

**THE UNIVERSITY OF TEXAS**

**FULL NAME:** Mia Kathleen Markey**TITLE:** Associate Professor**DEPARTMENT:** Biomedical Engineering**CITIZENSHIP:** U.S.**EDUCATION:**

Illinois Mathematics and Science Academy Aurora, Illinois	N/A	Diploma	1994
Boston University Boston, MA	Biochemistry & Molecular Biology	N/A	1994-1996
Carnegie Mellon University Pittsburgh, PA	Biological Sciences / Computer Sciences Track (“computational biology”)	B.S.	1998
Duke University Durham, NC	Biomedical Engineering	Ph.D.	2002
Duke University Durham, NC	Bioinformatics & Genome Technology	Certificate	2002

**PROFESSIONAL REGISTRATION:** None**CURRENT AND PREVIOUS ACADEMIC POSITIONS:**

The University of Texas at Austin (UT Austin) UT Austin	Assistant Professor, Department of Biomedical Engineering Faculty Participant, Center for Computational Biology and Bioinformatics	2002-2006 2003- present
UT Austin	Member, Institute of Cellular and Molecular Biology	2003- present
UT Austin	Member, Graduate Studies Committee, Cellular and Molecular Biology	2003- present
UT Austin	Program Faculty, NSF IGERT	2004-2007
The University of Texas Department of Biomedical Engineering (inter-institutional) UT Austin	Assistant Professor  Track Representative, Bioinformatics and Computational Biology Track, Cellular and Molecular Biology	2006-2008  2006- present
Gulf Coast Consortia	Program Faculty, NLM informatics training grant	2007- present
UT Austin	Co-Director, Graduate Portfolio Program in Imaging Science	2007- present

UT Austin	Associated Faculty, Division of Statistics and Scientific Computation	2008-present
The University of Texas Department of Biomedical Engineering (inter-institutional)	Associate Professor	2008-present
The University of Texas Department of Biomedical Engineering (inter-institutional)	Minority Liaison Officer (Graduate Program)	2008-present
The University of Texas Department of Biomedical Engineering (inter-institutional)	Chair, Graduate Studies Committee	2009-present
UT Austin	Member, Graduate Studies Committee, Electrical and Computer Engineering	2009-present

### HONORS AND AWARDS:

2009	Senior Member, IEEE
2009	3 <sup>rd</sup> place best paper, New Engineering Educators Division, American Association for Engineering Educators Annual Conference and Exposition
2008	IMSA Alumni Leadership Award
2007	Recent Alumni Award, Carnegie Mellon University
2007	Silver Award for Teaching with Technology, Innovative Instructional Technologies Award Program, Office of the Provost & Center for Instructional Technologies, UT Austin
2007	J. A. Halter Award in Bioinformatics and Computational Biology Houston Society for Engineering in Medicine and Biology
2006	American Medical Informatics Association New Investigator Award
2006	American Association for Engineering Education Gulf-Southwest Section Outstanding Teaching Award
2006	UT Austin Graduate Engineering Council Faculty Appreciation Award
2006	UT Austin Student Engineering Council BME Faculty Appreciation Award
2004-2008	NIH Clinical Research Loan Repayment Program recipient
2003-2008	Faculty Travel Grants, UT Austin
2001-2002	Predoctoral Traineeship, United States Army Medical Research and Material Command (Breast Cancer Research Program)
2001-2002	Dissertation Research Award, Susan G. Komen Breast Cancer Foundation
1998-2001	Graduate fellowship, Whitaker Foundation Special Opportunities Award, Biomedical Engineering, Duke University
1998	Graduated with College Honors, Honors in Research Biology, Outstanding Undergraduate Research, & Senior Leadership Award from Carnegie Mellon
1996-1998	Small Undergraduate Research Grants (4), Carnegie Mellon University
1997	Travel Awards from Carnegie Mellon University
1997	4th Place Sigma Xi poster competition, Carnegie Mellon University
1996	Summer Undergraduate Research Program at Carnegie Mellon University
1996	College Honors, Boston University
1994-1998	Robert C. Byrd Honors Scholarship

