

**Harvard Medical School/Harvard School of Dental Medicine
Format for the Curriculum Vitae**

Date Prepared: November 17, 2011
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Place of Birth: Anyang, Henan, China

Education

1999	B.Eng.	Electrical Engineering	University of Electronic Science and Technology of China (Chengdu, Sichuan, China)
2005	Ph.D.	Biomedical Engineering	Thayer School of Engineering, Dartmouth College (Hanover, NH, USA)

Postdoctoral Training

2005-2009	Research Fellow in Radiology	Optics Division (Lab Supervisor: David Boas)	Martinos Center for Biomedical Imaging, Massachusetts General Hospital
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Faculty Academic Appointments

2009-present	Instructor in Radiology	Department of Radiology	Harvard Medical School
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Appointments at Hospitals/Affiliated Institutions

2005-2009	Research Fellow	Department of Radiology	Massachusetts General Hospital
2009-present	Assistant in Biomedical Engineering	Department of Radiology	Massachusetts General Hospital

Other Professional Positions

2009-2010	Tomosynthesis Consultant	Surgical Tools LLC, AZ
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Committee Service

National and International

2009	Multimodal Biomedical Imaging IV Jan, 24-29, 2009	SPIE Photonics West 2009, Session Co-Chair
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2011	Multimodal Biomedical Imaging VI Jan, 22-27, 2011	SPIE Photonics West 2011, Session Co-Chair
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Professional Societies

2004-present	IEEE, Engineering in Medicine and Biology Society (IEEE-EMBS)	Member
2007-present	SPIE, The International Society for Optical Engineering	Member
2008-2010	OSA, The Optical Society of America	Member

Grant Review Activities

2009	Panel # 23 May 15 – July 15, 2009	National Institutes of Health (USA) Grant Reviewer
2010	Discovery Grant Review Committee Dec. 16 – Jan. 14, 2010	Natural Sciences and Engineering Research Council of Canada (Canada) Ad hoc Grant Reviewer
2010	Grants Management Department Apr. 28 – May 24, 2010	The Wellcome Trust (UK) Ad hoc Grant Reviewer
2011	“Ideas” Research Program Nov. 20 2011 – Jan. 24, 2012	Romanian National Council for Scientific Research Invited Grant Reviewer

Editorial Activities

- IEEE Transactions on Medical Imaging (TMI)
- IEEE Transactions on Biomedical Engineering (TBME)
- IEEE Transactions on Microwave Theory and Techniques (TMTT)
- IEEE Transactions on Antenna and Propagation (TAP)
- IEEE Antennas and Wireless Propagation Letters
- IEEE Transactions on Evolutionary Computation (TEC)
- IET Microwaves, Antennas & Propagation (IEE Proc. – Microwave, Ant. and Prop.)
- Journal of Optics A: Pure and Applied Optics (JOPA)
- Journal of Biomedical Optics (JBO)
- Optics Letters
- Optics Express (OE)
- Biomedical Optics Express (BOE)
- Journal of Applied Physics (JAP)
- Physics in Medicine and Biology (PMB)
- Philosophical Transactions A
- IEEE International Symposium on Biomedical Imaging 2009-2011
- Medical Image Analysis
- Journal of Digital Imaging
- BioMedical Engineering OnLine
- Optics Communications
- International Journal of Biomedical Imaging

Other Editorial Roles

2008-present	Associate Editor	Medical Physics
2010-present	Associate Editor	Int. Journal of Microwave Science and Tech.

