estimates for Two Cone-Beam CT Systems Dedicated to Head Imaging, to be presented the 51st Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Anaheim, CA, July 26-July 30, 2009 (Medical Physics 2009;36: 2448) General Poster
  
- 119 Christodoulou E, **Goodsitt M**, Bailey B, Young R, Effects of Added X-ray Beam Cu Filtration on Image Quality and Patient dose in Digital Radiography, presented the 51st Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Anaheim, CA, July 26-July 30, 2009 (Medical Physics 2009;36: 2713) Moderated Poster

- 120 **Goodsitt M**, Christodoulou E, Larson S, Accuracies of the Monochromatic CT Numbers and Effective Atomic Numbers Generated with the Rapid kVp Switching DE GE HD750 CT Scanner, presented at the 52nd Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Philadelphia, PA July 18-July 22, 2010(Medical Physics 2010;37: 3408) Oral Presentation
- 121 Rehani M (**presented by Goodsitt M**), Challenges and Experience in CT Dose Assessment & Dose Reduction- An International Perspective, presented by at the 52nd Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Philadelphia, PA July 18-July 22, 2010 (Medical Physics 2010;37: 3396) (M Goodsitt was asked by M Rehani of the IAEA to make this presentation because M Rehani could not obtain a VISA in time to attend the AAPM meeting ) Oral Presentation
- 122 Y. Lu, HP Chan, **M. Goodsitt**, J. Wei, L. Hadjiiski, A. Schmitz, J.W. Eberhard and B.E.H. Claus, Effects of projection-view distributions on image quality of calcifications in digital breast tomosynthesis (DBT), Proc. SPIE 7622, *Medical Imaging 2010: Physics of Medical Imaging*:76220D:1-8 SPIE International Symposium on Medical Imaging 2010, San Diego, CA, 2010.
- 123 **Y. Lu**, HP Chan, **M. Goodsitt**, J. Wei and L. Hadjiiski, A. Schmitz. Enhancement of Microcalcifications in Digital Breast Tomosynthesis (DBT): Effects of Contrast-Enhancing Regularization. *96th Scientific Assembly and Annual Meeting of the Radiological Society of North America*, Chicago, IL. November 28-Dec 3, 2010.
- 124 Y. Lu, HP Chan, J. F. Fessler, L. Hadjiiski, J. Wei, and **M. Goodsitt**. Adaptive Diffusion Regularization for Enhancement of Microcalcifications in Digital Breast Tomosynthesis (DBT) Reconstruction. *SPIE International Symposium of Medical Imaging 2011*, Orlando, FL, February12-17, 2011
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- 128 Christodoulou E, **Goodsitt M**, ICRP-103 Based Gender and Age-Specific DLP to Effective Dose Conversion Factors (k), to be presented at the at the 53rd Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Vancouver, BC July 31- Aug 4, , 2011(Medical Physics 2011;38: 3876) Oral Presentation
- 129 **Goodsitt M**, Larson S, Christodoulou E, The Effect of Region-of-Interest Z-axis Collimation on the Image Quality of a Commercial Cone Beam CT Imaging System, presented at the at the 53rd Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Vancouver, BC July 31- Aug 4, 2011(Medical Physics 2011;38: 3875) Oral Presentation
- 130 Howard D, **Goodsitt MM**, Wilderman S, Dewaraja YK, Evaluation of Dual-Energy Quantitative CT to Determine the Spatial Distribution of Red Marrow for Dosimetry in Internal Emitter Therapy, presented in the Physics (PET, SPECT, and Molecular Imaging) Scientific Session at the 97<sup>th</sup> Scientific Assembly and Annual Meeting of the RSNA, Chicago,, IL Nov. 27-Dec 2, 2011, page 227 of 2011 RSNA program, Oral Presentation
131. **Goodsitt M**, Chan H, , Christodoulou E, Larson S. The Effect of Model Based Iterative Reconstruction (GE-VEO) on the CT Numbers and Noise of Both Small Lung Nodules and Large Homogeneous (Heart and Spongiosa) Regions in an Anthropomorphic Chest Phantom., presented at the at the 54th Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Charlotte, NC July 29- Aug 2, 2012 (Medical Physics 2012;39: 4016) Oral Presentation
- 132 Chan HP, **Goodsitt MM**, Helvie MA, Paramagul CP, Neal CH, Carson PL, Digital Breast Tomosynthesis (DBT): Observer Performance Study of Microcalcification Cluster Detection in Breast Phantom DBT Acquired with Variable Angle Tomographic Angles, Angular Increments and Number of Projections. Scientific Session at the 98<sup>th</sup> Scientific Assembly and Annual Meeting of the RSNA, Chicago,, IL Nov. 25-Nov 30, 2012, page 61 of 2012 RSNA program, Oral Presentation