### MEMBERSHIPS IN PROFESSIONAL AND HONORARY SOCIETIES:

American Association for the Advancement of Science (AAAS)  
 American Medical Informatics Association (AMIA)  
 Biomedical Engineering Society (BMES)

IEEE Engineering in Medicine and Biology Society (EMBS) (Senior Member, IEEE)  
 International Society for Optical Engineering (SPIE)  
 Medical Image Perception Society (MIPS)  
 American Association of Physicists in Medicine (AAPM)

#### UNIVERSITY COMMITTEE ASSIGNMENTS:

Departmental-	Member, Executive Committee, Graduate Studies Committee Biomedical Engineering	2004-present
	Member, Undergraduate Curriculum Committee Biomedical Engineering	2004-present
	Member, U.S.A Graduate Admissions Committee Biomedical Engineering	2002-present
	Member, Graduate Curriculum Committee Biomedical Engineering	2002-2004
School-	Member, Information Technology Committee Cockrell School of Engineering	2002-2007
	Member, Equal Opportunity in Engineering Committee Cockrell School of Engineering	2007-present
University-	Member, Information Technology Committee (C13) Standing Committee of the General Faculty	2006-2008
	Track Representative of Bioinformatics and Computational Biology Track, Graduate Studies Committee	2006-2008
	Cell and Molecular Biology Member, Executive Committee, Graduate Studies Committee, Cell and Molecular Biology	2006-2008

#### PROFESSIONAL SOCIETY AND MAJOR GOVERNMENTAL COMMITTEES:

##### *Grant Proposal reviews (government agencies)*

- National Institutes of Health
  - X-50 EB03-007 (July 2003)
  - SBIB-J (90) S (November 2004)
  - Biomedical Imaging Technology Study Section (temporary member; June 2004)
  - ZCA1 SRRB-9 (M1) (March 2004)
  - ZRG1 SBMI-R-12 (June 2005)
  - Biomedical Imaging Technology Study Section (temporary member; June 2005)
  - Biomedical Imaging Technology Study Section (temporary member; June 2009)
- National Science Foundation
  - IGERT pre-proposals (June 2006)
  - IGERT proposals (December 2006)
  - IGERT pre-proposals (June 2008)

##### *Elected Positions in Professional Societies*

- Genomics Working Group, American Medical Informatics Association: Chair-Elect (2004), Chair (2005-2006), Past-Chair (2007)
- Medical Imaging Systems Working Group, American Medical Informatics Association: Member of Advisory Board (2006-present)

*Invited Positions in Professional Societies*

- subcommittee on Computer-assisted detection and diagnosis (CAD) in medical imaging, American Association of Physicists in Medicine (2008-present)
- Working Group Steering Committee, American Medical Informatics Association (2008-present)

**OTHER PROFESSIONAL SERVICE ACTIVITIES:***Manuscript Reviews*

Approximately 100 reviews since 2002 for venues such as *Medical Physics*, *IEEE Transactions on Medical Imaging*, *IEEE Transactions on Image Processing*, *Artificial Intelligence in Medicine*, *BMC Bioinformatics*, *Annals of Biomedical Engineering*, *Journal of Biomedical Informatics*, *Computers in Biology and Medicine*, *Proteomics*, *IEEE Transactions on Information Technology in Biomedicine*

*Editorial Responsibilities*

- *Ad hoc* associate editor for *Medical Physics* (2005-present)
- Member of Editorial Board of *Cancer Informatics* (2006-present)
- Associate guest editor (along with Tadaaki Hiruki and John A. Smith; and Peter Tarczy-Hornoch as guest editor) of a special issue of the *Journal of Biomedical Informatics* (February 2007)
- Member of Editorial Board of *Breast Cancer: Basic and Clinical Research* (2007-present)

