

CURRICULUM VITAE

Michael I. Miga, PhD
Professor of Biomedical Engineering
Professor of Radiology and Radiological Sciences
Professor of Neurological Surgery
April 26, 2015

EDUCATION:

- **Bachelor of Science in Mechanical Engineering with Applied Mechanics**, University of Rhode Island, Department of Mechanical Engineering, Kingston, RI. 1987-1992.
- **Master of Science in Mechanical Engineering with Applied Mechanics**, University of Rhode Island, Department of Mechanical Engineering, Kingston, RI. 1992-1994.
- **Doctor of Philosophy in Engineering**. Dartmouth College, Thayer School of Engineering, Hanover, NH. 1994-1998.

PROFESSIONAL EXPERIENCE:

- **Contracting Engineer**, Naval Undersea Warfare Center (NUWC), Newport, RI. 5/1991 – 8/1994.
 - Involved in construction, testing, and data analysis of quarter-scale countermeasure launchers
 - Designed an optimally controlled launch profile for experimental countermeasure launchers using convex optimization techniques
- **Research Associate Scientist** (Post doctoral training), Dartmouth College, Thayer School of Engineering, Hanover, NH. 10/1998-3/2000.
 - Continued dissertation-related research regarding biomechanical model of surgically-induced brain deformation
 - Computationally efficient strategies for simulating retraction, and resection of brain tissue and tested within an *in vivo* porcine system
- **Research Assistant Professor of Engineering**, Dartmouth College, Thayer School of Engineering, Hanover, NH. 4/2000-11/2000.
 - Continued research with brain biomechanics group
 - Novel algorithm for source localization within epilepsy patients
 - Time-varying elastodynamic wave models and harmonic wave models for the study of magnetic resonance elastography
- **Assistant Professor of Biomedical Engineering**, Vanderbilt University, Department of Biomedical Engineering, Nashville, TN. 12/2000-12/2007.

- **Assistant Professor of Radiology and Radiological Sciences**, Vanderbilt University Medical Center, Department of Radiology, Nashville, TN. 1/2006–4/2009.
- **Associate Professor of Radiology and Radiological Sciences**, Vanderbilt University Medical Center, Department of Radiology, Nashville, TN. 5/2009–7/2013.
- **Associate Professor of Neurological Surgery**, Vanderbilt University Medical Center, Department of Neurological Surgery, Nashville, TN. 7/2009–5/2013.
- **Professor of Biomedical Engineering**, Vanderbilt University, Department of Biomedical Engineering, Nashville, TN. 5/2013-present.
 - Co-Founder of Vanderbilt initiative in Surgery and Engineering (ViSE)
 - Director of the Biomedical Modeling Laboratory
 - Novel intraoperative laser range scanner and scanning data acquisition methodology for use in image-guided brain, liver, breast and kidney surgery
 - Novel algorithms for cortical surface registration, brain deformation measurements, and deformation correction for image-guided brain, liver, breast, and kidney surgery
 - Novel elastographic methods in breast, skin, liver, kidney, and bone tissue systems (Modality Independent Elastography)
 - Radio-frequency ablation models and optimization techniques for optimal probe placement
 - Finite element deformation model for kidney surgical simulation
 - Novel mechanical assay(s) to assess changes in mechanical properties for: (1) murine liver under varying conditions of chemically-induced liver fibrosis, and (2) murine breast tumor models.
 - Biomechanical testing methodology to assess callous formation in murine fracture healing process
 - Model-based analysis to perform optimal deep brain stimulation
 - Image-guided breast surgery approaches
 - Investigating the use of co-registered ultrasound within the workflow of image-guided procedures to include strain imaging
 - Tumor growth model for use in monitoring breast cancer chemotherapies
 - Examining the role of mechanical properties associated with breast cancer chemotherapies
 - Modeling aspiration strategies with novel robotic platform
 - Consulted on the development of cardiac bidomain models
- **Professor of Neurological Surgery**, Vanderbilt University Medical Center, Department of Neurological Surgery, Nashville, TN. 5/2013-present.
- **Professor of Radiology and Radiological Sciences**, Vanderbilt University Medical Center, Department of Radiology & Radiological Sciences, Nashville, TN. 8/2013-present.

OTHER EXPERIENCE:

- **Primary Leadership Development Course (PLDC)**, Fort Benning, GA, 6/1990.
- **Persian Gulf War Veteran (Operation Desert Shield & Operation Desert Storm)**, 443rd Civil Affairs Company attached to 414th Civil Affairs Company, U.S. Army, Warwick RI. Served in Saudi Arabia and Iraq - Activated: 12/1990-04/1991 – Total Enlistment: 2/1987-2/1995.
- **Vanderbilt University Institute for Imaging Science (VUIIS) Investigator**, Vanderbilt University Medical Center, Nashville, TN. 6/2003-present
- **Vanderbilt Institute for Integrative Biosystem Research and Education (VIBRE) Investigator**, Vanderbilt University, Nashville, TN. 1/2005-present
- **Co-Founder of Pathfinder Therapeutics Inc.**, 2969 Armory Dr., Suite 100A, Nashville, TN. (<http://www.pathfindertherapeutics.com>) 5/2004 – 12/2014.
- **Conference Chairman of SPIE Medical Imaging 2007, 2008, 2009, 2010: Visualization, Image-Guided Procedures, and Modeling Conference**, Orlando, FL, 2008.
- **Charter Member of NIH Biomedical Imaging Technology Study Section**, Washington, DC. 10/2010-6/2014
- **Co-Founder of Vanderbilt initiative in Surgery and Engineering Center (ViSE)**, Nashville, TN (3/2011)
- **Seminar Chair for the Vanderbilt initiative in Surgery and Engineering (ViSE) Center**, Nashville, TN (5/2011-present)
- **Associate Editor of *Journal of Medical Imaging***, (9/2013-present)
- **Programmatic Member of the Vanderbilt-Ingram Cancer Center (VICC), Host-Tumor Interactions Research Program**, Nashville, TN (8/2014-present)

AWARDS:

- **Army Commendation Medal** for meritorious service during *Operation Desert Shield & Operation Desert Storm*, 414th Civil Affairs Company, 1991.
- **Alma Hass Milhaum Fellowship in Biomedical Engineering**, Dartmouth College, Thayer School of Engineering, Hanover, NH. 1996-1997.
- **Thayer School Distinguished Fellow**, Dartmouth College, Thayer School of Engineering, Hanover, NH. 1997-1998.

- **Charles F. and Ruth D. Goodrich Prize**, Dartmouth College, Thayer School of Engineering, Hanover, NH. 1998.
- **Cum Laude: Medical Imaging 2003 Poster Award**, M. I. Miga and B. K. Lamprich, Vanderbilt University, Department of Biomedical Engineering, Nashville, TN. 2003.
- **Cum Laude: Medical Imaging 2006 Poster Award**, C. R. Chen, M. I. Miga and R. L. Galloway, Vanderbilt University, Department of Biomedical Engineering, Nashville, TN. 2003.
- **Cum Laude: Medical Imaging 2012 Poster Award**, M. J. Shannon, I. M. Meszoely, T. S. Pheiffer, A. L. Simpson, K. Sun, J. E. Ondrake, and **M. I. Miga**, Vanderbilt University, Department of Biomedical Engineering, Nashville, TN. 2011.
- **American Institute for Medical and Biological Engineering Fellow**, March 2014.

MEMBERSHIPS:

- Society of Photo-Optical Instrumentation Engineers (SPIE)
- Institute of Electronic and Electrical Engineers (IEEE) – Engineering and Medicine and Biology Society
- Biomedical Engineering Society (BMES)

SERVICE WORK:

VANDERBILT SERVICE WORK:

- **DEPARTMENT:**
 - Graduate Program Committee for Department of Biomedical Engineering (2000-present)
 - High Performance Computing Representative for Biomedical Engineering Department (2001)
 - Graduate Faculty Assembly Delegate
 - Core Undergraduate Curriculum Committee
 - Faculty Recruitment Committee for Imaging Initiative – Hires: John C. Gore, Adam W. Anderson, and Mark D. Does
 - Member of Graduate Education Committee for Strategic Planning Committee
 - Chair of Visibility and Outreach Committee for Strategic Planning Committee (2006)

- Primary Faculty Advisor for Biomedical Engineering Society Student Chapter (2006-present)
 - Faculty Advisor and Editor for Biomedical Engineering Newsletter (2006-present)
 - **ABET Coordinator (2008-2014) –Site Visit Leader**
 - Faculty Recruitment Committee (Chair: A. Mahadevan-Jansen) – Hires: H. J. Sung, C. J. Duvall, W. D. Merryman, and M. Skala
 - BME Representative for Vanderbilt initiative in Surgery and Engineering – ViSE (5/2011- present)
 - **Chair & Organizer of ABET Review Conference 2011, 2012, 2013, 2014**
 - Faculty Recruitment Committee Chair for Surgery/Engineering (2012-2013) – Hire: Brett Byram
 - Faculty Advisor to Undergraduate BMES Student Society, Vanderbilt University, Department of Biomedical Engineering, Nashville, TN. 9/2007-2012.
 - Faculty Director to BMEPulse Student Newsletter, Vanderbilt University, Department of Biomedical Engineering, Nashville, TN. (9/2008-present, <http://engineering.vanderbilt.edu/bme/bme-pulse.php>)
 - Reappointment Dossier Review Committee Chair for BME Faculty (2011)
 - Chair of Strategic Planning Committee: 'Big Idea' Committee Chair
 - Faculty Recruitment Committee Chair for Surgery/Engineering (2014-present) – Hire: In progress
- **SCHOOL OF ENGINEERING:**
 - Brain Institute Representative from Biomedical Engineering Department
 - Member of Biomath Study Group at Vanderbilt University
 - Member of Collaboration to Solve Biological Problems Using Computational & Informatics Tools Committee (Lee E. Limbird, PhD, Associate Vice Chancellor for Research), 12/4/2002.
 - Member of the Physics Shop Committee (2000-2010)
 - Member of the School of Engineering Shop Committee (2000-2010)
 - ACCRE Study Group (2000-present)
 - Vanderbilt University School of Engineering Career Committee (2008-present)
 - Vanderbilt University School of Engineering Website Committee (2008-present)
- **UNIVERSITY:**
 - Early Acceptance Program for Vanderbilt University Medical School (2003-2010)
 - PAVE Lecture Series for BME –(2004-2010)
 - Member of Board of Appeals Board for Student Honor Council (2008-2010)
 - Member of Board of Faculty Advisors to Student Honor Council (2006-present)

- Member of Exploratory Committee for Vanderbilt initiative in Surgery and Engineering (2010-present)
 - Organizer of Vanderbilt Initiative for Surgery and Engineering Summer Research Series (2011-present)
 - Organizer of the 1st and 2nd Annual Surgery & Engineering Mini-symposium and Poster Session (2012, 2013)s
 - Reviewer for Vanderbilt Institute for Clinical and Translational Research Grant Review Studio (2012).
 - Member of Conflict of Interest Working Group, Chair: Alison R. Cooper (2011-present)
 - Member of sub-committee for Conflict of Interest Scientific Review, Chair: Christy Hooper (2011-present)
 - Tenure Dossier Review Letter Writer
- **CROSS-SCHOOL SERVICE WORK:**
 - Vanderbilt initiative in Surgery and Engineering Building Committee (2011-present)
 - Vanderbilt initiative in Surgery and Engineering Steering Committee (2015-present)
 - Vanderbilt initiative for Surgery and Engineering Seminar Chair, 2012 (see below list of speakers – each speaker is recruited by me, and arranged itinerary. Note speakers without affiliation are Vanderbilt University or Vanderbilt University Medical Center speakers).

Summer Research Series 2011 Organizer:

Seminar - May 24, 2011 - Speakers: Robert L. Galloway PhD, Benoit M. Dawant PhD, Michael I. Miga PhD.

Seminar - June 9, 2011 - Speakers: Keith Obstein MD, Ishita Chen PhD.

Seminar - June 23, 2011 - Speakers: Louise Mawn MD, and D. Caleb Rucker PhD.

Seminar - July 7, 2011 - Speakers: Alan Bentley, and Andrea Bajo.

Seminar - July 28, 2011 - Speakers: Robert Labadie MD, and Jack Noble PhD.

August 2, 2011 - Speakers: Joseph Neimat MD & Srivatsan Pallavaram PhD

August 16, 2011 - Speakers: Robert J. Webster PhD, Pietro Valdastri PhD, & Nabil Simaan PhD.