Honors and Prizes

1996,1997	Motorola Scholarship	Univ. Elec. Sci&Tech of China
1998	Shanghai Bell Scholarship	Univ. Elec. Sci&Tech of China
1998	Outstanding Award of UESTC	Univ. Elec. Sci&Tech of China
1999	Excellent Thesis Award of UESTC	Univ. Elec. Sci&Tech of China
1999	Honored Graduate of China Ministry of Electronics Industry	China Ministry of Electronics Industry
2000	Herbert Darling Fellowship	Thayer School of Eng., Dartmouth College
2004	IEEE EMBS Travel Award	IEEE EMBS

Report of Funded and Unfunded Projects

Funding Information

Past

2009-2010 Imaging breast tumors with diffuse optical imaging and harmonic compression
Harvard Catalyst Pilot Grant (\$50,000)

Principal Investigator

This study aims to uncover robust and high-contrast tissue optical biomarkers for breast cancer diagnosis by exploring the hemodynamic responses enhanced by a harmonic compression

2009-2009 Intra-operative specimen tomosynthesis for margin assessment in breast surgery (PI: Emre Toker)
NIH R43-CA139635

Consultant

This research study targets the development of the first portable intra-operative digital specimen tomosynthesis system for rapid and accurate 3D radiographic margin assessment of surgically excised breast tissue specimens during breast-conserving surgery (BCS)

Current

2008-2013 3D Optical Imaging and Digital X-ray of Breast Lesions (PI: David Boas)
NIH R01-CA097305

Co-Investigator (key)

This study aims to improve the accuracy and effectiveness of mammographic screening techniques by combining functional optical imaging with structural x-ray mammography.

2009-2012 Tomographic optical breast imaging (TOBI) to monitor response to neoadjuvant therapy in breast cancer (PI: Steve Isakoff)
Komen Foundation KG090591

Collaborator

In this project, we use tomographic optical breast imaging to detect early responses in neoadjuvant therapy treatment of breast tumors.

2010-2015 Integrated 3D X-ray and dynamic tomographic optical breast imaging system (PI: David Boas)
NIH R01-CA142575

Co-Investigator (key)

This study aims to develop an integrated diffuse optical imaging and X-ray mammography system using fast optical instrument and radiolucent optical probes for improved breast cancer diagnosis

2011-2012 Cell phone-based near-infrared camera for high-risk neonates
Bill & Melinda Gates Foundation Grand Challenges Explorations OPP1035992 (\$100,000)

Principle Investigator

We propose to develop a portable, low-cost mobile-phone-based near-infrared camera for monitoring brain injury in neonates. If successful, it could help identify and monitor high-risk newborns in resource-limited regions.

2011-2013 Combined optical and mammographic imaging of breast function and structure for early cancer detection
Massachusetts Life Sciences Center, Cooperative Research Matching Grants (\$1,000,000)

Principle Investigator

We will collaborate with medical equipment provider, Philips Healthcare (Andover, MA), to develop a combined optical and mammographic imaging device that can make multi-modality breast imaging readily available for over 9,000 x-ray systems in the US.

Current Unfunded Projects

2007-present Principle investigator / Accurate and efficient 3D image-based mesh generation
We extend our previous works on image-based mesh generation to develop anatomically accurate and computational efficient 3D meshing algorithms and open-source software.

2009-present Principle investigator / Next generation optical imaging modeling methods powered by many-core processors (*submitted as an NIH R01 proposal in June 2011*)
The goal in this project is to develop the next generation optical modeling algorithms, including Monte Carlo method, RTE solvers and FEM solvers, designed for modern many-core processors and heterogeneous computing platforms.

2011-present Collaborator / Optical-biological interaction for micro-OPID (*submitted to Wyss institute in June 2011*)
This project aims to establish the preliminary feasibility of optical identification (OPID) silicon chips that can be implanted at the capillary/cellular level of tissues.