133. **Goodsitt MM**, Chan HP, Roubidoux MA, Noroozian N, Nees AV, Carson PL, The Effects of Total Acquisition Angle. and Angle Increment on the Detection of Masses and Perception of Contrast- detail Test Objects in Digital Breast Tomosynthesis., Scientific Session at the 98<sup>th</sup> Scientific Assembly and Annual Meeting of the RSNA, Chicago,, IL Nov. 25-Nov 30, 2012, page 240 of 2012 RSNA program, Scientific Informal (Poster) Oral Presentation
134. Kaza RK, Platt JF, **Goodsitt MM**, al-Hawaray MM, Maturen KE, Wasnick AP, Sub Milli-Sievert CT of Abdomen and Pelvis: From Unreachable Goal to Clinical Reality. Scientific Session at the 98<sup>th</sup> Scientific Assembly and Annual Meeting of the RSNA, Chicago,, IL Nov. 25-Nov 30, 2012, page 296 of 2012 RSNA program, Education Exhibit.
135. Kaza RK, Platt JF, **Goodsitt MM**, al-Hawaray MM, Wasnick AP, Achieving Significant Radiation Dose Reduction for Abdomen CT While Maintaining Diagnostic Image Quality: How to Orchestrate the Symphony of Multiple Variables to Get the Right Note. Scientific Session at the 98<sup>th</sup> Scientific Assembly and Annual Meeting of the RSNA, Chicago,, IL Nov. 25-Nov 30, 2012, page 296 of 2012 RSNA program, Education Exhibit.
136. A Shenoy\*, **M Goodsitt**, J Shen, M Schipper, Y Dewaraja, Investigation of Factors Affecting the Accuracy of a Dual Energy Quantitative CT Method for Estimating Regional Bone Marrow Cellularity TH-A-103-1 Thursday 8:00AM - 9:55AM Room: 103 presented at the at the 55th Annual Meeting of the American Association of Physicist in Medicine (AAPM) in Indianapolis, August 4-8, 2013 (Medical Physics 2013;) Oral Presentation
137. Kado, R.; Emily, S.; Lewis, E.; **Goodsitt MM**; et al.UTILITY AND ASSOCIATED RISK OF PULMONARY EMBOLISM CT SCANS IN THE MICHIGAN LUPUS COHORT Conference: 15th Annual European Congress of Rheumatology (EULAR) Location: Paris, FRANCE Date: JUN 11-14, 2014 ANNALS OF THE RHEUMATIC DISEASES Volume: 73 Supplement: 2 Pages: 81-81 Meeting Abstract: OP0055 Published: JUN 2014
138. Williamson, J.; Das, S.; **Goodsitt, M**.Session in Memory of Penny S. Slattery: Medical Physics Worksho Update: Journal improvement activities and guidance on writing and reviewing papers Conference: 57th Annual Meeting and Exhibition of the American-Association-of-Physicists-in-Medicine (AAPM) Location: Anaheim, CA Date: JUL 12-16, 2015 Sponsor(s): Amer Assoc Physicists Med MEDICAL PHYSICS Volume: 42 Issue: 6 Pages: 3721-3722 Published: JUN 2015