Fall Seminar Series 2011 Organizer:

September 28, 2011 - Speakers: Pratik Patel, BrainLab & Quick Overview of Some Vanderbilt Guidance Work

November 3, 2011 - Speakers: Tara Helmer, Lesa Black. Vanderbilt Institute for Clinical Translational Research (VICTR)

December 12, 2011 - Speaker: Professor Alexandra Golby, MD - Department of Neurosurgery, Harvard Medical School, Brigham & Women's Hospital

Spring Seminar Series 2012 Organizer:

Seminar – January 17, 2012 - Speakers: Dr. Seth Karp, MD & Dr. Jessica Burgner, PhD

Seminar – January 31, 2012 – Speaker: Dr. Joerg Raczekowsky, PhD, Karlsruhe Institute of Technology

Seminar – February 16, 2012 - Speakers: Dr. Luke Tomycz, MD & Dr. Amanda K. Buck, PhD

Seminar – February 28, 2012 - Speakers: Dr. Ben Poulouse, MD & Dr. Bennett Landman, PhD

Seminar – March 27, 2012 - Speaker: Dr. Mark Rentschler, PhD – University of Colorado

Seminar – March 29, 2012 - Speaker: Dr. Ron Alterovitz, PhD – University of North Carolina

Seminar – April 18, 2012 - Speaker: Jeff Siewerdsen, PhD – Johns Hopkins University

Instructional Summer Research Series 2012 Organizer:

Seminar - June 14, 2012 - Speaker: Ramya Balachandran, PhD. (Medical Image Registration)

Seminar - June 28, 2012 - Speaker: Amber Simpson, PhD. (Intraoperative Digitization & Image-to-Physical Registration)

Seminar - July 6, 2012 - Speaker: Nassir Navab, PhD. (Guest Speaker)

Seminar - July 12, 2012 - Speakers: Sri Pallavaram PhD., and Jack Noble, PhD. (Image-to-Image Registration & Image Segmentation)

Seminar - July 26, 2012 - Speaker: Jessica Burgner, PhD.. (Interventional Mechnronic Devices)

Seminar - August 9, 2012 - Speakers: Kay Sun, PhD and D. Caleb Rucker, PhD (Modeling & Optimization for Intervention)

Fall Seminar Series 2012 Organizer:

Seminar - September 10, 2012 - Speaker: Dr. Gerard Ateshian, Columbia University.

Seminar - September 27, 2012 - Speakers: Ingrid Meszoely, MD & Mike Miga, PhD

Seminar - October 18, 2012 - Speakers: Ginger Holt, and Xiaohong Bi

Seminar - November 1, 2012 - Speakers: Drs. Reid Thompson, MD & Victoria Morgan, PhD

Seminar - November 15, 2012 - Speaker: Dr. Elisa Konofagou, PhD - Columbia University

1st Vanderbilt Surgery & Engineering Symposium - December 12, 2012 - Speaker: Dr. Reed Omary, MD - Chair of Radiology, VUMC

Spring Seminar Series 2013 Organizer:

Seminar – January 18, 2013 - Speaker: Dr. Kevin Cleary, PhD, Technical Director, Sheikh Zayed Institute for Pediatric Surgical Innovation.

Seminar – February 7, 2013 - Speakers: Keith Obstein, MD and Pietro Valdastrì, PhD

Seminar – February 21, 2013 - Speakers: Noel Tulipan, MD & Virginia Pensabene, PhD

Seminar – March 14, 2013 - Speaker: James Duncan, PhD - Yale University.

Seminar – March 28, 2013 - Speakers: Ted Anderson, MD, and Will Grissom, PhD

Seminar – April 11, 2013 – Speakers: Ben Poulouse, MD, and Bennett Landman, PhD

Seminar – April 25, 2013 – Speaker: Barbara Gibson, Regulatory Affairs Office

Seminar – April 30, 2013 – Speakers: Duke Herrell, MD and Bob Webster, PhD

Seminar – May 2, 2013 – Speakers: Medical Visualization Student Presentations

Instructional Summer Research Series 2013 Organizer:

Seminar – May 30, 2013 - Speakers: Bernard Rousseau, PhD, and Haoxiang Luo, PhD

Seminar – June 13, 2013 - Speaker: Melissa Skala, PhD, Robert J. Webster, PhD, & Michael I. Miga, PhD.

Seminar – June 27, 2013 - Speakers: Lola B. Chambless, MD

Seminar – July 9, 2013 – Speakers: John C. Pope, MD

Seminar – April 25, 2013 – Speaker: J. Mocco, MD

Seminar – April 30, 2013 – Speakers: Dzung Pham, PhD, NIH

Seminar – May 2, 2013 – Speakers: Frank Aguirre, MD

Fall Seminar Series 2013 Organizer:

Seminar - August 29, 2013 - Speakers: Richard J. Gumina, MD & David W. Merryman, PhD

Seminar - September 5, 2013 - Speaker: Noby Hata, PhD – Brigham and Women's Hospital, Harvard Medical School

Seminar – September 19, 2013 - Speaker: Robert Howe, PhD – Harvard University

Seminar – October 7, 2013 - Speaker: Russ Taylor, PhD – Johns Hopkins University

Seminar – October 31, 2013 - Speakers: Evan L. Brittain, MD, and Brett Byram, PhD.

Seminar – November 21, 2013 - Speakers: Daniel B. Brown, MD & Logan W. Clements, PhD

2nd Vanderbilt Surgery & Engineering Symposium - December 11, 2013 - Speaker: Dr. Nick Hopkins, MD - Chair of Neurosurgery, State University of New York at Buffalo

Spring Seminar Series 2014 Organizer:

Seminar - January 27, 2014 - Speakers: Eric C. Luethardt, MD, Washington University School of Medicine

Seminar – February 13, 2014 - Speaker: Tommy Wang, MD

Seminar – February 27, 2014 - Speaker: Otis Rickman, DO & Bob Webster, PhD

Seminar – March 13, 2014 - Speaker: Warren Grill, PhD – Duke University

Seminar – March 27, 2014 - Speakers: William Nealon, MD, & Charles Caskey, PhD

Seminar – April 17, 2014 - Speakers: Simon Warfield, PhD – Harvard Medical School, Children’s Hospital, Boston, MA

Summer Seminar Series 2014 Organizer:

Seminar – June 12, 2014 - Speakers: Richard Hendrick, PhD candidate – 2 years completed, Zhoubing Xu, PhD candidate – 3 years completed

Seminar – June 26, 2014 - Speaker: Rebekah Conley – 2 years completed, Michael I. Miga, PhD – guest seminar

Seminar – July 11, 2014 - Speaker: Carolyn K. Novaleski, PhD candidate – 2 years completed, Siyuan Chang, PhD candidate – 3 years completed

Seminar – July 24, 2014 - Speaker: Kepra McBrayer – 1 year completed, Yifei Wu, PhD candidate – 3 years completed

Seminar – August, 7, 2014 - Speakers: Neal Dillon, PhD candidate – 3 years completed, Yiyuan Zhao, PhD candidate – 3 years completed

Seminar – August 19, 2014 - Speakers: Michael I. Miga, PhD – NIH grant writing and review workshop follow-up to June 26th seminar

Seminar – August 21, 2014 - Speakers: Bob Webster, PhD & Jack Noble, PhD – Workshop for Pre-Doc grant opportunities

Fall Seminar Series 2014 Organizer:

Seminar – September 11, 2014 - Speakers: Christopher L. Brace, PhD - University of Wisconsin

Seminar – September 25, 2014 - Speakers: Mayur B. Patel, MD & Andrew J. Plassard, PhD Cand. EECS

Seminar – October 9, 2014 - Speaker: Cenk Cavusoglu, PhD – Case Western University

Seminar – October 23, 2014 - Speaker: Bill Higgins, PhD – Pennsylvania State University

Seminar – November 11, 2014 - Speakers: Eric Grogan, MD, & Phil Swaney, PhD cand. ME

3rd Annual Surgery & Engineering Symposium & Poster Session – December 10, 2014 - Speaker: Robert M. Sweet, MD – University of Minnesota

Spring Seminar Series 2015 Organizer:

Seminar – January 8, 2015 – Speaker: Lucas H. Timmins, PhD, Georgia Institute of Technology & Emory University, Department of BME

Seminar – January 13, 2015 – Speaker: Gian-Luca Mariottini, PhD, University of Texas at Arlington, Department of Computer Science & Engineering

Seminar – January 15, 2015 – Speaker: Wei Wang, PhD, Harvard Medical School, Departments of Radiology & Radiation Oncology

Seminar – January 22, 2015 – Speaker: Michael Sano, PhD, Stanford University, Departments of Radiation Physics

Seminar – January 27, 2015 – Speaker: Hong Chen, PhD, Columbia University, Departments of Biomedical Engineering

Seminar – March 12, 2015 – Speaker: Albert Attia, MD, Vanderbilt University Medical Center, Departments of Radiation Oncology

Seminar – March 26, 2015 – Speaker: Karl Zelik, PhD, Vanderbilt University, Departments of Mechanical Engineering

FORMER UNIVERSITY SERVICE WORK:

- Faculty/Student Adviser of the IEEE Engineering in Medicine and Biology Society Chapter, Dartmouth College, Thayer School of Engineering, Hanover, NH. 1/1995-11/2000.
- Faculty Mentor for the Women in Science Program, Dartmouth College, Thayer School of Engineering, Hanover, NH. 1/2000-6/2000.

SCIENTIFIC COMMUNITY SERVICE WORK:

- **SOCIETY WORK:**

- IEEE Engineering Medicine and Biology Society Chapter, Chair of Central Tennessee Section, 2006, 2007, 2008, 2009, 2010, 2011

- **MANUSCRIPT REVIEW:**

- Reviewed Book Proposals from Oxford University Press
- Reviewer for *IEEE Trans. on Medical Imaging*
- Reviewer for *IEEE Trans. On Biomedical Engineering*
- Reviewer for *Medical Image Analysis*
- Reviewer for *Medical Physics*
- Reviewer for *Int. Journal for Numerical Methods in Engineering*
- Reviewer for *Journal of Biomechanics*
- Reviewer for *Ultrasound in Medicine & Biology*
- Reviewer for *Magnetic Resonance in Medicine*

- **EDITOR WORK:**

- Associate Editor of *Journal of Medical Imaging* (9/2013-present)
- Associate Editor of *Journal of Medical Robotics Research* (1/2015-present)

- **CONFERENCE LEADERSHIP ACTIVITIES:**

- Member of Program Scientific Review Committee for 4th International Conference on Medical Image Computing and Computer-Assisted Intervention, 2001.

- Member of Program Scientific Review Committee for 5th International Conference on Medical Image Computing and Computer-Assisted Intervention, 2002.
- Member of Program Scientific Review Committee for International Symposium on Surgery Simulation and Soft Tissue Modeling Reviews, 2003.
- Session Chair & Scientific Committee for SPIE Medical Imaging 2003: Visualization, Display and Image-guided Procedures, 2/15-18/2003.
- Member of Program Scientific Review Committee for 6th International Conference on Medical Image Computing and Computer-Assisted Intervention, 2003.
- Session Chair & Scientific Committee for SPIE Medical Imaging 2004: Visualization, Display and Image-guided Procedures, 2004.
- Member of Program Scientific Review Committee for 7th International Conference on Medical Image Computing and Computer-Assisted Intervention, 2004.
- Session Chair & Scientific Committee for SPIE Medical Imaging 2005: Visualization, Display and Image-guided Procedures, 2005.
- Academic Representative for SPIE Medical Imaging 2005: Student Networking Reception, 2005.
- Organized the Submission of Conference Hosting Proposal for the 10th International Conference on Medical Image Computing and Computer-Assisted Intervention – MICCAI 2007, 9/14/2004, (not awarded).
- Member of Program Scientific Review Committee for 8th International Conference on Medical Image Computing and Computer-Assisted Intervention, 2005.
- Session Chair & Scientific Committee for SPIE Medical Imaging 2006: Visualization, Display and Image-guided Procedures, 2006.
- Short Course for SPIE Medical Imaging 2006: Image-Guided Procedures and Computer Aided Surgery
- Member of Program Scientific Committee for 3rd Symposium on Biomedical Simulation, 2006.
- Member of Program Scientific Review Committee for 9th International Conference on Medical Image Computing and Computer-Assisted Intervention, 2006.
- Chairman of SPIE Medical Imaging 2007: Visualization, Display and Image-guided Procedures Conference, 2007.
- Chairman of SPIE Medical Imaging 2008: Visualization, Image-Guided Procedures, and Modeling Conference, 2008.
- Chairman of SPIE Medical Imaging 2009: Visualization, Image-Guided Procedures, and Modeling Conference, 2009.
- Chairman of SPIE Medical Imaging 2010: Visualization, Image-guided Procedures, and Modeling Conference, 2010.
- Session Chair & Scientific Committee for SPIE Medical Imaging 2011: Visualization, Image-guided Procedures, and Modeling Conference, 2011.
- Member of Program Scientific Review Committee for 14th International Conference on Medical Image Computing and Computer-Assisted Intervention, 2011.