Report of Local Teaching and Training

Teaching of Students in Courses

2008	HST.563 Optical Imaging/Breast Cancer Monitoring Lab MIT/HST graduate students	Bldg. 149, Charlestown Navy Yard 2-hour session (lecture and demo)
2009	2009 HST Summer Biomedical Optics Lecture Series HST summer students (undergraduate)	Thier 1, Wellman Center, Boston 1-hour lecture and discussions

Local Invited Presentations

- 2008 Combined diffuse optical tomography with tomosynthesis for breast cancer imaging (Invited Talk)
Department of Radiation Oncology, Dana Farber/ Brigham and Women's Cancer Center
- 2009 Multi-modal Breast Imaging Using Tomosynthesis and Diffuse optical tomography (Multidisciplinary Breast Rounds)
Gillette Center for Breast Cancer

Report of Regional, National and International Invited Teaching and Presentations

Invited Presentations and Courses

Regional

- Oct. 2009 “Massively parallel Monte Carlo simulation with graphics processing units (GPU)” / Invited talk
UCSD Radiation Oncology Academic Seminar Series

National

- Oct. 2009 “Multimodal breast cancer imaging” / Invited talk
Boston, MA, Gordon-CenSSIS Research and Industrial Collaboration Conf. RICC’09
- Sep. 2010 “Voxel- and mesh-based Monte Carlo software - MCX and MMC” / Invited talk
Irvine, CA, Virtual Photonics Workshop 2010

International

- Apr. 2010 “Imaging benign and malignant breast lesions with combined optical imaging and tomosynthesis” / Invited talk
Miami, FL, Biomedical Optics Topical Meeting (BIOMED) 2010, OSA
- Jul. 2010 “Iso2mesh – a one-liner 3D mesh generator” / Invited talk
Hanover, NH, Image Guided Spectroscopy Symposium
- Oct. 2011 “Using compositional-priors in optical tomography improves breast tumor diagnosis” / Invited talk
Troy, NY, IPRPI Workshop on Diffuse Optical Imaging
- Nov. 2011 “Use of structural priors in multi-modal optical breast imaging” / Invited talk
Boston, MA, ADSA6: 6th workshop on algorithm development for security applications

Report of Technological and Other Scientific Innovations

- US Patent 7825667, **Fang Q**, Meaney PM, Paulsen KD, (Nov.2,2010) “Microwave imaging system and processes, and associated software products”
As a member of the microwave imaging lab, my advisors and I had developed a microwave breast imaging system, including the hardware and efficient image reconstruction algorithms. With this system, we were able to demonstrate, for the first time, the clinical utility of microwave imaging for breast cancer detection. The computational efficiency of the algorithms outperforms the traditional methods significantly. The proposed methods related to this patent are now adopted in multiple labs across the world.