- 139 **Goodsitt M**, Chan H, Watcharotone K, Nan B, Christodoulou E. SU-C-206-02: Estimating Coronary Artery Plaque Composition with a Combined Dual-Energy and Single Energy QCT Optimization Model. *Med Phys.* 2016 Jun;43(6):3326. doi: 10.1118/1.4955584. PMID:28047135 Presented at the 2016 AAPM Annual Meeting, Washington DC
- 140 Scaduto DA, **Goodsitt M**, Chan HP, Olafsdottir H, Das M, Fredenberg E, Geiser W, Goodenough D, Heid P, Hu YH, Liu B, Mainprize J, Reiser I, Van Engen R, Varchena V, Vecchio S, Glick S, Zhao W. WE-DE-207B-05: Measuring Spatial Resolution in Digital Breast Tomosynthesis: Update of AAPM Task Group 245. *Med Phys.* 2016 Jun;43(6):3818. doi: 10.1118/1.4957865. PMID: 28047099 Presented at the 2016 AAPM Annual Meeting, Washington DC
141. **Goodsitt M**. Writing Good Scientific Papers and Responding to Critiques. Conference: 58th Annual Meeting and Exhibition of the American-Association-of-Physicists-in-Medicine (AAPM) Location: Washington, DC Date: JUL 31-AUG 04, 2016 Sponsor(s): Amer Assoc Physicists Med  
MEDICAL PHYSICS Volume: 43 Issue: 6 Pages: 3868-3869 Part: 45 Meeting Abstract: THC20403 Published: JUN 2016
- 142 Wanyi Fu ; Xiaoyu Tian ; Gregory Sturgeon ; Greeshma Agasthya ; William Paul Segars ; **Mitchell M. Goodsitt** ; Ella A. Kazerooni ; Ehsan Samei; Estimation of breast dose saving potential using a breast positioning technique for organ-based tube current modulated CT Proc. SPIE 9783, *Medical Imaging 2016: Physics of Medical Imaging*, 97833C (May 3, 2016); doi:10.1117/12.2217239.
- 143 Rungroj Jintamethasawat; Yunhao Zhu; Oliver D. Kripfgans; Jie Yuan; **Mitchell M. Goodsitt**; Paul L. Carson, Limited Angle Breast Ultrasound Tomography with A Priori Information and Artifact Removal Edited by: Duric, N; Heyde, B Conference on Medical Imaging - Ultrasonic Imaging and Tomography Location: Orlando, FL Date: FEB 15-16, 2017  
Sponsor(s): SPIE; Alpin Med Syst  
MEDICAL IMAGING 2017: ULTRASONIC IMAGING AND TOMOGRAPHY Book Series: Proceedings of SPIE Volume: 10139 Article Number: UNSP 101390N Published: 2017
- 144 Green, C.; **Goodsitt, M.**; Brock, K.; et al Deformable Mapping Technique to Correlate Lesions in X-Ray and Ultrasound Breast Images. Conference: 59th Annual Meeting and Exhibition of the American-Association-of-Physicists-in-Medicine (AAPM) Location: Denver, CO Date: JUL 30-AUG 03, 2017  
Sponsor(s): Amer Assoc Physicists Med

MEDICAL PHYSICS Volume: 44 Issue: 6 Pages: 3263-3263 Meeting Abstract: WE-G-601-0 Published: JUN 2017

- 145 Williamson, Jeffrey; Tarver, R.; Das, S.; **Goodsitt M.** Session in Memory of Alex Turner. Medical Physics Journal Workshop: An Update On the Journal's Improvement Activities and Guidance On Writing and Reviewing Papers, Conference: 59th Annual Meeting and Exhibition of the American-Association-of-Physicists-in-Medicine (AAPM) Location: Denver, CO Date: JUL 30-AUG 03, 2017 Sponsor(s): Amer Assoc Physicists MedMEDICAL PHYSICS Volume: 44 Issue: 6 Pages: 3296-3297 Meeting Abstract: TH-C-108-0 Published: JUN 2017