- Session Chair & Scientific Committee for SPIE Medical Imaging 2012: Image-guided Procedures, Robotic Interventions, and Modeling Conference, 2012.
 - Session Chair & Scientific Committee for SPIE Medical Imaging 2013: Image-guided Procedures, Robotic Interventions, and Modeling Conference, 2013.
 - Member of Program Scientific Review Committee for 16th International Conference on Medical Image Computing and Computer-Assisted Intervention, 2014.
 - Session Chair & Scientific Committee for SPIE Medical Imaging 2014: Image-guided Procedures, Robotic Interventions, and Modeling Conference, 2014.
 - Member of Program Scientific Review Committee for 17th International Conference on Medical Image Computing and Computer-Assisted Intervention, 2015.
 - Session Chair & Scientific Committee for SPIE Medical Imaging 2015: Image-guided Procedures, Robotic Interventions, and Modeling Conference, 2015.
- **STUDY PANEL ACTIVITIES:**
 - Member of NSF-SBIR Panel on Imaging and Computational Bioengineering, 5/23-26/2002
 - Member of NSF-SBIR Panel on Imaging and Computational Bioengineering, 4/09-10/2003
 - Member of NIH-R01/R21/R33/R03 Panel on Biomedical Imaging Technology (BMIT), 6/7-6/8/2004
 - Member of NIH-NCI-P01 Panel Site Review on Image Guided Therapy Cluster Review, 2/3/2005
 - Member of NIH-R01/R21/R33/R03 Panel on Biomedical Imaging Technology (BMIT), 6/6-6/7/2005
 - Member of NIH-NCI-Scientific Review Group: Image Guided Therapy Cluster Review, 9/26-27/2005
 - Member of NIH-R01/R21/R33/R03 Panel on Biomedical Imaging Technology (BMIT), 2/4/2006
 - Member of NIH-R01 Panel on Development and Maintenance of Software, PAR-PAR 05-057, 9/17/2006
 - Member of NIH-R21 Panel on Innovative Ultrasound and Imaging, ZRG1 SBIB-U, 6/12/2007
 - Member of NIH-R01/R21/R33/R03 Panel on Biomedical Imaging Technology (BMIT), 10/5/2008
 - Member of NIH-R01/R21/R33/R03 Panel on Biomedical Imaging Technology (BMIT), 2/1/2009 (mail-in)
 - Member of NIH-ZRG1 SBIB-U Panel on Academic-Industrial Partnership Panel, 2/18/2009
 - **Charter Member of NIH-R01/R21/R33/R03 Panel on Biomedical Imaging Technology (BMIT), 10/4/2010-9/30/2014 (4 year term)**

- Member of NIH-ZRG1 SBIB-Q 80 Recurring Special Emphasis Panel on Bioinformatics in Surgical Sciences, Imaging and Independent Living, 10/27/2014
- Member of NIH-ZRG1 SBIB-Q 80 Recurring Special Emphasis Panel on Bioinformatics in Surgical Sciences, Imaging and Independent Living, 02/06/2015
- Member of NIH-ZRG1 SBIB-Q 80 Recurring Special Emphasis Panel on Bioinformatics in Surgical Sciences, Imaging and Independent Living, 06/07/2015

MENTOR SERVICE WORK:

• **UNDERGRADUATE TEACHING AND ADVISING:**

- Taught *BME 101: Introduction to Biomechanics* for in Fall 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009 with enrollments of 47, 49, 47, 49, 48, 41, 35, 45, and 33 students, respectively.
- Taught *BME 279: Modeling Living Systems for Therapeutic Bioengineering* for Spring 2002, 2003, 2006, 2008, 2010, 2011 with enrollments of 7, 2, 20, 27, 9, and 13 students, respectively.
- Taught *BME 210: Physiological Transport Phenomena* for Fall 2011, 2012, 2013 with enrollments of 38, 28, and 76 students, respectively
- Guest lecture for *SC250: Scientific Computing Toolbox* by Dr. Bobby Bodenheimer, 9/2011, 9/2012, 9/2013.
- Biomedical Engineering Program Advisor
- Research Experience for Undergraduates Advisor, 2001: Brad Lamprich
- Vanderbilt University Summer Research Program Advisor 2001: Jordan Winston
- BME 240 undergraduate mentor for Bradley K. Lamprich, 'Analysis of Model-Updated MR Images to Correct for Brain Deformation Due to Tissue Retraction', 5/2002.
- Research Experience for Undergraduates Advisor, 2002: Hiromi Terawaki
- Research Experience for Undergraduates Advisor, 2002: Sanjay Patel
- Research Experience for Undergraduates Advisor, 2003: Colin Caughram
- BME 272, 273 undergraduate mentor for Joe Anderson, Anne Benincasa, Taylor Davis, Marlena Justak, and Alaina Kiefer, 'Elastography for Breast Cancer Screening and Monitoring', 5/2004.
- Vanderbilt University Summer Research Program Advisor, 2005: Daniel Schuler
- Research Experience for Undergraduates Advisor, 2005: Tanoy Sinha
- BME 272, 273 undergraduate mentor for Erica Bozeman, Markesha Cook, Stephanie Cruz, 'A Novel Dermoscopic Elastographic Probe', 5/2007.
- Research Experience for Undergraduates Advisor, 2009: Syahirah Abdul Rahman
- Research Experience for Undergraduates Advisor, 2010: Syahirah Abdul Rahman
- Research Experience for Undergraduates Advisor, 2010: George Waits

- BME 272, 273 undergraduate mentor for Megan Luh, Hao Luo, 'Knee Alignment Verification System Utilizing Visual Recognition', 5/2010.
- Research Experience for Undergraduate Advisor, 2011: Michael Shannon
- Research Experience for Undergraduates Advisor 2011: Kristin Miller – VUSRP, Jeimi Zhu – VUSES RP
- Research Experience Summer Advising 2012 – Samantha Munoz (Vanderbilt University) & Rahul Sastry (Stanford University)
- Research Experience for Undergraduate Advising 2014, 2015 – Katherine Flint (Vanderbilt University)

- **GRADUATE TEACHING AND ADVISING:**

- Taught *BME 301c (graduate core): Quantitative Methods in BME* for Fall 2009, 2010, 2011 with enrollments of 10, 16, and 19 students, respectively.
- Taught *BME 329 (formerly 395): Advanced Computational Modeling and Analysis in Biomedical Engineering* for Spring 2001, 2002, 2003, 2004, 2005, 2007, 2009, Fall 2011, 2013, 2014 with enrollments of 6, 3, 6, 13, 8, 7, 10, 6, 6 and 7 students, respectively.
- Guest lectured in *BME 318: Principles and Applications in Magnetic Resonance Imaging* taught by Dr. Cynthia Paschal, Spring 2002.
- Guest lecture series for *CS 395: Medical Image Registration* taught by Dr. J. Michael Fitzpatrick, Fall 2003.
- Post-Doctoral Trainee Mentor
 - Aize Cao, PhD, Nanyang Technological University, Singapore, 7/1/2005-2008 (PM)
 - Staff Computer Systems Analyst, Institute for Medicine and Public Health, Vanderbilt University, Nashville, TN
 - Prashanth Dumpuri, PhD, Vanderbilt University, Nashville, TN, 11/2007-2010 (PM)
 - Imaging Scientist, Perfint Healthcare Corporation, Florence, OR
 - Amber Simpson, PhD, Queen's University, Kingston, Ontario, CA, 11/2009-5/2012 (PM)
 - Assistant Attending Computer Scientist, Memorial Sloan Kettering Cancer Center, New York, NY.
 - D. Caleb Rucker, PhD, Vanderbilt University, Dept. of ME, Nashville, TN, 11/2011-7/2013 (PM)
 - Assistant Professor of Mechanical Engineering, University of Tennessee at Knoxville, Knoxville, TN.
 - Jared Weis, PhD, Vanderbilt University, Dept. of BME, Nashville, TN, 9/2011-present (PM)
 - Research Assistant Professor, Vanderbilt University BME, Nashville, TN, 1/2015-present.
 - L. Clements, PhD, Vanderbilt University, Dept. of BME, Nashville TN, 5/2013-present (PM)
 - Research Assistant Professor, Vanderbilt University BME, Nashville, TN, 5/2013-present.

- Primary Mentor (PM), Co-Primary Mentor (co-PM) , Co-Advisor (CA)
 - Leah Platenik, Dartmouth College, MS, 1/2001 (CA)
 - Tuhin K. Sinha, Vanderbilt University, MS, 12/2002 (PM)
 - Tuhin K. Sinha, Vanderbilt University, PhD, 10/2004 (PM)
 - Technical Project Director UCSF, Health eHeart Study, San Francisco, CA
 - Chad W. Washington, Vanderbilt University, MS, 8/2003 (PM)
 - PGY-7, Washington University School of Medicine, Department of Neurosurgery
 - Megan P. Rothney, Vanderbilt University, MS, 8/2004 (PM)
 - Associate Director of Biostatistics, Medical Affairs at Genomic Health, San Francisco, CA
 - David M. Cash, Vanderbilt University, PhD, 8/2004 (CA)
 - Senior Research Associate at Dementia Research Centre, Institute of Neurology, University College of London
 - Richard Chen, Vanderbilt University, PhD, 8/2006 (CA)
 - Resident, Department of Surgery, Washington University School of Medicine, St. Louis, MO
 - Stephanie L. Barnes, Vanderbilt University, MS, 5/2007 (PM)
 - Stephanie L. Barnes, Vanderbilt University, PhD, 8/2010 (PM)
 - Post-doctoral Fellow, Vanderbilt University Institute for Imaging Science, Vanderbilt University, Nashville, TN
 - Rowena Ong, Vanderbilt University, MS, 8/2007 (PM)
 - Senior Systems Engineer, Medtronic, Denver, CO
 - Prashanth Dumpuri, Vanderbilt University, PhD, 10/2007 (PM)
 - Imaging Scientist, Perfint Healthcare Corporation, Florence, OR
 - Jao Ou, Vanderbilt University, MD, PhD, 10/2007 (PM)
 - Resident, Department of Radiology, University of Louisville, Louisville, KY
 - Logan Clements, Vanderbilt University, PhD 10/2008 (CA)
 - Pathfinder Technologies, 1/2009-12/2014.
 - Research Assistant Professor, Vanderbilt University BME, Nashville, TN, 5/2013-present.
 - Aaron Coffey, Vanderbilt University, MS, 5/2010 (PM)
 - Post-doctoral Fellow, Vanderbilt University Institute for Imaging Science, Vanderbilt University, Nashville, TN
 - Sylvia Ding, Vanderbilt University, PhD, 12/2010 (co-PM)
 - Algorithm Engineer, KLA-Tencor Inc., Milpitas, CA
 - Jared Weis, Vanderbilt University, MS, 1/2011 (PM)
 - Jared Weis, Vanderbilt University, PhD, 8/2011 (PM)
 - Post-doctoral Fellow, Vanderbilt University Institute for Imaging Science, Vanderbilt University, Nashville, TN
 - Ishita Chen (formerly Garg), Vanderbilt University, PhD, 5/2012 (PM)
 - Medical Student, Washington University School of Medicine, St. Louis, MO