Report of Scholarship

Publications

Peer reviewed publications in print or other media

- Research investigations
 - Meaney PM, Paulsen KD, Fanning MW, Li D, **Fang Q**, “Image accuracy improvements in microwave tomographic thermometry: phantom experience”, *International Journal of Hyperthermia*, vol. 19, pp. 534-550, 2003.
 - Meaney PM, Fanning MW, Paulsen KD, Li D, Pendergrass SA, **Fang Q**, Moodie KL, “Microwave thermal imaging: Initial in vivo experience with a single heating zone”, *International Journal of Hyperthermia*, vol. 19, pp. 617-641, 2003.
 - **Fang Q**, Meaney PM, Geimer SD, Streltsov AV, Paulsen KD, “Microwave image reconstruction from 3D fields coupled to 2D parameter estimation,” *IEEE Transactions on Medical Imaging*, vol. 23, pp. 475-484, Apr. 2004.
 - **Fang Q**, Meaney PM, Paulsen KD, “Microwave image reconstruction of tissue property dispersion characteristics utilizing multiple frequency information”, *IEEE Transactions on Microwave Theory and Techniques*, vol. 52, No. 8, pp. 1866-1875, Aug. 2004.
 - **Fang Q**, Meaney PM, Paulsen KD, “Singular value analysis of the Jacobian matrix in microwave image reconstruction,” *IEEE Transactions on Antenna and Propagation*, vol. 54, No. 8, pp.2371-2380, Aug. 2006.
 - **Fang Q**, Meaney PM, Paulsen KD, “The multi-dimensional phase unwrapping integral and applications to microwave tomographical image reconstruction,” *IEEE Transaction on Image Processing*, vol 15, No. 11, pp. 3311-3324, Nov. 2006.
 - Carp SA, Kauffman T, **Fang Q**, Rafferty E, Moore R, Kopans D, Boas D, “Compression-induced changes in the physiological state of the breast as observed through frequency domain photon migration measurements,” *Journal of Biomedical Optics*, vol. 11, issue 6, Nov./Dec. 2006.
 - Meaney PM, **Fang Q**, Rubaek T, Paulsen KD, “Log transformation benefits parameter estimation in microwave tomographic imaging,” *Medical Physics*, 34 (6):2014-23, Jun 2007
 - Meaney PM, Fanning MW, Raynolds T, Fox CJ, **Fang Q**, Kogel CA, Poplack SP, Paulsen KD, "Initial Clinical Experience with Microwave Breast Imaging in Women with Normal Mammography," *Acad Radiol.*, vol. 14, pp. 207-218, 2007.
 - Boverman G, **Fang Q**, Carp SA, Miller EL, Brooks DH, Selb J, Moore RH, Kopans DB, Boas DA, "Spatio-Temporal Imaging of the Hemoglobin in the Compressed Breast With Diffuse Optical Tomography," *Phys. Med. Biol.* 52 3619-3641, 2007.
 - Boverman G, Miller EL, Brooks DH, **Fang Q**, Boas DA, "Estimation and Statistical Bounds for Three-Dimensional Polar Shapes in Diffuse Optical Tomography," *IEEE Transactions on Medical Imaging*, vol. 27, issue 6, pp.752 – 765, Jun 2008.
 - Carp SA, Selb J, **Fang Q**, Moore R, Kopans DB, Rafferty E, Boas DA, “Dynamic functional and mechanical response of breast tissue to compression,” *Optical Express*, vol. 16, Issue 20, pp. 16064-16078, 2008.
 - **Fang Q**, Sakadžić S, Ruvinskaya L, Devor A, Dale AM, Boas DA, "Oxygen advection and diffusion in a three dimensional vascular anatomical network," *Optical Express*, featured article, vol. 16, Issue 22, pp. 17530-17541, 2008.
 - **Fang Q**, Carp SA, Selb J, Boverman G, Zhang Q, Kopans DB, Moore RH, Brooks DH, Miller EL,

Boas DA, "Combined optical Imaging and mammography of the healthy breast: optical contrast derives from breast structure and compression," *IEEE Trans. Medical Imaging*, vol. 28, issue 1, pp. 30 – 42, Jan. 2009.

- Zhu G, Popovic M, **Fang Q**, "Microwave-induced thermoacoustics: assisting microwave tomography," *IEEE Trans. on Magnetics*, vol. 45, issue 3, pp. 1654-1657, 2009.
- **Fang Q** and Boas D, "Monte Carlo simulation of photon migration in 3D turbid media accelerated by graphics processing units," *Optics Express*, featured article, vol. 17, issue 22, pp. 20178-20190, 2009.
- **Fang Q**, Meaney PM, Paulsen KD, "Viable three-dimensional microwave imaging, theory and experiments," *IEEE Trans. on Antennas and Propagation*, vol. 58, No. 2, pp. 449– 458, 2010.
- **Fang Q**, Moore RH, Kopans DB, Boas DA, "Compositional-prior-guided image reconstruction algorithm for multi-modality imaging," *Biomedical Optics Express*, vol. 1, issue 1, pp. 223-235, 2010.
- **Fang Q**, "Mesh-based Monte Carlo method using fast ray-tracing in Plücker coordinates," *Biomedical Optics Express*, vol. 1, issue 1, pp. 165-175, 2010.
- **Fang Q**, Selb J, Carp SA, Kopans DB, Moore RH, Brooks DH, Miller EL, Boas DA, "Combined optical and tomosynthesis breast imaging," *Radiology*, (cover article) vol. 258, No. 1, pp. 89-97, 2011.
- **Fang Q**, "Comment on 'A study on tetrahedron-based inhomogeneous Monte-Carlo optical simulation'," *Biomed. Opt. Express*, vol. 2, issue 5, pp. 1258-1264, 2011.
- Baraghis E, Devor A, **Fang Q**, Srinivasan VJ, Wu W, Boas D and Sakadžić S, "Two-photon microscopy of cortical NADH fluorescence intensity changes: correcting contamination from the hemodynamic response," *J Biomed Opt* 16, 106003 2011.