### Refresher courses / Workshops

1. Kimme-Smith C, **Goodsitt MM**, Miller H, Clayman W. Hands-on Ultrasound Quality Control. A 4.5 hour refresher course given at the 40th Annual Meeting of the American Association of Physicists in Medicine. San Antonio, Texas, August 9-13, 1998 (Medical Physics 1998; 25(7): A115)
2. Kimme-Smith C, **Goodsitt MM**, Boote E, Holland M, Zagzebski J, Miller H, Kofler J. . Hands-on Ultrasound Quality Control. A 4.5 hour refresher course given at the 41st Annual Meeting of the American Association of Physicists in Medicine. Nashville, TN, July 28, 1999 (Medical Physics 1999; 26(6): 1094, 1103)
3. Z Lu, J Kofler, R Kruger, **M Goodsitt**, P Carson, M Holland. Hands-On Ultrasound Physics and Quality Assurance Workshop. A 2 hour refresher course given at the 43rd Annual Meeting of the American Association of Physicists in Medicine. Salt Lake City, Utah (Medical Physics 2001; 28(6): 1275)
4. Z Lu, R Kruger. Hands-On Ultrasound Physics and Quality Control Workshop. A 4 hour refresher course presented at the 44th Annual Meeting of the American Association of Physicists in Medicine in Montreal, Quebec, Canada, July 14-18, 2002.(Medical Physics 2002;29:1313) (Note, only 2 authors included in abstract. Other instructors included Heather Miller, Paul Carson, Brian Fowlkes, and **Mitch Goodsitt**)
4. R Kruger, P Carson, B Fowlkes, **M Goodsitt**, J Kofler, Z Lu, H Miller, M Seddon. Ultrasound Hands-On Workshop. A 4 hour refresher course presented at the 45th Annual Meeting of the American Association of Physicists in Medicine in San Diego, CA, August 10-14, 2003. I participated for 2 hours (Medical Physics

2003;30: 1425)

5. **M. Goodsitt.** Digital Mammography QC Workshop for X-ray Technologists and Medical Physicists. A 3 ½ hour lecture and hands-on workshop presented at the Ninth International Radiological Technology and QA Conference/Workshop in Taiwan at the Tung's Taichung MetroHarbor Hospital, Taichung, Taiwan, August 27<sup>th</sup>, 2006
6. **M Goodsitt (presenter),** J T Dobbins III, History and Development of Tomosynthesis. A 30 minute lecture presented in the Update Course in Diagnostic Radiology Physics: Advances in Digital Tomosynthesis – From Physics to Clinical Application: Overview of Tomosynthesis at the 96<sup>th</sup> meeting of the RSNA, Chicago , IL, Nov. 28-Dec. 3, 2010, page 189 of program).
7. **M Goodsitt,** History and Development of Tomosynthesis. A 45 minute lecture presented in the Minicourse: Advances in Digital Tomosynthesis—From Physics to Clinical Applications at the 97<sup>th</sup> meeting of the RSNA, Chicago , IL, Nov. 27-Dec. 2, 2011, page 119 of program).
8. **Goodsitt MM,** conducted six 30 minute lab sessions on ultrasound Caliper Accuracy (Horizontal and Vertical) at the Hands-on Ultrasound Physics Workshop, MTMI (Medical Technology Management Institute, a continuing education division of Herzing University). Presented at Weber's Inn, Ann Arbor, February 21, 2015.
9. **Goodsitt MM,** conducted six 45 minute lab sessions on ultrasound caliper accuracy (horizontal and vertical) at the Hands-on Ultrasound Physics Workshop, MTMI (Medical Technology Management Institute, a continuing education division of Herzing University). Presented at the Sheraton Detroit Metro Airport Hotel, April 30, 2016.
10. **Goodsitt MM,** presented two 1 hour lectures (Basic Ultrasound Physics and Ultrasound QC Phantoms and tests (both SAMS lectures) and conducted 1 1-hour hands on scanning session on knobology reievw N 6 six 45 minute lab sessions on ultrasound caliper accuracy (horizontal and vertical) at the Hands-on Ultrasound Physics Workshop, MTMI (Medical Technology Management Institute, a continuing education division of Herzing University). Presented at the Courtyard by Marriott, Ann Arbor, MI, June 9 and 10, 2017.