*Grant Proposal Reviews (non-government agencies)*

- Netherlands Organisation for Scientific Research
  - 1 proposal, 2004
- San Antonio Life Sciences Institute (SALSI)
  - 1 proposal, 2004; 1 proposal, 2005
- Science Foundation Arizona
  - Site visit chair 2008
- Technology Foundation STW (The Netherlands)
  - 1 proposal, 2009
- Innovation and Technology Commission (Hong Kong)
  - 1 proposal, 2009

*Committees*

- Program Committee, 4<sup>th</sup> IEEE International Symposium on Bioinformatics and Bioengineering (2004)
- Scientific Program Committee, American Medical Informatics Association 2005 Annual Symposium
- Program Committee, 6<sup>th</sup> IEEE International Symposium on Bioinformatics and Bioengineering (2006)

*Panels, Session Chairing, etc.*

- American Medical Informatics Association 2003 Annual Symposium, corporate roundtable
- American Medical Informatics Association 2003 Annual Symposium, chaired session on “Microarrays”
- Data Integration in the Life Sciences 2005, panel organizer and panelist, “The Electronic Health Record of the Future: Integrating Molecular Information”
- American Medical Informatics Association 2005 Annual Symposium, corporate roundtable

- American Medical Informatics Association 2005 Annual Symposium, panel organizer and panelist, “Towards Resource Sharing: Challenges and Opportunities for Imaging and Genomics Databases”
- American Medical Informatics Association 2005 Annual Symposium, chaired session on “Individual Differences and Individualized Care”
- American Medical Informatics Association 2005 Annual Symposium, chaired session on “Methods for Translational and Genomic Data”
- American Medical Informatics Association 2006 Spring Congress, moderated session on “Translational Bioinformatics: Integrating the Phenome with the Genome I - The -omics Perspective”
- Asilomar Conference on Signals, Systems, and Computers 2006, chair for session on “Computer-aided Diagnosis”
- Radiological Society of North America 2006 annual meeting, moderator for session on “Physics (CAD: Various Abnormalities)”
- 24th Annual Houston Conference on Biomedical Engineering Research, co-chaired session on “Bioinformatics” (2007)
- American Medical Informatics Association 2007 Annual Symposium, corporate roundtable
- International Joint Conference on Neural Networks (IJCNN 2009), Atlanta, GA, USA, June 14-19, 2009, co-chaired session on “Computational Intelligence in Medical Diagnosis”

#### *Invited Talks*

- Seminar at Southern Illinois University 07/03/08
- Seminar at Iowa State University 07/11/08
- Seminar at University of Kansas 07/23/08

#### **COMMUNITY ACTIVITIES:**

2009-present	Alumni Interviewer, Duke University - Interviewed prospective undergraduates for admission to Duke
2003-present	Faculty Fellow, Division of Housing and Food Service, UT Austin
2003-2005	Faculty Mentor, College of Engineering, UT Austin
2002-present	Volunteer, Panelist, or Lecturer for several Austin-based community outreach programs ( <i>e.g.</i> , Expanding Your Horizons, Women in Engineering Program, Minority Introduction to Engineering) and campus organizations ( <i>e.g.</i> , Society of Women Engineers, Biomedical Engineering Society, Engineering Faculty Women’s Organization)
2001-2002	Planning Committee, Women In Science and Engineering (WISE), Duke University
2001-2002	Steering Committee, Expanding Your Horizons conference, North Carolina State University
2001-2002	Secretary, North Carolina Club of Carnegie Mellon Alumni Association
2000-present	Alumni Interviewer, Carnegie Mellon Admission Council (CMAC) - Interviewed prospective undergraduates for admission CMU
1999-2002	At-Large Cabinet Member, Illinois Mathematics and Science Academy Alumni Association (IAA)
1998-2002	Women And Mathematics (WAM) Mentoring Program, Durham NC - 2000-2002, Coordinating Team - 1999, Mentor Leader - 1998-2002, Mentor