▪ Peer-reviewed conference papers

- **Fang Q**, Meaney PM, Paulsen KD, "Phase unwrapping in the presence of scattering nulls and applications to microwave imaging," *Proceeding (425) Antennas, Radar, and Wave Propagation*, Jul. 2004
- **Fang Q**, Carp SA, Selb J, Moore RH, Kopans DB, Miller EL, Brooks DH, Boas DA, "Spectrally Constrained Optical Breast Imaging with Co-registered X-Ray Tomosynthesis," *OSA Biomedical Optics (BIOMED) conference*, 2008.
- **Fang Q**, Carp SA, Selb J, Moore RH, Kopans DB, Miller EL, Brooks DH, Boas DA, "A multi-modality image reconstruction platform for diffuse optical tomography," *OSA Biomedical Optics (BIOMED) conference*, 2008.
- Zhu G, Popovic M, **Fang Q**, "Microwave-Induced Thermoacoustics: Assisting Microwave Tomography," *13th Biennial IEEE Conference on Electromagnetic Field Computation*, OB2-1, Athens, May 2008
- **Fang Q** and Boas D, "Tetrahedral mesh generation from volumetric binary and gray-scale images", *IEEE International Symposium on Biomedical Imaging (ISBI'09)*, 1142-1145, 2009.
- **Fang Q**, Carp SA, Moore RH, Kopans DB, Boas DA, "Imaging Benign and Malignant Breast Lesions with Combined Optical Imaging and Tomosynthesis," *OSA Biomedical Optics (BIOMED) conference (invited)*, Apr. 2010.
- **Fang Q** and Boas D, "GPU accelerated Monte Carlo simulation for 3D photon migration", *OSA Biomedical Optics (BIOMED) conference*, Apr. 2010.

Non-peer reviewed scientific or medical publications/materials in print or other media