## Invited presentations

1. Webster EW, **Goodsitt MM (presenter)**. Radiation: The Significance of Digital Imaging Dose Reduction, Current Trends in Radiology and Medical Imaging, Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts, Oct. 11-15, 1983.
2. **Goodsitt MM**. Principles of Digital Imaging, Radiology at the Massachusetts General Hospital - 1984, Boston, Massachusetts, October 9-12, 1984.
3. **Goodsitt MM**. Physics of Digital Imaging, Current Trends in Diagnostic Radiology. Intervention and Cross-Sectional Imaging, Massachusetts General Hospital, Harvard Medical School, Boston, MA, October 21-24, 1985.
4. Godwin DJ, **Goodsitt MM (both presenters)**. Motion Artifacts in Computed Tomography. A seminar presented in the Electrical Engineering 500B course at the University of Washington, October 24, 1988.
5. **Goodsitt MM**. Filmless Radiography. A seminar presented in the Electrical Engineering 500B course at the University of Washington, December 5, 1988.
6. **Goodsitt MM**. Improving Existing Technologies. A presentation at the Seventh International Workshop on Bone Densitometry, in Rancho Mirage, California, September 18, 1989.
7. **Goodsitt MM**. Precision of Quantitative CT: Impact of Dose and Matrix Size. Presented at the Precision of Quantitative CT In-Vitro and In-Vivo: Assessing and Eliminating Sources of Error workshop at the University of California, San Francisco, June 7 - 8, 1990.
8. **Goodsitt MM**. Technical and clinical perspectives of DXA and QCT - A panel discussion. I and six other panel members (Genant-USA, Dequeker-Belgium, Felsenberg-Germany, Hangartner-USA, Laval-Jeantet-France, and Tothill-United Kingdom) discussed this issue at the **Eighth International Workshop on Bone Densitometry in Bad Reichenhall, Germany**, April 30, 1991
9. **Goodsitt MM**. Setting up a mammography quality assurance program. University of Michigan Department of Radiology 7th Annual Symposium on Breast Disease, Grand Traverse Resort Village, Grand Traverse, Michigan, July 11-13, 1993.
10. **Goodsitt MM**. Dual-energy quantitative computed tomography and other topics from my research past, present, and future. Grand Rounds, University of Michigan Department of Radiology, November 11, 1993.

11. **Goodsitt MM**, Carson PL, Witt S, Kimme-Smith C, Zagzebski J, Hykes DL. Development of an ultrasound QA manual for the ACR accreditation program. Presented at the 36th Annual Meeting of the American Association of Physicists in Anaheim, California. July 24 - 28, 1994.
12. **Goodsitt MM**. Setting up a mammography quality assurance program. Presented at the University of Michigan Department of Radiology 8th Annual Symposium on Breast Disease, Shanty Creek Resort, Bellaire, Michigan, July 17-19, 1994.
13. **Goodsitt MM**. Radiation Safety. A 1 hour in-service for OR nurses. Presented in the Ford Amphitheater at the University of Michigan Hospital. August 18, 1994.
14. **Goodsitt MM**. A quantitative computed tomography technique for measuring the fat and mineral contents of vertebrae and other CT research topics. A colloquium presented to the University of Michigan Department of Nuclear Engineering, February 3, 1995.
15. **Goodsitt MM**. The search for a practical exposure equalization method in mammography. Grand Rounds, University of Michigan Department of Radiology, April 23, 1998.
16. **Goodsitt MM**. CT Physics Registry Review. A review of CT physics for x-ray technologists taking their registry examination. Sponsored by the Michigan Society of Radiation Technologists (MSRT). Midland MI, September 26, 1998.
17. **Goodsitt MM**. Radiation Safety – a 1 hour lecture for neuroangiography faculty and fellows at the University of Michigan Hospital, Nov 3, 1999
18. **Goodsitt MM**, The Physics of CT and Angiography – a 1 hour lecture for Neuroangiography faculty and fellows at the University of Michigan Hospital, Nov. 17, 1999.
19. Chan HP, **Goodsitt MM**, Sullivan JM, Darner KL, Hadjiiski LM. Depth perception in digital stereoscopic mammography. Presented at the Department of Defense Breast Cancer Research Program: Era of Hope. June 8-12, 2000, Atlanta Georgia.
20. **Goodsitt M**, Christodoulou E, Strouse P, Chien A, Platt J, Kazerooni E. Radiation Doses for Corresponding CT and Radiographic/Fluoroscopic Exams. Presented in a Symposium entitled Multislice CT vs. Radiography Debate at the 44th Annual Meeting of the American Association of Physicists in Medicine in Montreal, Quebec, Canada, July 14-18, 2002. (Medical Physics 2002;29:1298)