**PUBLICATIONS:*****A. Refereed Archival Journal Publications***

- [001] M. V. Boland, **M. K. Markey**, R. F. Murphy, "Automated recognition of patterns characteristic of subcellular structures in fluorescence microscopy images", *Cytometry* 33:366-375 (November 1998).
- [002] **M. K. Markey**, M. V. Boland, R. F. Murphy, "Toward objective selection of representative microscopy images", *Biophysical Journal* 76:2230-2237 (April 1999).
- [003] G. D. Tourassi, **M. K. Markey**, J. Y. Lo, C. E. Floyd, Jr., "A neural network approach to breast cancer diagnosis as a constraint satisfaction problem", *Medical Physics* 28:804-811 (May 2001).
- [004] G. D. Tourassi, E. D. Frederick, **M. K. Markey**, C. E. Floyd, Jr., "Application of the mutual information criterion for feature selection in computer-aided diagnosis", *Medical Physics* 28:2394-2402 (December 2001).
- [005] J. Y. Lo, **M. K. Markey**, J. A. Baker, C. E. Floyd, Jr., "Cross-institutional evaluation of BI-RADS predictive model for mammographic diagnosis of breast cancer", *American Journal of Roentgenology* 178:457-463 (February 2002).
- [006] **M. K. Markey**, J. Y. Lo, R. Vargas-Voracek, G. D. Tourassi, C. E. Floyd, Jr., "Perceptron error surface analysis: a case study in breast cancer diagnosis", *Computers in Biology and Medicine* 32:99-109 (March 2002).
- [007] **M. K. Markey**, J. Y. Lo, C. E. Floyd, Jr., "Differences between the computer-aided diagnosis of breast masses and that of calcifications", *Radiology* 223:489-493 (May 2002). (The Radiological Society of North America highlighted this study in a [press release](#), April 30, 2002)
- [008] **M. K. Markey**, J. Y. Lo, G. D. Tourassi, C. E. Floyd, Jr., "Self-organizing map for cluster analysis of a breast cancer database", *Artificial Intelligence in Medicine* 27:113-127 (February 2003).
- [009] **M. K. Markey**, G. D. Tourassi, C. E. Floyd, Jr., "Decision tree classification of proteins identified by mass spectrometry of blood serum samples from people with and without lung cancer", *Proteomics* 3:1678-1679 (September 2003). (short communication)
- [010] S. Y. Park, T. Collier, J. Aaron, **M. K. Markey**, R. Richards-Kortum, K. Sokolov, N. Mackinnon, C. MacAulay, L. Coghlan, A. Milbourne, M. Follen, "Multispectral digital microscopy for *in vivo* monitoring of oral neoplasia in the hamster cheek pouch model of carcinogenesis", *Optics Express* 13:749-762 (February 2005).
- [011] S. Gupta, **M. K. Markey**, "Correspondence in texture features between two mammographic views", *Medical Physics* 32:1598-1606 (June 2005).
- [012] **M. K. Markey**, G. D. Tourassi, M. Margolis, and D. M. DeLong, "Impact of missing data in evaluating artificial neural networks trained on complete data", *Computers in Biology and Medicine* 36:516-525 (May 2006).
- [013] S. Gupta, P. F. Chyn, **M. K. Markey**, "Breast cancer CADx based on BI-RADS™ descriptors from two mammographic views", *Medical Physics* 33:1810-1817 (June 2006).
- [014] M. P. Sampat, G. J. Whitman, T. W. Stephens, L. D. Broemeling, N. A. Heger, A. C. Bovik, **M. K. Markey**, "The reliability of measuring physical characteristics of spiculated masses on mammography", *British Journal of Radiology* 79:S134-S140 (December 2006).
- [015] M. S. Kim, G. P. Reece, E. K. Beahm, M. J. Miller, E. N. Atkinson, **M. K. Markey**, "Objective assessment of aesthetic outcomes of breast cancer treatment: measuring ptosis from clinical photographs", *Computers in Biology and Medicine* 37:49-59 (January 2007). (UT Austin highlighted this study in a [press release](#), January 29, 2007)
- [016] E. A. Fischer, M. A. Friedman, **M. K. Markey**, "Empirical comparison of tests for differential expression on time-series microarray experiments", *Genomics* 89:460-470 (April 2007).