- Thomas Pheiffer, Vanderbilt University, MS, 12/2010(PM)
- Thomas Pheiffer, Vanderbilt University, PhD, 6/2014(PM)
 - Research Scientist at Siemens Corporate Technology, Princeton, NJ
- Janet Ondrake, Vanderbilt University, MS, 5/2012 (PM)
- Ankur Kumar, Vanderbilt University, PhD, 10/2014(co-PM)
 - Intelligent Computing Consultant, Accenture, Florham, NJ.
- Yifei Wu, Vanderbilt University, MS, 10/2013 (PM)
- Rebekah Conley, Vanderbilt University, MS, 5/2014 (PM)
- Jarrod Collins, Vanderbilt University, MS, 5/2015 (PM)
- Rebekah Conley, Vanderbilt University, PhD, 5/2017 (PM)
- Jarrod Collins, Vanderbilt University, PhD, 5/2018 (PM)
- Saramati Narasimhan, MS, 5/2016 (PM)
- Thesis Committee Member:
 - Elijah Van Houten, Dartmouth College, PhD, 7/2001
 - Steven L. Hartman, Vanderbilt University, PhD, 5/2002
 - Gwendolyn A. Banks, Vanderbilt University, MS, 8/2002
 - Zhujiang Cao, Vanderbilt University, PhD, 8/2004
 - Robert Palmer, Vanderbilt University, PhD, 5/2005
 - Krista McBride, Vanderbilt University, PhD, 6/2008
 - Marcella Woods, Vanderbilt University, PhD, 6/2005
 - Junkai Xu, Vanderbilt University, PhD, 6/2008
 - Anne Benincasa, Vanderbilt University, MS, 8/2006
 - Kweku Addae-mensah, Vanderbilt University, PhD, 5/2008
 - Ishita Garg, Vanderbilt University, MS, 8/2007
 - John M. Virostko, Vanderbilt University, PhD, 5/2006
 - Christine DeLorenzo, Yale University, PhD, 5/2007
 - Fenghong Liu, Dartmouth College, PhD, 8/2008
 - David Kwartowitz, Vanderbilt University, PhD 10/2008
 - Nkiruka Aguegwu, Vanderbilt University, PhD, 10/2008
 - Zohreh Barani Lonbani, University of Canterbury, MS, 8/2010
 - D. Caleb Rucker, Vanderbilt University, PhD, 9/2011
 - Rowena Ong, Vanderbilt University, PhD, 5/2012
 - Courtney Glisson, Vanderbilt University, PhD, 12/2014
 - Michael Delisi, Vanderbilt University, PhD, 5/2014
 - Joe Chen, Vanderbilt University, Ph.D, 5/2015
 - Ryan David Datteri, Vanderbilt University, PhD, 7/2014
 - Steven Boronyak, Vanderbilt University, PhD, 7/2015
- Staff Engineer Advising:
 - Doug Hackworth, MS, Vanderbilt University, 8/2007-7/2010
 - Kay Sun, PhD, Vanderbilt University, 8/2010-present
- **OTHER TEACHING AND ADVISING:**
 - Research Experience for Teachers Advisor, 2005: Luke Diamond
 - Research Experience for Teachers Advisor, 2005: Glenn Clay
 - Research Experience for Teachers Advisor, 2006: Luke Diamond
 - EMPHASIS Program Mentor for Medical Students, 2006-2007: Kevin Ha

- Research Experience for Teachers Advisor, 2007: Aubrey Anne McKelvey
- Research Experience for Teachers Advisor, 2008: Ray Henson, Jo Nola
- Research Experience for Teachers Advisor, 2009: Jo Nola
- Research Experience for Teachers Advisor, 2010: Michael Kiser
- Research Experience for Teachers co-Advisor, 2011: Bill Rodriguez
- Short Course: **M. I. Miga**, 'An introduction to finite elements for medical imaging', Medical Imaging 2007: Visualization, Image-guided Procedures, and Modeling Conference.
- Short Course: **M. I. Miga**, 'An introduction to finite elements for medical imaging', Medical Imaging 2008: Visualization, Image-guided Procedures, and Modeling Conference.
- Short Course: **M. I. Miga**, 'An introduction to finite elements for medical imaging', Medical Imaging 2009: Visualization, Image-guided Procedures, and Modeling Conference.
- Short Course: **M. I. Miga**, 'An introduction to finite elements for medical imaging', Medical Imaging 2010: Visualization, Image-guided Procedures, and Modeling Conference.
- 1-Day Workshop: M. S. Skala, R. J. Webster, and **M. I. Miga**, 'In Our Humble Opinions (IOHO): NIH Grant Tips, Experiences, & Review', ViSE Seminar Series, 6/2013.
- NIH Workshop: Chair (**M. I. Miga**) of Mock Study Section: Understanding the NIH Peer Review System Relative When Competing for Grant Awards, 2012, 2013, and 2014.
- Seminar: **M. I. Miga**, 'IMHO: NIH Review, Tips on Grantsmanship, & Updates', ViSE Seminar Series, 6/2014.

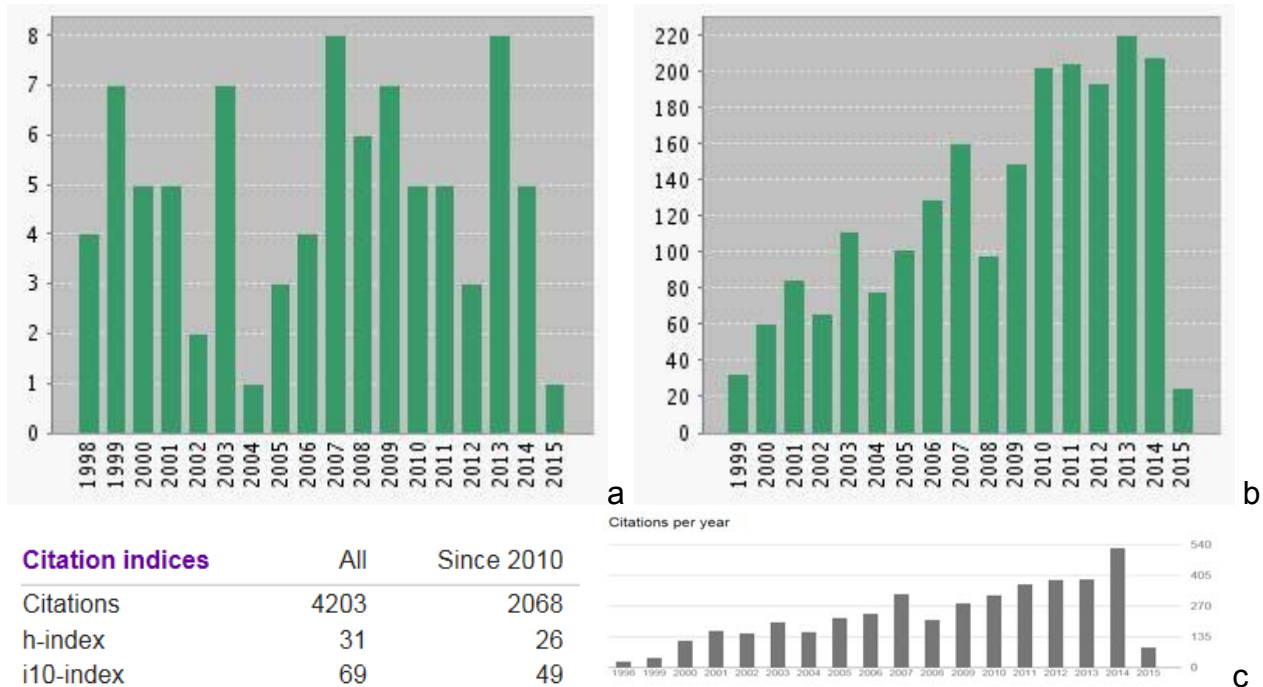
GRANT ACTIVITY:

- **FUNDED (Non-PI awards below have M. I. Miga's role as co-investigator):**
 - Whitaker Young Investigator Award (PI: Michael I. Miga), 'Modality Independent Elastography for Detection and Diagnosis of Breast Cancer', 12/1/2001-11/30/2004 (\$239,636).
 - Vanderbilt University Discovery Grant (PI: Michael I. Miga), 'Compensating for Intraoperative Brain Shift with Models', 6/1/2002-5/31/2005 (\$91,500).
 - NIH: R21 Exploratory/Development Grant (PI: William C. Chapman), 'Clinical Application of Image-Guided Liver Surgery', 6/1/2002-5/31/2003 (\$242,000).
 - NIH: R01 Investigator Initiated Award (PI: John P. Wikswow), 'Electrophysiological Implications of Cardiac Bidomain', 12/1/2002-11/30/2007 (\$2,100,261).
 - NIH: SBIR Small Business Innovation Research Grant (PI: David Kynor, CREARE, Inc.), 'Minimally Invasive Surgical Planning and Training System', 6/1/2003-5/31/2006 (\$850,000).
 - NIH: R33 Exploratory/Development Grant (PI: William C. Chapman), 'Clinical Application of Image-Guided Liver Surgery', 6/1/2003-5/31/2006 (\$726,000).

- NIH: T32 Training Grant (PI: John Gore), 'Predoctoral Training Program in Biomedical Imaging', 7/1/2004-6/30/2009 (\$1,374,480).
- NIH: 5R25CA092043 Training Grant (PI: Tom Yankeelov), 'Multidisciplinary Training in Basic and Translational Imaging of Cancer', 7/1/2001-6/30/2016 (\$2,171,500).
- Congressional Directed Medical Research Program Predoctoral Training Award (PI: Jao Ou, Primary Mentor: Michael I. Miga), 'Development of an Automatic Modality Independent Image Analysis System for Tumor Screening', 12/1/2004-09/30/2007 (\$90,000).
- Industrial Contract to Pathfinder Therapeutics (PI: Michael I. Miga), 'Laser Range Scanning for Image-Guided Liver Surgery', 11/1/2004-10/31/2005 (\$67,360).
- NIH: R01 Investigator Initiated Award (PI: Michael I. Miga), 'Multimodal Registration of the Brain's Cortical Surface', 4/30/2005-5/1/2008 (\$1,049,619).
- Whitaker Foundation Continuation Award (PI: Michael I. Miga), 'Modality Independent Elastography for Detection and Diagnosis of Breast Cancer', 2/1/2005-11/30/2005 (\$80,000).
- NSF Graduate Student Fellowship (PI: Stephanie Barnes, Primary Mentor: Michael I. Miga), 'Development of Tumor Modeling', 8/1/2005-7/31/2008 (\$90,000).
- NIH: R01 Investigator Initiated Award (PI: Benoit M. Dawant), 'Computer-assisted functional surgery', 6/1/2006-5/31/2010, (\$1,700,000).
- NIH: R21 Exploratory/Development Grant (PI: Michael I. Miga), 'Correcting for Soft Tissue Deformation in Image-Guided Liver Surgery', 10/1/2007-9/30/2011 (\$943,885).
- Vanderbilt University Discovery Grant (PI: Michael I. Miga), 'Quantifying Breast Cancer Architecture in Murine Systems Using Mechanical Testing, Cellular Assays, and Elastographic Imaging Methods', 8/1/2008-7/31/2010 (\$100,000).
- NSF: CPATH (PIs: Bobby Bodenheimer, Thomas J. Palmeri, David A. Weintraub, Michael I. Miga), 'Revitalizing Computing Education through Computational Science', 9/1/2009-8/31/2012, (\$300,000)
- NIH: R01 Investigator Initiated Award - Renewal (PI: Michael I. Miga), 'Multimodal Registration of the Brain's Cortical Surface', 1/1/2009-1/1/2013 (\$2,804,393).
- NIH: R01 Investigator Initiated Award (PI: Benoit M. Dawant), 'Computer-assisted functional surgery', 6/1/2010-5/31/2014, (\$1,700,000).
- NIH: R01 Investigator Initiated Award – Renewal (PI: Alan Bradshaw), 'Biomagnetic Characterization of Gastric Dysrhythmias', 09/30/2010-08/31/2014 (\$1,057,000)
- NIH: Academic Industrial Partnership - R01 (PD/PI: Michael I. Miga, co-PIs: William R. Jarnagin, James D. Stefansic), 'Clinical Translation of Deformation Compensation for Image-Guided Liver Surgery', 8/1/2011-6/30/2016, (\$3,152,939)
- ViSE: Pilot Grant (PIs: Ingrid M. Meszoely & Michael I. Miga), 'Towards Improving Surgical Resection for Breast Conserving Surgery', 7/1/2012-6/30/2013 (\$30,000).