21. **Goodsitt MM.** Automated Stereo Spot Mammography for Improved Imaging of Dense Breasts. Presented in a Symposium entitled Digital Imaging: Diagnostic Potential and Enhancing Availability at the Era of Hope, Department of Defense Breast Cancer Research Program Meeting in Orlando, Florida, September 25-28, 2002. Page 30 of Program.
22. **Goodsitt MM.** What's new in CT Research. 1 hour symposium presented to University of Michigan Radiology residents on February 20, 2003.
23. **Goodsitt MM.** What's New in X-ray Imaging Research. A 1 hour lecture presented in Professor Kim Kearfott's Nuclear Engineering and Radiological Sciences 211 class (Introduction to Nuclear Engineering and Radiological Sciences) at the University of Michigan, April 11, 2003
24. **Goodsitt MM, Chan HP.** Developments in Digital Stereomammography. Presented in a symposium entitled DR Advanced Applications at the 45<sup>th</sup> Annual Meeting of the American Association of Physicists in Medicine in San Diego, CA. August 11, 2003 (Medical Physics 2003; 30: 1370).
25. **Goodsitt MM.** Digital Mammography: Risks, Benefits, QC and Applications. A 1 hour lecture presented at the Ninth International Radiological Technology and QA Conference/Workshop in Taiwan **at the Tung's Taichung MetroHarbor Hospital, Taichung, Taiwan, August 26<sup>th</sup>, 2006**
26. **Goodsitt MM.** Digital Mammography: Risks, Benefits, Regulations and Applications. A 1 hour lecture presented to Physicists, Radiologists and Radiation Oncologists at the **Sun Yat-Sen Cancer Center, Taipei, Taiwan August 28<sup>th</sup>, 2006**
27. **Goodsitt MM.** Digital Mammography: Risks, Benefits, Regulations and Applications. A 1 hour lecture presented to Radiologists at the **Women's Health Center, Department of Radiology, Taipei City Hospital, Taipei, Taiwan August 28<sup>th</sup>, 2006**
28. **Goodsitt MM.** Anatomy of Fluoroscopy Equipment, 1 hour lecture presented at the International Atomic Energy Agency (**IAEA**) Regional Training Course for Doctors (non-radiologists, non-cardiologists) using Fluoroscopy, November 4-5, 2007 **In Dubai, UAE.**
29. **Goodsitt MM.** Patient Dose Management in Fluoroscopic Examinations, 45 minute lecture presented at the International Atomic Energy Agency (**IAEA**) Regional Training Course for Doctors (non-radiologists, non-cardiologists) using

Fluoroscopy, November 4-5, 2007 **In Dubai, UAE.**

30. **Goodsitt MM.** Specific Issues in Urology, Gynecology & Gastroenterology, 1 hour lecture presented at the International Atomic Energy Agency (**IAEA**) Regional Training Course for Doctors (non-radiologists, non-cardiologists) using Fluoroscopy, November 4-5, 2007 **In Dubai, UAE.**
31. **Goodsitt MM.** Occupational Protection and Protective Devices, 1 hour lecture presented at the International Atomic Energy Agency (**IAEA**) Regional Training Course for Doctors (non-radiologists, non-cardiologists) using Fluoroscopy, November 4-5, 2007 **In Dubai, UAE.**
32. **Goodsitt MM.** CT Dose and Radiation Safety for the CT Technologist, a 40 minute lecture presented at the 4<sup>th</sup> Annual University of Michigan Medical School Department of Radiology Cardiac and Vascular CT & MR Imaging Symposium at The Inn at St. John's, Plymouth Michigan, October 24, 2008.
33. **Goodsitt MM,** Radiation Safety for Vascular Surgeons and Interventional Radiologists, a 1 hour lecture presented at the University of Michigan Cardiovascular Center, September 11, 2009.
34. **Goodsitt MM,** Radiation Safety for Vascular Surgeons and Interventional Radiologists, a 1 hour lecture presented at the University of Michigan Cardiovascular Center, September 11, 2009.
35. **Goodsitt MM,** CT Radiation Safety for Pediatric Radiologists, a 1 hour lecture presented at Mott Children's Hospital September 17, 2009.
36. **Goodsitt MM,** Radiation Safety for Vascular Surgeons and Interventional Radiologists, a 1 hour lecture presented at the University of Michigan Cardiovascular Center, August 24, 2010.
37. **Goodsitt MM,** CT Physics – the Basics, a 1 hour lecture presented to the Vascular Surgeons at the University of Michigan Cardiovascular Center, August 31, 2010.
38. **Goodsitt MM,** CT Radiation Safety for Pediatric Radiologists, a 1 hour lecture presented at Mott Children's Hospital September 10, 2010.
39. **Goodsitt MM,** Radiation Safety in Diagnostic Radiology including Highlights related to my Career, Grand Rounds Presentation to the Radiology Department (1 hr), December 8, 2010