- Proceedings of meetings or other non-peer reviewed research publications
 - Meaney PM, Fanning MW, **Fang Q**, Paulsen KD, "Initial experience with microwave imaging system for monitoring temperature change in an animal model," 23rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Istanbul, Turkey, paper # 889, 2001.
 - Meaney PM, **Fang Q**, Geimer SD, Streltsov AV, Paulsen KD, "3D scalar microwave image reconstruction algorithm," International Microwave Symposium, Seattle, WA, pp. 2269-2272, 2002.
 - Meaney PM, Paulsen KD, Li D, Fanning MW, **Fang Q**, Pendergrass SA, "Microwave breast imaging," European Medical and Biological Engineering Conference, Vienna, Austria, pp. 1102-1103, 2002.
 - Meaney PM, Li D, **Fang Q**, Yagnamurthy NK, Paulsen KD, "Evaluation of the Jacobian Matrix for Two Different Gauss-Newton Image Reconstruction Formulations," Progress in Electromagnetic Research Symposium, Cambridge, MA, 2002.
 - Meaney PM, Paulsen KD, Fanning MW, Li D, Yagnamurthy NK, **Fang Q**, Pendergrass SA, Raynolds T, "Exploiting tissue properties in non-invasive tomographic imaging: microwave and alternative modalities compared," North American Hyperthermia Annual Meeting, Reno, NV, 2002.
 - Meaney PM, Li D, **Fang Q**, Pendergrass SA, Fanning MW, Paulsen KD, "Second generation microwave imaging system: phantom and early clinical experience," Progress in Electromagnetic Research Symposium, Honolulu, Hawaii, 2003.
 - Meaney PM, Pendergrass SA, Li D, **Fang Q**, Cecere L, Raynolds T, Soho SK, Kogel CA, Poplack SP, Paulsen KD, "Microwave breast imaging: preliminary study of patients with abnormal findings," World Congress on Medical Physics and Biomedical Engineering, Sydney, Australia, paper #246.01.01A, 2003.
 - Meaney PM, **Fang Q**, Fanning MW, Pendergrass SA, Raynolds T, Fox CJ, Paulsen KD, "Microwave breast imaging with an under-determined reconstruction parameter mesh," 2004 IEEE International Symposium on Biomedical Imaging from Nano to Macro, Arlington, VA, 2004 pp. 1369- 1372 Vol. 2.
 - Pendergrass SA, Fanning MW, **Fang Q**, Fox CJ, Raynolds T, Meaney PM, Paulsen KD, "Analysis of maximum phase projection data for improvement of microwave imaging background media," IEEE Northeast Bioengineering Conference, Springfield, MA, pp. 57-58, 2004.
 - Meaney PM, Fox CJ, **Fang Q**, Kogel C, Poplack SP, Pogue BW, Paulsen KD, "Comparison of fibroglandular tissue distributions for Microwave Tomographic Breast Images with Complementary MR T2 Weighted Images," Annual International Conference of the IEEE Engineering in Medicine and Biology Society, San Francisco, pp. 1314-1316, 2004.
 - Meaney PM, **Fang Q**, Pendergrass SA, Fanning MW, Raynolds T, Fox CJ, Paulsen KD, Poplack SP, "Clinical microwave breast imaging: early results - work in progress," URSI International Symposium on Electromagnetic Theory, Pisa, Italy, pp. 900-902, 2004.
 - Meaney PM, **Fang Q**, Fanning MW, Raynolds T, Robbie P, Paulsen KD, "Microwave imaging using the adjoint method: facilitating advances in software and hardware development," 2nd International Conference on Electromagnetic Near-Field Characterization and Imaging, Barcelona, Spain, pp. 67-71, June, 2005.
 - Meaney PM, **Fang Q**, Paulsen KD, "Data collection strategies and their impact on 3D microwave

imaging of the breast," IEEE AP-S International Symposium, Washington, DC, Session 27, paper # 4, 2005.

- Meaney PM, **Fang Q**, Raynolds T, Fanning MW, Potwin L, Fox CJ, Paulsen KD, "3D microwave breast tomography: 3D data acquisition and algorithm development," 16th International Zurich Symposium on Electromagnetic Compatibility, Topical Meeting on Biomedical EMC, pp. 49-52, Zurich, Switzerland, February, 2005.
 - Meaney PM, **Fang Q**, Kogel CA, Poplack SP, Kaufman PA, Paulsen KD, "Microwave imaging for neoadjuvant chemotherapy monitoring," European Conference on Antennas and Propagation, Nice, France, 2006 (paper # 365072).
 - Meaney PM, **Fang Q**, Paulsen KD, "Single Value Decomposition and Degree-of-Ill-Posedness Assessment in Microwave Imaging," Progress in Electromagnetic Research Symposium, p. 360, Cambridge, MA, 2006.
 - **Fang Q**, Boas D, Boverman G, Zhang Q, Kauffman T, "Nonlinear image reconstruction algorithm for diffuse optical tomography using iterative block solver and automatic mesh generation from tomo-synthesis images," Proceedings of SPIE, vol. 6081, pp. 60810O.1-60810O.10, Feb., 2006
 - Boverman G; Miller EL; Brooks DH; **Fang Q**; Carp SA; Selb J; Boas DA, "Reconstruction of tissue dynamics in the compressed breast using multiplexed measurements and temporal basis functions," Proceedings vol. 6434, Feb, 2007
 - **Fang Q**, Selb J, Carp SA, Boverman G, Kopans DB, Moore RH, Boas DA, "Clinical Data Analysis for the Combined Optical and Tomosynthesis Breast Imaging," Proceedings of SPIE, vol. 6431, Feb., 2007
- Magazine article
 - **Fang Q**, "Multi-modality breast imaging combining structure and function in breast cancer diagnosis", Diagnostic Imaging Europe, Vol. 27 No. 7, 13-16, 2011.
 - Book chapters
 - Meaney PM, **Fang Q**, "Chapter 7. Microwave imaging: A model-based approach", Alternative Breast Imaging-Four Model-Based Approaches, Paulsen KD, Meaney PM, Gilman L(Eds.), Kluwer, 2004.
 - **Fang Q**, Carp S, Selb J, Boas D, "Chapter 9. Optical Imaging and X-ray Imaging", Translational multimodality Optical Imaging, Azar FS, Intes X (Eds.), Artech House, Norwood, 2008