- Equipment Contractual Agreement with BrainLAB (PI: Michael I. Miga), 'Realization of Brain Shift Compensation on BrainLAB's VectorLink Platform', 9/1/2012-2/1/2013 (\$549,966).
 - NIH: U01 Research Project Cooperative Agreement (PI: Tom E. Yankeelov, Vito Quaranta), 'Image Driven Multi-scale Modeling to Predict Treatment Response in Breast Cancer', 4/1/2013-3/31/2018 (\$3,370,000)
 - NIH: R21 Exploratory/Development Grant (PI: Tom E. Yankeelov), 'Integrating Quantitative Imaging and Biophysical Models to Predict Tumor Growth', 4/1/2013-3/31/2015 (\$428,328)
 - NIH: R01 Investigator Initiated Award - (PIs: Tom E. Yankeelov & Vito Quaranta), 'Quantitative Multiscale Imaging to Optimize Cancer Treatment Strategies', 4/1/2014-3/31/2019 (\$3,824,000).
 - NIH: R01 Investigator Initiated Award – 2nd Renewal (PI/PD: Michael I. Miga, co-PI: Reid C. Thompson, Alex J. Golby), 'Multimodal Registration of the Brain's Cortical Surface', 4/1/2014-3/31/2019 (\$3,910,781).
 - NIH: R21 Exploratory/Development Grant (PI: Robert J. Webster & Michael I. Miga), 'Debulking From Within: A Steerable Needle for Intracerebral Hemorrhage Aspiration', 4/1/2014-3/31/2016 (\$379,560).
 - NSF Graduate Student Fellowship (PI: Rebekah Conley, Primary Mentor: Michael I. Miga), 'Development of Image-guided Lumpectomy', 8/1/2013-7/31/2016 (\$90,000).
- **PENDING REVIEW:**
 - NIH: R21 Exploratory/Development Grant (PIs: Michael I. Miga & Ingrid M. Meszoely), 'A Novel Image Guided Platform Technology for Improving Breast Lumpectomy', 7/1/2015-6/30/2017 (\$400,970) – **pending**
 - NIH: T32 Training Grant (co-PI/PD: Michael I. Miga, co-PI: Robert Labadie), 'Training Program for Innovative Engineering Research in Surgery and Intervention', 5/25/2015, - **in prep.**

PUBLICATION SUMMARY:(citation report from *Web of Science & Google Scholar*)



Citation indices	All	Since 2010
Citations	4203	2068
h-index	31	26
i10-index	69	49

(a,b) The analysis currently supports an average of 25 citations per item and an h-index of 25 on *Web of Science*. (c) For additional referencing, the h-index on *Google Scholar* is listed as 31.

REFEREED JOURNAL PUBLICATIONS: (Graduate and medical student authors advised or under the supervision of Dr. Miga for the published work are underlined with post-doctoral research associates bolded, *** are peer review full length conference papers – 60% rejection rate)

1. D. W. Roberts, A. Hartov, F. E. Kennedy, **M. I. Miga**, K. D. Paulsen, ‘Intraoperative brain shift and deformation: a quantitative analysis of cortical displacement in 28 cases’, *Neurosurgery*, Vol. 32, No. 4, pp. 749-760, 1998.
2. **M. I. Miga**, K. D. Paulsen, F. E. Kennedy, ‘Von Neumann stability analysis of Biot’s general two-dimensional theory of consolidation’, *International Journal of Numerical Methods in Engineering*, Vol. 43, No. 5, pp. 955-974, 1998.
3. *****M. I. Miga**, K. D. Paulsen, F. E. Kennedy, P. J. Hoopes, A. Hartov, and D. W. Roberts, ‘Initial in-vivo analysis of 3D heterogeneous brain computations for model-updated image-guided neurosurgery’, *Lecture Notes in Computer Science: Medical Image Computing and Computer-Assisted Intervention – MICCAI 1998*, Springer Verlag, New York, Vol. 1496, pp. 743-752, 1998.
4. K. D. Paulsen, **M. I. Miga**, F. E. Kennedy, P. J. Hoopes, A. Hartov, and D. W. Roberts, ‘A computational model for tracking subsurface tissue deformation during stereotactic neurosurgery’, *IEEE Transactions on Biomedical Engineering*, Vol. 46, No. 2, pp. 213-225, 1999.

5. H. Pallatrone, A. Hartov, J. McInerney, L. A. Platenik, **M. I. Miga**, F. E. Kennedy, K. D. Paulsen, D. W. Roberts, 'Coregistered ultrasound as a neurosurgical guide', *Stereotactic and Functional Neurosurgery*, Vol. 73, No.1-4, pp. 143-147, 1999.
6. *****M. I. Miga**, K. D. Paulsen, F. E. Kennedy, A. Hartov, D. W. Roberts, 'Model-updated image-guided neurosurgery using the finite element method: Incorporation of the falx cerebri', *Lecture Notes in Computer Science: Medical Image Computing and Computer-Assisted Intervention – MICCAI 1999*, Springer Verlag, New York, Vol. 1679, pp. 900-909, 1999.
7. A. Hartov, S. D. Eisner, D. W. Roberts, K. D. Paulsen, L. A. Platenik, **M. I. Miga**, 'Error analysis for a freehand 3D ultrasound system for neuronavigation', *Neurosurgical Focus*, Vol. 6, No. 3, Article 5, 1999.
8. E. E. W. Van Houten, K. D. Paulsen, **M. I. Miga**, F. E. Kennedy, J. B. Weaver, 'An overlapping subzone technique for MR based elastic property reconstruction', *Magnetic Resonance in Medicine*, Vol. 46, No. 2, pp.213-225, 1999.
9. **M. I. Miga**, D. W. Roberts, A. Hartov, S. Eisner, J. M. Lemry, F. E. Kennedy, K. D. Paulsen, 'Updated neuroimaging using intraoperative brain modeling and sparse data', *Stereotactic and Functional Neurosurgery*, Vol. 72, pp. 103-106, 1999.
10. **M. I. Miga**, K. D. Paulsen, J. M. Lemry, F. E. Kennedy, S. D. Eisner, A. Hartov, D. W. Roberts, 'Model-updated image guidance: Initial clinical experience with gravity-induced brain deformation', *IEEE Transactions on Medical Imaging*, Vol. 18, No. 10, pp. 866-874, 1999.
11. D. W. Roberts, **M. I. Miga**, S. D. Eisner, A. Hartov, J. Lemry, F. E. Kennedy, K. D. Paulsen, 'Intraoperative updated neuroimaging using brain modeling and sparse data', *Neurosurgery*, Vol. 45, No. 5, pp. 1199-1207, 1999.
12. **M. I. Miga**, K. D. Paulsen, P. J. Hoopes, F. E. Kennedy, A. Hartov, D. W. Roberts, 'In vivo analysis and modeling of interstitial pressure in the brain under surgical loading', *ASME Journal of Biomechanical Engineering*, Vol. 122, No. 4, pp. 354-363, 2000.
13. E. E. W. Van Houten, J. B. Weaver, **M. I. Miga**, F. E. Kennedy, K. D. Paulsen, 'Elasticity reconstruction from experimental MR displacement data: Initial experience with an overlapping subzone finite element inversion process', *Medical Physics*, Vol. 27, No. 1, pp. 101-107, 2000.
14. *****M. I. Miga**, A. Staubert, K. D. Paulsen, F. E. Kennedy, V. M. Tronnier, D. W. Roberts, A. Hartov, L. A. Platenik, K. E. Lunn, 'Model-updated image-guided neurosurgery: Preliminary analysis using intraoperative MR', *Lecture Notes in Computer Science: Medical Image Computing and Computer-Assisted Intervention – MICCAI 2000*, Springer Verlag, New York, Vol. 1935, pp. 115-124, 2000.

15. **M. I. Miga**, K. D. Paulsen, P. J. Hoopes, F. E. Kennedy, A. Hartov, D. W. Roberts, 'In-vivo analysis of heterogeneous brain deformation computations for model-updated image guidance', *Computer Methods in Biomechanics and Biomedical Engineering*, Vol. 3, No. 2, pp. 129-146, 2000.
16. **M. I. Miga**, K. D. Paulsen, P. J. Hoopes, F. E. Kennedy, A. Hartov, D. W. Roberts, 'In vivo quantification of a homogeneous brain deformation model for updating preoperative images during surgery', *IEEE Transactions on Biomedical Engineering*, Vol. 47, No.2, pp. 266-273, 2000.
17. **M. I. Miga**, D. W. Roberts, F. E. Kennedy, L. A. Platenik, A. Hartov, K. E. Lunn, K. D. Paulsen, 'Computational Modeling of Retraction and Resection for Updating Images During Surgery', *Neurosurgery*, Vol. 49, No. 1, pp. 75-84, 2001.
18. P. M. Meaney, K. D. Paulsen, B. W. Pogue, **M. I. Miga**, 'Microwave image reconstruction utilizing log-magnitude and unwrapped phase to improve high-contrast object recovery', *IEEE Trans. on Medical Imaging*, Vol. 20, No. 2, pp. 104-116, 2001.
19. E. E. W. Van Houten, **M. I. Miga**, J. B. Weaver, F. E. Kennedy, K. D. Paulsen, 'Three-dimensional subzone-based reconstruction algorithm for MR elastography', *Magnetic Resonance in Medicine*, Vol. 45, No. 5, pp. 827-837, 2001
20. J. B. Weaver, E. E. W. Van Houten, **M. I. Miga**, F. E. Kennedy, K. D. Paulsen, 'Magnetic resonance elastography using 3D gradient echo measurements of steady-state motion', *Medical Physics*, vol. 28, no. 8, pp.1620-1628, 2001.
21. **M. I. Miga**, T. E. Kerner, T. M. Darcey, 'Source localization using finite elements and targeted simulated annealing', *IEEE Trans. on Biomedical Engineering*, vol. 49, no. 7, pp. 743-745, 2002.
22. L. A. Platenik, **M. I. Miga**, D. W. Roberts, K. E. Lunn, F. E. Kennedy, A. Hartov, K. D. Paulsen, 'In Vivo quantification of retraction deformation modeling for updated image-guidance during neurosurgery', *IEEE Trans. on Biomedical Engineering*, vol. 49, no. 8, pp. 823-835, 2002.
23. ***T. K. Sinha, D. M. Cash, R. J. Weil, R. L. Galloway, **M. I. Miga**, 'Cortical surface registration using texture mapped point clouds and mutual information', *Lecture Notes in Computer Science: Medical Image Computing and Computer-Assisted Intervention – MICCAI 2002*, Springer Verlag, New York, Vol. 2488, Part 2, pp. 533-540, 2002.
24. **M. I. Miga**, 'A new approach to elastography using mutual information and finite elements', *Physics in Medicine and Biology*, vol. 48, no. 4, pp. 467-480, 2003.
25. D. M. Cash, T. K. Sinha, W. C. Chapman, H. Terawaki, B. M. Dawant, R. L. Galloway, and **M. I. Miga**, 'Incorporation of a laser range scanner into image-guided liver surgery: surface acquisition, registration, and tracking', *Medical Physics*, vol. 30, no. 7, pp. 1671-1682, 2003.

26. **M. I. Miga**, T. K. Sinha, D. M. Cash, R. L. Galloway, and R. J. Weil, 'Cortical surface registration for image-guided neurosurgery using laser-range scanning', *IEEE Transactions on Medical Imaging*, vol. 22, no. 8, pp.973-985, 2003.
27. ***V. Duay, T. K. Sinha, P. D'Haese, **M. I. Miga**, B. M. Dawant, 'Non-rigid registration of serial intra-operative images for automatic brain-shift estimation', *Lecture Notes in Computer Science: Biomedical Image Registration*, Springer Verlag, New York, Vol. 2717, pp. 61-70, 2003.
28. ***T. K. Sinha, V. Duay, B. M. Dawant, **M. I. Miga**, 'Cortical shift tracking using a laser range scanner and deformable registration methods', *Lecture Notes in Computer Science: Medical Image Computing and Computer-Assisted Intervention – MICCAI 2003*, Vol. 2879, Part 2, pp. 166-174, 2003.
29. ***P. Dumpuri, R. C. Chen, and **M. I. Miga**, 'Model updated image guidance: A statistical approach', *Lecture Notes in Computer Science: Medical Image Computing and Computer-Assisted Intervention – MICCAI 2003*, Vol. 2878, Part 1, pp. 375-382, 2003.
30. C. W. Washington, and **M. I. Miga**, 'Modality Independent Elastography (MIE): A New Approach to Elasticity Imaging', *IEEE Transactions on Medical Imaging*, vol. 23, no. 9, pp. 1117-1128, 2004.
31. T. K. Sinha, B. M. Dawant, V. Duay, D. M. Cash, R. J. Weil, and **M. I. Miga**, 'A method to track cortical surface deformations using a laser range scanner', *IEEE Transactions on Medical Imaging*, vol. 24, no. 6, pp. 767-781, 2005.
32. D. M. Cash, **M. I. Miga**, T. K. Sinha, R. L. Galloway, and W. C. Chapman, 'Compensating for intra-operative soft tissue deformations using incomplete surface data and finite elements', *IEEE Transactions on Medical Imaging*, vol. 24, no. 11, pp. 1479-1491, 2005.
33. **M. I. Miga**, M. P. Rothney, J. Ou, 'Modality Independent Elastography (MIE): Potential applications in Dermoscopy', *Medical Physics*, vol. 32, no. 5, pp. 1308-1320, 2005.
34. T. K. Sinha, **M. I. Miga**, D. M. Cash, and R. J. Weil, 'Intraoperative Cortical Surface Characterization Using Laser Range Scanning: Preliminary Results', *Neurosurgery*, Vol. 59, No. 4, pp. 368-377, 2006.
35. P. Dumpuri, R. C. Thompson, B. M. Dawant, **A. Cao**, **M. I. Miga**, 'An atlas-based method to compensate for brain shift: Preliminary Results', *Medical Image Analysis*, Vol. 11, No. 2, pp. 128-145, 2007.
36. D. M. Cash, M. I. Miga, S. C. Glasgow, B. M. Dawant, L. W. Clements, Z. Cao, R. L. Galloway, and W. C. Chapman, 'Image-guided liver surgery: Concepts and initial clinical experiences', *Journal of Gastrointestinal Surgery*, DOI: 10.1007/s11605-007-0090-6, 2007.