- [017] M. P. Sampat, G. J. Whitman, A. C. Bovik, **M. K. Markey**, "Comparison of algorithms to enhance spicules of spiculated masses on mammography", *Journal of Digital Imaging* 21:9-17 (March 2008).
- [018] H. Shin, B. Sheu, M. Joseph, **M. K. Markey**, "Guilt-by-association feature selection: identifying biomarkers from proteomic profiles", *Journal of Biomedical Informatics* 41:124-136 (February 2008).
- [019] H. Shin, M. Mutlu, J. M. Koomen, **M. K. Markey**, "Parametric power spectral density analysis of noise from instrumentation in MALDI TOF mass spectrometry", *Cancer Informatics* 3:317-328 (September 2007).
- [020] M. S. Kim, W. N. Rodney, T. Cooper, C. Kite, G. P. Reece, **M. K. Markey**, "Toward quantifying the aesthetic outcomes of breast cancer treatment: comparison of clinical photography and colorimetry", *Journal of Evaluation in Clinical Practice* 15:20-31 (February 2009).
- [021] S. Y. Park, M. Follen, A. Milbourne, H. Rhodes, A. Malpica, N. MacKinnon, C. MacAulay, **M. K. Markey**, R. Richards-Kortum, "Automated image analysis of digital colposcopy for the detection of cervical neoplasia", *Journal of Biomedical Optics* 13:014029 (January 2008).
- [022] L. T. Nieman, C. W. Kan, A. Gillenwater, **M. K. Markey**, K. Sokolov, "Probing local tissue changes in the oral cavity for the early detection of cancer using oblique polarized reflectance spectroscopy: a pilot clinical trial", *Journal of Biomedical Optics* 13:024011 (March 2008).
- [023] M. P. Sampat, A. C. Bovik, G. J. Whitman, **M. K. Markey**, "A model-based framework for the detection of spiculated lesions on mammography", *Medical Physics* 35:0094-2405 (May 2008).
- [024] M. P. Sampat, A. C. Patel, Y. Wang, S. Gupta, C. W. Kan, A. C. Bovik, **M. K. Markey**, "Indices for three-class classification performance assessment – an empirical comparison", *IEEE Transactions on Information Technology in Biomedicine* 13:300-312 (May 2009).
- [025] M. P. Sampat, Z. Wang, S. Gupta, A. C. Bovik, and **M. K. Markey**. "Complex Wavelet Structural Similarity: a new image similarity index", *IEEE Transactions on Image Processing* (in press).
- [026] G. M. Pocock, R. G. Aranibar, N. J. Kemp, C. J. Specht, **M. K. Markey**, H. G. Rylander III, "The relationship between retinal ganglion cell axon constituents and fiber layer birefringence in the primate retinal nerve", *Investigative Ophthalmology and Visual Sciences* (in press).
- [027] G. S. Muralidhar, G. J. Whitman, T. M. Haygood, T. W. Stephens, A. C. Bovik, **M. K. Markey**, "Evaluation of stylus for radiographic image annotation", *Journal of Digital Imaging* (in press).

### ***B. Refereed Conference Proceedings***

- [001] M. V. Boland, **M. K. Markey**, R. F. Murphy, "Classification of protein localization patterns obtained via fluorescence light microscopy", *Proceedings of the 19th Annual International Conference of the IEEE Engineering in Medicine and Biology Society* (1997), pg. 594-597.
- [002] **M. K. Markey**, J. Y. Lo, G. D. Tourassi, C. E. Floyd, Jr., "Cluster analysis of BI-RADS descriptions of biopsy-proven breast lesions", *Medical Imaging 2002: Image Processing, Proceedings of the SPIE* 4684:363-370 (2002).
- [003] J. Y. Lo, M. A. Gavrielides, **M. K. Markey**, J. L. Jesneck, "Computer-aided classification of breast microcalcification clusters: merging of features from image processing and radiologists", *Medical Imaging 2003: Image Processing, Proceedings of the SPIE* 5032:882-889 (2003).
- [004] G. D. Tourassi, J. Y. Lo, **M. K. Markey**, "Validation of a constraint satisfaction neural network for breast cancer diagnosis: new results from 1,030 cases", *Medical Imaging 2003: Image Processing, Proceedings of the SPIE* 5032:207-214 (2003).
- [005] E. A. Fischer, J. Y. Lo, **M. K. Markey**, "Bayesian networks of BI-RADS descriptors for breast lesion classification", *Proceedings of the 26th Annual International Conference of the IEEE Engineering in Medicine and Biology Society* (2004), pgs. 3031-3034.