Thesis

Q. Fang, "Computational methods for microwave medical imaging," Ph.D. dissertation, Dartmouth College, Hanover, NH, 2004

Thesis Committee: Paul M. Meaney, Keith D. Paulsen, William Lotko, Eric L. Miller

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings

- **Fang Q**, Carp SA, Selb J, Moore R, Kopans DB, Miller EL, Brooks DH, Boas DA, "Imaging healthy and tumor breasts with spectrally constrained optical imaging with co-registered tomosynthesis," Biomedical Optics Topical Meeting (BIOMED) 2008, OSA, Abstract#BsuB2, St. Petersburg, Mar. 2008

- Carp CA, Selb J, **Fang Q**, Moore R, Kopans DB, Rafferty E, Boas DA, “Dynamic Functional and Mechanical Response of Breast Tissue to Compression,” Biomedical Optics Topical Meeting (BIOMED) 2008, OSA, Abstract#BsuB7, St. Petersburg, Mar. 2008
- **Fang Q**, Carp SA, Selb J, Moore R, Kopans DB, Miller EL, Brooks DH, David A. Boas, "A Multi-Modality Image Reconstruction Platform for Diffuse Optical Tomography," Optics Topical Meeting (BIOMED) 2008, OSA, St. Petersburg, Poster, Mar. 2008
- **Fang Q**, Carp SA, Selb J, Moore R, Kopans DB, David A. Boas, "Clinical study of malignant and benign breast lesions using a combined diffuse optical imaging and tomosynthesis," SPIE BIOS 2009, Abstract#7171-20, San Jose, Jan. 2009
- Carp SA, Nadege R, **Fang Q**, Kopans DB, Boas DA, “Mechanical and metabolic markers in compressed breast tissue,” SPIE BIOS 2009, Abstract#7174-35, San Jose, Jan. 2009
- **Fang Q**, Ou W, Radhakrishnan H, Huppert TJ, Hamalainen M, Franceschini MA, Boas DA, “A state-space approach for modeling simultaneous MEG and diffuse optical imaging measurements,” Poster #F-AM-1535, Human Brain Mapping 2009, San Francisco, June 2009

Narrative Report (limit to 500 words)

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I am a biomedical engineer working in the field of near-infrared (NIR) imaging with specific focuses on breast cancer, human brain functions and small animal models. During my PhD work, I had contributed to developing clinically viable 3D microwave tomography. At MGH/Harvard, I have been leading a project developing multi-modal breast imaging techniques for early breast cancer diagnosis. My research at Harvard also includes investigations to compression-induced dynamic tissue biomarkers, ultra-portable NIR imaging devices, and novel computational methods.

In 2005 and 2009, I mentored students for the HST summer program. I gave lectures on the fundamental physics and the engineering challenges of diffuse optical imaging and breast cancer detection and guided undergraduate students in gaining hands-on experience in cutting-edge research. My colleagues and I had also developed lab demo and educational materials for the HST/MIT class HST.563 (Imaging Biophysics and Clinical Applications), giving lectures on biophysics and modeling techniques for optical imaging.

My future research goals include developing optical imaging methods for cancer diagnosis, translational clinical research for multi-modality and low-cost imaging systems, and high-performance computing for imaging applications.