37. A. Lyshchik, R. Moses, S. L. Barnes, T. Higashi, R. Asato, **M. I. Miga**, J. C. Gore, A. C. Fleischer. Quantitative analysis of tumor vascularity in benign and malignant solid thyroid nodules. *Journal of Ultrasound in Medicine*, Vol. 26, pp. 837-846, 2007.
38. A. Lyshchik, R. Moses, S. L. Barnes, T. Higashi, **M. I. Miga**, A. C. Fleischer 'Sonographic appearance of thyroid tumors with different aggressiveness and metastatic potential', *American Journal of Roentgenology*, Vol. 188, No. 5, Suppl S., 2007
39. C. C. R. Chen, **M. I. Miga**, and R. L. Galloway, 'Characterization of tracked radiofrequency ablation in phantom,' *Medical Physics*, vol. 34, pp. 4030-4040, 2007.
40. S. L. Barnes, A. Lyshchik, M. K. Washington, J. C. Gore, and **M. I. Miga**, 'Development of a mechanical testing assay for fibrotic murine liver,' *Medical Physics*, vol. 34, pp. 4439-4450, 2007.
41. F. Granero-Molto, J. A. Weis, L. D. O'Rear, **M. I. Miga**, and A. Spagnoli, 'IGF-I engineered bone marrow mesenchymal stem cells improve the fracture healing process,' *Journal of Bone and Mineral Research*, vol. 22, pp. S105-S105, 2007.
42. J. A. Weis, F. Granero-Molto, L. D. O'Rear, **M. I. Miga**, and A. Spagnoli, 'Development of a high-resolution 3D Micro-CT based model to predict fracture callus histological architecture,' *Journal of Bone and Mineral Research*, vol. 22, pp. S482-S483, 2007.
43. A. Cao, R. C. Thompson, P. Dumpuri, B. M. Dawant, R. L. Galloway, S. Ding, and **M. I. Miga**, 'Laser range scanning for image-guided neurosurgery: Investigation of image-to-physical space registrations,' *Medical Physics*, vol. 35, pp. 1593-1605, 2008.
44. L. W. Clements, W. C. Chapman, B. M. Dawant, R. L. Galloway, and **M. I. Miga**, 'Robust surface registration using salient anatomical features for image-guided liver surgery: Algorithm and validation,' *Medical Physics*, vol. 35, pp. 2528-2540, 2008.
45. F. Granero-Molto, J. A. Weis, B. Landis, L. Longobardi, **M. I. Miga**, and A. Spagnoli, 'Mesenchymal Stem Cells Enhance Fracture Healing: Essential Role for Cytokines in Homing and Anti-Inflammatory Response,' *Journal of Bone and Mineral Research*, vol. 23, pp. S166-S167, 2008.
46. J. J. Ou, R. E. Ong, T. E. Yankeelov, and **M. I. Miga**, 'Evaluation of 3D modality-independent elastography for breast imaging: a simulation study,' *Physics in Medicine and Biology*, vol. 53, pp. 147-163, 2008.
47. R. C. Chen, **M. I. Miga**, R. L. Galloway, 'Optimizing Needle Placement Using Finite Element Models in Radiofrequency Ablation Planning', *IEEE Transactions on Biomedical Engineering*, vol. 56, no. 2, pp. 237-245, 2009.

48. S. L. Barnes, P. P. Young, **M. I. Miga**, 'A novel model-gel-tissue assay analysis for comparing tumor elastic properties to collagen content', *Biomechanics and Modeling in Mechanobiology*, Vol. 8, No. 4, pp. 337-34, 2009.
49. S. Ding, **M. I. Miga**, J. H. Noble, A. Cao, P. Dumpuri, R. C. Thompson, and B. M. Dawant, 'Semi-automatic registration of pre- and postbrain tumor resection laser range data: Method and validation', *IEEE Transactions on Biomedical Engineering*, Vol. 56, No. 3, pp.770-780, 2009.
50. F. Granero-Molto, J. A. Weis, **M. I. Miga**, B. Landis, T. J. Meyers, L. O'Rear, L. Longobardi, D. E. Jansen, D. P. Mortlock, A. Spagnoli, 'Regenerative effects of transplanted mesenchymal stem cells in fracture healing', *Stem Cells*, Vol. 27, No. 8., pp.1887-1898, 2009.
51. D. M. Kwartowitz, **M. I. Miga**, S. D. Herrell, R. L. Galloway, 'Towards image guided robotic surgery: multi-arm tracking through hybrid localization', *Int. J. Computer Assisted Radiology and Surgery*, Vol. 4, No. 3, pp. 281-286, 2009.
52. *****M. I. Miga**, J. A. Weis, F. Granero-Molto, A. Spagnoli, 'Quantifying mechanical properties in a murine fracture healing system using an inverse geometric nonlinear elasticity modeling framework', *Lecture Notes in Computer Science: Biomedical Simulation*, vol. 5958, F. Bello, and S. Cotin, Eds. Berlin: Springer-Verlag Berlin, pp. 29-37, 2010.
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57. A. L. Simpson, B. Ma, R. E. Ellis, A. J. Stewart, and **M. I. Miga**, 'Uncertainty propagation and analysis of image-guided surgery', *SPIE 2011 Medical Imaging: Visualization, Image-Guided Procedures, and Modeling Conference*, Vol. 7964, 2011.

58. T. S. Pheiffer, B. Lennon, A. L. Simpson, and **M. I. Miga**, 'Development of a novel laser range scanner', *SPIE 2011 Medical Imaging: Visualization, Image-Guided Procedures, and Modeling Conference*, Vol. 7964, 2011.

59. M. J. Shannon, I. M. Meszoely, T. S. Pheiffer, A. L. Simpson, K. Sun, J. E. Ondrake, and **M. I. Miga**, 'Initial study of breast tissue reiteration toward image-guided breast surgery', *SPIE 2012 Medical Imaging: Image-Guided Procedures, Robotic Interventions, and Modeling Conference*, Vol. 8316, 2012.

60. K. Sun, W. J. Rodriguez, S. Pallavaram, B. M. Dawant, and **M. I. Miga**, 'Optimizing the delivery of deep brain stimulation using electrophysiological atlases and an inverse modeling approach', *SPIE 2012 Medical Imaging: Image-Guided Procedures, Robotic Interventions, and Modeling Conference*, Vol. 8316, 2012.

61. A. L. Simpson, J. Burgner, I. Chen, T. S. Pheiffer, K. Sun, R. C. Thompson, R. J. Webster, and **M. I. Miga**, 'Intraoperative brain resection cavity characterization with conoscopic holography', *SPIE 2012 Medical Imaging: Image-Guided Procedures, Robotic Interventions, and Modeling Conference*, Vol. 8316, 2012.

62. K. E. Miller, J. E. Ondrake, T. S. Pheiffer, A. L. Simpson, and **M. I. Miga**, 'Utilizing ultrasound as a surface digitization tool in image guided liver surgery', *SPIE 2012 Medical Imaging: Image-Guided Procedures, Robotic Interventions*, Vol. 8316, 2012.

63. P. J. Swaney, J. Burgner, T. S. Pheiffer, D. C. Rucker, H. B. Gilbert, J. E. Ondrake, A. L. Simpson, E. C. Burdette, **M. I. Miga**, and R. J. Webster, 'Tracked 3D ultrasound targeting with an active cannula', *SPIE 2012 Medical Imaging: Image-Guided Procedures, Robotic Interventions*, Vol. 8316, 2012.

64. J. A. Weis, S. L. Barnes, T. E. Yankeelov, and **M. I. Miga**, 'Material property assessment of a murine model of triple negative breast cancer using modality independent elastography: Preliminary results', *Proceedings BMES 2012 Annual Meeting*, Atlanta, GA, 2012.

65. T. S. Pheiffer, B. C. Byram, and **M. I. Miga**, 'Monitoring surgical resection of tumors with ultrasound strain imaging', *Proc. Of the 11th International Tissue Elasticity Conference*, Deauville, France, 2012.

66. **M. I. Miga**, 'Deformation compensation strategies for image-guided surgery using sparse data', *5th National Center for Image-guided Therapy NIH Image Guided Therapy Workshop*, 9/21/2012, Boston, MA.

67. D. C. Rucker, Y. Wu, T. S. Pheiffer, A. L. Simpson, and **M. I. Miga**, 'A novel iterative approach for accounting for non-rigid deformations in image guided liver surgery using sparse surface data', *5th National Center for Image-guided Therapy NIH Image Guided Therapy Workshop*, 9/21/2012, Boston, MA.
68. T. S. Pheiffer, A. L. Simpson, J. E. Ondrake, and **M. I. Miga**, 'Geometric reconstruction using tracked ultrasound strain imaging', *SPIE 2013 Medical Imaging: Image-Guided Procedures, Robotic Interventions*, Vol. 8671, 2013.
69. J. A. Weis, T. E. Yankeelov, S. A. Munoz, R. A. Sastry, S. L. Barnes, L. R. Arlinghaus, X. Li, and **M. I. Miga**, 'A consistent pre-clinical/clinical elastography approach for assessing tumor mechanical properties in therapeutic systems', *SPIE 2013 Medical Imaging: Biomedical Applications in Molecular, Structural, and Functional Imaging*, Vol. 8672, 2013.
70. J. A. Weis, **M. I. Miga**, X. Li, L. R. Arlinghaus, A. B. Chakavarthy, V. Abramson, R. G. Abramson, J. Farley, and T. E. Yankeelov, 'A mechanically coupled reaction diffusion model of breast tumor response during neoadjuvant chemotherapy', *SPIE 2013 Medical Imaging: Biomedical Applications in Molecular, Structural, and Functional Imaging*, Vol. 8672, 2013.
71. I. Chen, A. L. Simpson, K. Sun, R. C. Thompson, and **M. I. Miga**, 'Sensitivity analysis and automation for intraoperative implementation of the atlas-based method for brain shift correction', *SPIE 2013 Medical Imaging: Image-Guided Procedures, Robotic Interventions*, Vol. 8671, 2013.
72. D. C. Rucker, Y. Wu, J. E. Ondrake, T. S. Pheiffer, A. L. Simpson, and **M. I. Miga**, 'Nonrigid liver registration for image-guided surgery using partial surface data: A novel iterative approach', *SPIE 2013 Medical Imaging: Image-Guided Procedures, Robotic Interventions*, Vol. 8671, 2013.
73. A. N. Kumar, T. S. Pheiffer, A. L. Simpson, R. C. Thompson, **M. I. Miga**, and B. M. Dawant, 'Phantom-based comparison of the accuracy of point clouds extracted from stereo cameras and laser range scanner', *SPIE 2013 Medical Imaging: Image-Guided Procedures, Robotic Interventions*, Vol. 8671, 2013.
74. Y. Wu, D. C. Rucker, R. H. Conley, T. S. Pheiffer, A. L. Simpson, S. K. Geevarghese, and **M. I. Miga**, 'Registration of liver images to minimally invasive intraoperative surface and subsurface data', *SPIE 2014 Medical Imaging: Image-Guided Procedures, Robotic Interventions*, Vol. 9036, 2014.
75. R. H. Conley, I. M. Meszoely, T. S. Pheiffer, L. W. Clements, J. A. Weis, T. E. Yankeelov, and **M. I. Miga**, 'Image to physical space registration of supine breast MRI for image guided breast surgery', *SPIE 2014 Medical Imaging: Image-Guided Procedures, Robotic Interventions*, Vol. 9036, 2014.
76. D. K. Kim, J. A. Weis, T. E. Yankeelov, and **M. I. Miga**, 'Utilizing a reference material for assessing absolute tumor mechanical properties in modality independent

elastography', *SPIE 2014 Medical Imaging: Biomedical Applications in Molecular, Structural, and Functional Imaging*, Vol. 9038, 2014.