40. **Goodsitt MM**, CT Radiation Safety for Pediatric Radiologists, a 1 hour lecture presented at Mott Children's Hospital October 14, 2011.
41. **Goodsitt MM**, CT Radiation Safety for Pediatric Radiologists, a 1 hour lecture presented at Mott Children's Hospital October 15, 2012.
42. **Goodsitt MM**, History, Theory and Operation of Digital Breast Tomosynthesis Systems, a 1 hour SAM session presented at the AAPM Spring Clinical Meeting, Phoenix, AZ, March 17, 2013
43. **Goodsitt MM**, CT Radiation Safety for Pediatric Radiologists, a 1 hour lecture presented at Mott Children's Hospital January 31, 2014.
44. **Goodsitt MM**, Radiation Safety for Pediatric Cardiologists a 1 hour lecture presented at Mott Children's Hospital March 20, 2014
45. **Goodsitt MM**, ACR Accreditation of Ultrasound Facilities a 1 hour lecture on Preparing for the Annual Report, also conducted six 30 minute lab sessions on Caliper Accuracy, Hands-on Ultrasound Physics Workshop, MTMI (Medical Technology Management Institute), A continuing education division of Herzing University, presented at Weber's Inn, Ann Arbor, May 17, 2014
46. **Goodsitt MM**, Writing good scientific papers and responding to critiques. Presented at the 2014 AAPM Annual Meeting, Austin, Texas, Medical Physics 2014: 41(6), 563.
47. **Goodsitt MM**, Writing good scientific papers and responding to critiques. Presented at the 2015 AAPM Annual Meeting, Anaheim, CA, Medical Physics 2015: 42(6), 3182.
48. **Goodsitt MM**, Radiation Safety for Pediatric Cardiologists a 1 hour lecture presented at Mott Children's Hospital June 17, 2016
49. **Goodsitt M**. TH-C-204-03: Writing Good Scientific Papers and Responding to Critiques. Med Phys. 2016 Jun;43(6):3868-3869. doi: 10.1118/1.4958122. Presented at the 2016 AAPM Annual Meeting, Washington DC, PMID:28048316
50. **Goodsitt MM**, Radiation Safety for Pediatric Cardiologists a 1 hour lecture presented at Mott Children's Hospital May 12, 2017
51. **Goodsitt MM**, Basic Ultrasound Physics (1 hour SAMS lecture) at the Hands-on Ultrasound Physics Workshop, MTMI (Medical Technology Management



Institute, a continuing education division of Herzing University). Presented at the Courtyard by Marriott, Ann Arbor, MI, June 9 and 10, 2017.

52. **Goodsitt MM**, Ultrasound QC Phantoms and tests ((1 hour SAMS lecture) at the Hands-on Ultrasound Physics Workshop, MTMI (Medical Technology Management Institute, a continuing education division of Herzing University). Presented at the Courtyard by Marriott, Ann Arbor, MI, June 9 and 10, 2017.
  
53. **Goodsitt MM**, Basic Ultrasound Physics (.5 hour SAMS lecture) at the Hands-on Ultrasound Physics Workshop, MTMI (Medical Technology Management Institute, a continuing education division of Herzing University). Presented at the Courtyard by Marriott, Ann Arbor, MI, June 1 and 2, 2018.
  
54. **Goodsitt MM**, Ultrasound QC Phantoms and tests ((1.5 hour SAMS lecture) at the Hands-on Ultrasound Physics Workshop, MTMI (Medical Technology Management Institute, a continuing education division of Herzing University). Presented at the Courtyard by Marriott, Ann Arbor, MI, June 1 and 2, 2018.