77. J. A. Weis, D. K. Kim, T. E. Yankeelov, and **M. I. Miga**, 'Validation and reproducibility assessment of modality independent elastography in a pre-clinical model of breast cancer', *SPIE 2014 Medical Imaging: Biomedical Applications in Molecular, Structural, and Functional Imaging*, Vol. 9038, 2014.

78. A. J. Simpson, R. K. Do, E. P. Parada, **M. I. Miga**, and W. R. Jarnagin, 'Texture feature analysis for prediction of postoperative liver failure prior to surgery', *SPIE 2014 Medical Imaging: Image Processing*, Vol. 9034, 2014.

79. J. A. Weis, R. H. Conley, K. M. Flint, A. M. Searfoss, A. M. Johnsen, R. G. Abramson, and T. E. Yankeelov, and **M. I. Miga**, 'Applications in modality independent elastography (MIE)', *Frontiers in Elastography*, 2014.

80. J. A. Weis, X. Li, L. Arlinghaus, A. B. Chakravarthy, V. Abramson, J. Farley, T. E. Yankeelov, and **M. I. Miga**, 'Using elastographic data and modeling to predict the response of breast cancer to neoadjuvant chemotherapy', *Frontiers in Elastography*, 2014.

81. J. A. Weis, **M. I. Miga**, X. Li, L. Arlinghaus, A. B. Chakravarthy, V. Abramson, J. Farley, T. E. Yankeelov, 'Prediction of response to neoadjuvant chemotherapy using a mechanically coupled reaction-diffusion model', 56th Annual AAPM Meeting, Austin, TX, July 2014.*** Selected for Science Council Session.

82. L. W. Clements, I. Norton, A. J. Golby, R. C. Thompson, W. E. Wells and **M. I. Miga**, 'Towards validation of a model-based deformation correction approach in image-guided neurosurgery via intraoperative magnetic resonance imaging', *Proceedings of 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Chicago, IL, 2014.

83. A. N. Kumar, **M. I. Miga**, T. S. Pheiffer, L. B. Chambless, R. C. Thompson, and B. M. Dawant, 'Automatic tracking of intraoperative brain surface displacements in brain tumor surgery', *Proceedings of 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Chicago, IL, 2014.

84. **M. I. Miga**, 'Surgery & engineering: Computational modeling enabling therapy', *Proceedings of 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Chicago, IL, 2014.

85. **M. I. Miga**, 'Mini-symposia: Novel technology platforms for improved surgical intervention & guidance', *Proceedings of 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Chicago, IL, 2014.

86. J. A. Collins, D. B. Brown, T. P. Kingham, W. R. Jarnagin, **M. I. Miga**, and L. W. Clements, 'Method for evaluation of predictive models of microwave ablation via post-

procedural clinical imaging', *SPIE 2015 Medical Imaging: Image-Guided Procedures, Robotic Interventions*, (in press), Orlando, FL, 2015.

87. L. W. Clements, J. A. Collins, A. L. Simpson, Y. Wu, W. R. Jarnagin, and **M. I. Miga**, 'Validation of model-based deformation correction in image-guided liver surgery via tracked intraoperative ultrasound: preliminary method and results', *SPIE 2015 Medical Imaging: Image-Guided Procedures, Robotic Interventions*, (in press), Orlando, FL, 2015.

88. J. A. Weis, A. M. Johnsen, G. E. Wile, T. E. Yankeelov, R. G. Abramson, and **M. I. Miga**, 'Development of a diaphragmatic motion-based elastography framework for assessment of liver stiffness', *SPIE 2015 Medical Imaging: Biomedical Applications in Molecular, Structural, and Functional Imaging*, (in press), Orlando, FL, 2015.

89. K. M. Flint, J. A. Weis, T. E. Yankeelov, and **M. I. Miga**, 'Repeatability assessment of modality independent elastography in a pre-clinical murine model', *SPIE 2015 Medical Imaging: Biomedical Applications in Molecular, Structural, and Functional Imaging*, (in press), Orlando, FL, 2015.

90. U. Leung, A. L. Simpson, L. B. Adams, W. R. Jarnagin, **M. I. Miga**, and T. P. Kingham, 'Image guidance improves localization of sonographically occult colorectal liver metastases', *SPIE 2015 Medical Imaging: Image-Guided Procedures, Robotic Interventions*, (in press), Orlando, FL, 2015.

91. **M. I. Miga**, 'Model-assisted image guided approach for tumor resection in neurosurgery', *5th Annual International Conference in Computational Surgery*, National Institutes of Health, Washington, DC, 1/20/2015.

OTHER PUBLICATIONS:

1. M. Scherer, C. Zhang, and **M. I. Miga**, *BMEPulse*, Vol. 1, No. 1, Fall 2008.
2. C. Zhang, and **M. I. Miga**, *BMEPulse*, Vol. 1, No. 2, Spring 2009.
3. C. Zhang, and **M. I. Miga**, *BMEPulse*, Vol. 2, No. 1, Fall 2009.
4. C. Zhang, and **M. I. Miga**, *BMEPulse*, Vol. 2, No. 2, Spring 2010.
5. C. Ruelens, E. Von Stein and **M. I. Miga**, *BMEPulse*, Vol. 3, No. 1, Fall 2010.
6. C. Ruelens, E. Von Stein and **M. I. Miga**, *BMEPulse*, Vol. 3, No. 2, Spring 2011.
7. E. Von Stein and **M. I. Miga**, *BMEPulse*, Vol. 4, No. 1, Fall 2011.
8. E. Von Stein and **M. I. Miga**, *BMEPulse*, Vol. 4, No. 2, Spring 2012.
9. E. Von Stein and **M. I. Miga**, *BMEPulse*, Vol. 5, No. 1, Fall 2012.

10. E. Von Stein and **M. I. Miga**, *BMEPulse*, Vol. 5, No. 2, Spring 2013
11. J. Duan and **M. I. Miga**, *BMEPulse*, Vol. 6, No. 1, Fall 2013
12. J. Duan and **M. I. Miga**, *BMEPulse*, Vol. 6, No. 2, Spring 2014
13. J. Duan, D. Black, and **M. I. Miga**, *BMEPulse*, Vol. 7, No. 1, Fall 2014

PATENT/TECHNOLOGY TRANSFER SUBMISSIONS:

1. **M. I. Miga**, Patent Application: "Elastography Imaging Modalities for Characterizing Properties of Tissue," U.S. Patent Application No. 10/787,056.
2. **M. I. Miga**, B. M. Dawant, T. K. Sinha, VU03106, Technology Transfer Application: Cortical Surface Registration and Deformation Tracking Using laser Range Scanning and Textured Point Clouds for Patient-Alignment, 6/16/2003.
3. **M. I. Miga**, P. Dumpuri, C. R. Chen VU0506, Technology Transfer Application: Brain Shift Compensation Using Computer Models, 7/22/2004.
4. **M. I. Miga**, D. M. Cash VU105 (CIP): "Method and Apparatus for Collecting and Processing Physical Space Data for Use While Performing Image Guided Surgery", 6/27/2001.
5. **M. I. Miga**, R. L. Galloway, L. W. Clements VU 0734, VU0735 – 'Apparatus and Methods for Compensating for Organ Deformation, Apparatus and Methods for Registration of Internal Structures to Images, and Applications of Same', 1/2008.
6. **M. I. Miga**, P. Dumpuri VU1040 - 'A Local Stylus and/or Image Transformation Device to Correct Data for Deformations in Image-Guided Procedures', 1/2011.
7. D. C. Rucker, and **M. I. Miga** Continuation in Part to VU1040 – 'Enhanced Method for Correcting Data for Deformations During Image-Guided Procedures', 12/2012.

PRESENTATIONS:

1. Invited Seminar: **M. I. Miga**, 'Modeling surgical loads to account for subsurface tissue deformation', Radiobiology and Bioengineering Research Program, Dartmouth Hitchcock Medical Center, Lebanon, NH, 10/22/97.
2. Poster Presentation: **M. I. Miga**, 'A 3D brain deformation model experiencing comparable surgical loads', 19th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Chicago, IL, 10/30/97.
3. Invited Seminar: **M. I. Miga**, 'Engineering science at Dartmouth in the "Decade of the Brain"', Thayer School Distinguished Fellow Seminar, Dartmouth College, Thayer School of Engineering, Hanover, NH, 5/98.

4. Conference Poster: **M. I. Miga**, 'A 3D brain deformation model experiencing surgical loads', 12th Annual Neuroscience Day at Dartmouth College, Dartmouth College, Hanover, NH, 1/30/98.
5. Platform Presentation: **M. I. Miga**, 'In vivo analysis of 3D brain computations for model-updated image-guided stereotactic neurosurgery', IEEE 24th Annual Northeast Bioengineering Conference, Hershey Medical Center, Hershey, PA, 4/9-10/1998.
6. Conference Poster: **M. I. Miga**, 'Initial in-vivo analysis of 3D heterogeneous brain computations for model-updated image-guided neurosurgery', First International Conference on Medical Image Computing and Computer-Assisted Intervention, Massachusetts Institute of Technology, Boston, MA, 10/11/98.
7. Invited Seminar: **M. I. Miga**, 'Brain modeling for model-updated image-guided neurosurgery', ENGS5 – Healthcare and Technology in the 21st Century, Dartmouth College, Thayer School of Engineering, Hanover, NH 4/29/98.
8. Invited Seminar: **M. I. Miga**, 'How can computational modeling improve tumor resection during neurosurgery?', Department of Diagnostic Radiology, Yale University, New Haven, CT, 7/99.
9. Conference Poster: **M. I. Miga**, 'Model-updated image-guided neurosurgery: Incorporation of the falx cerebri', 2nd International Conference on Medical Image Computing and Computer-Assisted Intervention, Cambridge University, Cambridge, England, 9/22/99.
10. Conference Poster: **M. I. Miga**, 'Model-updated image-guided neurosurgery: Preliminary analysis using intraoperative MR', 3rd International Conference on Medical Image Computing and Computer-Assisted Intervention, Pittsburgh, Pennsylvania, USA, 10/12/2000.
11. Invited Seminar: **M. I. Miga**, 'Computational modeling for image-guided therapy', Vanderbilt University, Department of Biomedical Engineering, Nashville, TN, 2/2000.
12. Platform Presentation: **M. I. Miga**, 'Incorporation of surface-based deformations for updating images intraoperatively', Medical Imaging 2001 Conference: Visualization, Display, and Image-guided Procedures: Proc. of the SPIE, 2/18/2001.
13. Journal Club Seminar, **M. I. Miga**, 'Analysis and Advances in Biomedical Modeling', Vanderbilt University, Department of Physics, Research Group of John Wikswo, 3/2001.
14. Platform Presentation: **M. I. Miga**, 'Modality independent elastography', M. I. Miga, 5th Tennessee Conference on Biomedical Engineering, 4/2002.
15. Platform Presentation: **M. I. Miga**, 'A new approach to elastographic imaging: Modality independent elastography', Medical Imaging 2002 Conference: Image Processing: Proc. of the SPIE, 2/24/2002.

16. Invited Seminar: **M. I. Miga**, 'Advances in Image-Guided Therapy', Guest lecture in *BME 318: Principles and Applications in Magnetic Resonance Imaging* (taught by Dr. Cynthia Paschal), Vanderbilt University, Department of Biomedical Engineering, 4/2002.
17. Platform Presentation: **M. I. Miga**, 'Textured laser range scanning and registration of the cortical surface', 24th Annual International Joint Conference of EMBS and BMES, 10/26/2002.
18. Invited Seminar: **M. I. Miga**, 'New Roles for Computational Modeling in Biomedicine', Vanderbilt University, Department of Psychology, 1/23/2003.
19. Platform Presentation: **M. I. Miga**, 'Intraoperative registration of the liver for image-guided surgery using laser range scanning and deformable models', Medical Imaging 2003: Visualization, Display, and Image-guided Procedures: Proc. of the SPIE, 2/18/2003.
20. Poster Presentation: **M. I. Miga**, 'Analysis of model-updated MR images to correct for brain deformation due to tissue retraction', Medical Imaging 2003: Visualization, Display, and Image-guided Procedures: Proc. of the SPIE, 2/18/2003 (1st place Cum Laude Award).
21. Invited Seminar: **M. I. Miga**, 'Model-based Imaging Methods', Guest lecture for Vanderbilt University Institute of Imaging Science Seminar, 9/26/2003.
22. Invited Seminar Series: **M. I. Miga**, 'Biomechanical Modeling for Image Registration: Applications in Image-Guided Neurosurgery: Part I', and, 'Biomechanical Modeling for Image Registration: Applications in Image-Guided Neurosurgery: Part II', Guest lecturer for *CS 395: Medical Image Registration* (taught by Dr. J. Michael Fitzpatrick), Vanderbilt University, Department of Electrical Engineering, 12/9/2003, and 12/11/2003.
23. Poster Presentation: **M. I. Miga**, 'Modality Independent Elastography: Preliminary Results', Medical Imaging 2003: Image Processing: Proc. of the SPIE, 2/18/2004.
24. Invited Seminar: **M. I. Miga**, 'New Roles for Computational Modeling in Biomedicine', Guest lecture for University of Alabama, Department of Chemical and Bioengineering, Tuscaloosa, AL, 3/11/2004.
25. Poster Presentation: Megan P. Rothney, and **M. I. Miga**, 'Evaluation of a Similarity-Based Elastography Technique using Four Similarity Metrics', 2004 IEEE International Symposium on Biomedical Imaging: From Nano to Macro, 4/16/2004.
26. SPIE Medical Imaging 2006: Short Course on Image-Guided Procedures and Computer Aided Surgery: R. L. Galloway, K. Cleary, K. Wong, F. Banovac, **M. I. Miga**
27. Poster Presentation: C. R. Chen, **M. I. Miga**, and R. L. Galloway, 'Optimizing needle placement in radiofrequency ablation treatment planning', Medical Imaging

2006: Visualization, Image-guided Procedures, and Display: Proc. of the SPIE, 2/11-16/2006.

28. Poster Presentation: D. R. Schuler III, J. J. Ou, and **M. I. Miga**, 'Automatic surface correspondence methods for a deformed breast', Medical Imaging 2006: Visualization, Image-guided Procedures, and Display: Proc. of the SPIE, 2/11-16/2006.

29. Poster Presentation: T. K. Sinha, and **M. I. Miga**, 'Investigation of a block matching algorithm for determining spatial constraints in morphometric analysis', Medical Imaging 2006: Physiology, Function and Structure from Medical Images: Proc. of the SPIE, 2/11-16/2006.

30. Poster Presentation: J. J. Ou, S. L. Barnes, and **M. I. Miga**, 'Preliminary testing of sensitivity to input data quality in an elastographic reconstruction method', International Symposium on Biomedical Imaging 2006, Washington, D.C., 4/6/2006.

31. Poster Presentation: A. Cao, and **M. I. Miga**, 'Tracking cortical surface deformations based on vessel structure using a laser range scanner', International Symposium on Biomedical Imaging 2006, Washington, D.C., 4/6/2006.

32. Poster Presentation: D. Knaus, **M. I. Miga**, 'Tracking cortical surface deformations based on vessel structure using a laser range scanner', International Symposium on Biomedical Imaging 2006, Washington, D.C., 4/6/2006.

33. Invited Seminar: **M. I. Miga**, 'Augmenting dermoscopy with elastography: Preliminary work', Melanoma Seminar Series, Vanderbilt University, 2006.

34. Short Course: **M. I. Miga**, 'An introduction to finite elements for medical imaging', Medical Imaging 2007: Visualization, Image-guided Procedures, and Display.

35. Platform Presentation: **M. I. Miga**, 'An elastography framework for use in dermoscopy', Medical Imaging 2007: Physiology, Function and Structure from Medical Images, 2007.

36. Poster Presentation: R. E. Ong, **M. I. Miga**, 'Using laplace's equation for nonrigid registration of breast surfaces', Medical Imaging 2007: Visualization, Image-guided Procedures, and Display: Proc. of the SPIE, 2007.

37. Poster Presentation: K. H. Ha, **M. I. Miga**, 'Modeling surgical procedures to assist in understanding surgical approach', Medical Imaging 2007: Visualization, Image-guided Procedures, and Display: Proc. of the SPIE, 2007.

38. Poster Presentation: **M. I. Miga**, 'An evaluation of 3D modality independent elastography robustness to boundary condition noise', Medical Imaging 2007: Physiology, Function and Structure from Medical Images: Proc. of the SPIE, 2007.

39. Poster Presentation: I. Garg, and **M. I. Miga**, 'Preliminary investigation of the inhibitory effects of mechanical stress in tumor growth', SPIE Medical Imaging 2008: Visualization, Image-Guided Procedures, and Modeling Conference, Vol. 6918, 2008.
40. Workshop Presentation: **M. I. Miga**, 'The changing roles for soft-tissue modeling: Therapy guidance, imaging, and characterization', Medical Imaging 2008: Visualization, Image-guided Procedures, and Display.
41. Short Course: **M. I. Miga**, 'An introduction to finite elements for medical imaging', Medical Imaging 2008: Visualization, Image-guided Procedures, and Display.
42. Short Course: **M. I. Miga**, 'An introduction to finite elements for medical imaging', Medical Imaging 2009: Visualization, Image-guided Procedures, and Display.
43. Workshop Platform Presentation: J. B. Weaver, M. M. Doyley, M. F. Insana, A. Manduca, **M. I. Miga**, K. J. Parker, and K. D. Paulsen, 'Elastography Directions and Applications for Ultrasound and MR Palpation Workshop', SPIE 2009 Workshop for Biomedical Applications in Molecular, Structural, and Functional Imaging Conference.
44. Poster Presentation: P. Dumpuri, L. W. Clements, R. Li, J. M. Waite, J. D. Stefansic, D. A. Geller, **M. I. Miga**, B. M. Dawant, 'Comparison of pre/post-operative CT image volumes to preoperative digitization of partial hepatectomies: A feasibility study in surgical validation', SPIE Medical Imaging 2009: Visualization, Image-Guided Procedures, and Modeling Conference, 2009.
45. Poster Presentatin: D. Hackworth, P. Dumpuri, and **M. I. Miga**, 'A dual compute resource strategy for computational model-assisted therapeutic interventions', SPIE Medical Imaging 2009: Visualization, Image-Guided Procedures, and Modeling Conference, 2009.
46. Short Course: **M. I. Miga**, 'An introduction to finite elements for medical imaging', Medical Imaging 2010: Visualization, Image-guided Procedures, and Display.
47. Platform Presentation: **M. I. Miga**, 'Quantifying mechanical properties in a murine fracture healing system using an inverse geometric nonlinear elasticity modeling framework', 5th International Symposium on Biomedical Simulation, 2/ 2010
48. Platform Presentation: **M. I. Miga**, 'Quantifying mechanical properties in a murine fracture healing system using an inverse geometric nonlinear elasticity modeling framework', 5th International Symposium on Biomedical Simulation, Phoenix, AZ 2/ 2010 .
50. Platform Presentation: **M. I. Miga**, 'Quantifying mechanical properties in a murine fracture healing system using inverse modeling: preliminary work', SPIE Medical Imaging 2010: Biomedical Applications in Molecular, Structural, and Functional Imaging, San Diego, CA 3/2010.

51. Platform Presentation: **M. I. Miga**, 'The sparse data extrapolation problem: Strategies for soft-tissue correction for image-guided liver surgery', SPIE 2011 Medical Imaging: Visualization, Image-Guided Procedures, and Modeling Conference, Orlando, FL 3/2011.
52. Invited Seminar: **M. I. Miga**, 'Surgery and engineering: Computation enabling therapy', University of Pennsylvania, Department of Radiology, 6/2011.
53. Invited Seminar: **M. I. Miga**, 'Surgery and engineering: Computation enabling therapy', University of Notre Dame, Department of Mechanical Engineering, 10/2011.
54. Poster Presentation: M. J. Shannon, and **M. I. Miga**, 'Initial study of breast tissue reiteration toward image-guided breast surgery', SPIE 2012 Medical Imaging: Image-Guided Procedures, Robotic Interventions, and Modeling Conference, San Diego, CA, 2/2012.
55. Poster Presentation: K. Sun, and **M. I. Miga**, 'Optimizing the delivery of deep brain stimulation using electrophysiological atlases and an inverse modeling approach', SPIE 2012 Medical Imaging: Image-Guided Procedures, Robotic Interventions, and Modeling Conference, San Diego, CA, 2/2012.
56. Poster Presentation: A. L. Simpson, and **M. I. Miga**, 'Intraoperative brain resection cavity characterization with conoscopic holography', SPIE 2012 Medical Imaging: Image-Guided Procedures, Robotic Interventions, and Modeling Conference, San Diego, CA, 2/2012.
57. Poster Presentation: K. E. Miller, and **M. I. Miga**, 'Utilizing ultrasound as a surface digitization tool in image guided liver surgery', SPIE 2012 Medical Imaging: Image-Guided Procedures, Robotic Interventions, San Diego, CA, 2/2012.
58. Poster Presentation: **M. I. Miga**, 'Material property assessment of a murine model of triple negative breast cancer using modality independent elastography: Preliminary results', BMES 2012, Atlanta, GA, 2012.
59. Platform Presentation: **M. I. Miga**, 'Deformation compensation strategies for image-guided surgery using sparse data', 5th National Center for Image-guided Therapy NIH Image Guided Therapy Workshop, 9/21/2012, Boston, MA.
60. Poster Presentation: **M. I. Miga**, 'A novel iterative approach for accounting for non-rigid deformations in image guided liver surgery using sparse surface data', 5th National Center for Image-guided Therapy NIH Image Guided Therapy Workshop, 9/21/2012, Boston, MA.
61. Workshop Presentation: M. S. Skala, R. J. Webster, and **M. I. Miga**, 'In Our Humble Opinions (IOHO): NIH Grant Tips, Experiences, & Review', ViSE Seminar Series, 6/2013.

62. Workshop Presentation: Mock Study Section, NIH Study Section: Understanding the NIH Peer Review System Relative When Competing for Grant Awards (Rosen, Gill), **Chair: M. I. Miga**, 2014.

63. Invited Seminar: **M. I. Miga**, 'Soft Tissue Image-Guided Surgery: Computational Modeling Enabling Therapy', Brigham and Women's Hospital, National Center for Image-Guided Therapy, Boston, MA, August 2014.

64. Invited Seminar: **M. I. Miga**, 'Soft Tissue Image-Guided Surgery: Computational Modeling Enabling Therapy', Analogic Inc., Peabody, MA, August 2014.

65. Invited Seminar: **M. I. Miga**, 'Biophysical Model-Embedded Systems for Therapeutic and Imaging Applications', Vanderbilt University Institute for Imaging Science, Nashville, TN, October 2014.

66. Platform Seminar: **M. I. Miga**, 'Model-assisted image guided approach for tumor resection in neurosurgery', *5th Annual International Conference in Computational Surgery*, National Institutes of Health, Washington, DC, 1/20/2015.

GENERAL PUBLIC PRESENTATIONS:

1. Special Feature Article: Stuart M. Hutson, 'Laser range scanner helps surgeons navigate: Imaging technique moves from guiding neurosurgery to the liver', *Biophotonics International*, pp. 52-53, June 2002.

2. Special Feature News Story: Amy Marsalis, 'Laser-guided brain surgery', Medical Breakthroughs with Amy Marsalis: News Channel 5, 7/11/2002.

3. B. Snyder, 'Piercing the body with precision: Guiding the Scalpel', *Lens Magazine*, pp.5-7, 2006.

4. J. Johnston, 'Strategic strengths', *Vanderbilt Engineering Magazine* (cover page), Fall 2009.

5. B. Synder, 'Grant bolsters liver tumor surgery techniques', *Vanderbilt Reporter*, 8/25/2011.

6. Fernanda Barros, 'Interview on Model-Updated Image-Guided Liver Surgery', Ivanhoe Broadcast News, Fall 2011.