- [006] **M. K. Markey**, A. Patel, “Impact of missing data in training artificial neural networks for computer-aided diagnosis”, International Conference on Machine Learning and Applications (2004).
- [007] **M. K. Markey**, J. Y. Lo, “Issues in assessing multi-institutional performance of BI-RADS-based CAD systems”, Medical Imaging 2005: Image Processing, Proceedings of the SPIE 5747:858-865 (2005).
- [008] M. P. Sampat, A. C. Bovik, **M. K. Markey**, “Classification of mammographic lesions into BI-RADS shape categories using the beamlet transform”, Medical Imaging 2005: Image Processing, Proceedings of the SPIE 5747:16-25 (2005).
- [009] M. P. Sampat, G. J. Whitman, **M. K. Markey**, A. C. Bovik, “Evidence based detection of spiculated masses and architectural distortions”, Medical Imaging 2005: Image Processing, Proceedings of the SPIE 5747:26-37 (2005).
- [010] A. Patel, **M. K. Markey**, “Comparison of three-class classification performance metrics: a case study in breast cancer CAD”, Medical Imaging 2005: Image Perception, Observer Performance, and Technology Assessment, Proceedings of the SPIE 5749:581-589 (2005).
- [011] Q. Wu, M. Salganicoff, A. Krishnan, D. S. Fussell, **M. K. Markey**, “Interactive lesion segmentation on dynamic contrast enhanced breast MR using a Markov Model”, Medical Imaging 2006: Image Processing, Proceedings of the SPIE 6144:61444M1-8 (2006).
- [012] N. D. Bedard, M. P. Sampat, P. A. Stokes, **M. K. Markey**, “Reducing false-positive detections by combining two stage-1 computer-aided mass detection algorithms”, Medical Imaging 2006: Image Processing, Proceedings of the SPIE 6144: 61445U1-8 (2006).
- [013] S. Gupta, D. Zhang, M. P. Sampat, **M. K. Markey**, “Combining texture features from the MLO and CC views for mammographic CADx”, Medical Imaging 2006: Image Processing, Proceedings of the SPIE 6144: 61445V1-9 (2006).
- [014] M. P. Sampat, **M. K. Markey**, A. C. Bovik, “Measurement and detection of spiculated lesions”, 2006 IEEE Southwest Symposium on Image Analysis and Interpretation, pages 105-109. (invited paper)
- [015] M. P. Sampat, A. C. Bovik, **M. K. Markey**, G. J. Whitman, T. W. Stephens, “Toroidal Gaussian filters for detection and extraction of properties of spiculated masses”, 2006 International Conference on Acoustics, Speech, and Signal Processing, pages II-593-596.
- [016] M. P. Sampat, Z. Wang, **M. K. Markey**, G. J. Whitman, T. W. Stephens, A. C. Bovik, “Measuring intra- and inter-observer agreement in identifying and localizing structures in medical images”, 2006 International Conference on Image Processing, pages 81-84.
- [017] Q. Wu, G. J. Whitman, D. S. Fussell, **M. K. Markey**, “Registration of DCE MR images for computer-aided diagnosis of breast cancer”, Asilomar Conference on Signals, Systems, and Computers 2006, pages 826-830.
- [018] S. Gupta, **M. K. Markey**, J. K. Aggarwal, A. C. Bovik, “Three dimensional face recognition based on geodesic and Euclidean distances”, IS&T/SPIE Symposium on Electronic Imaging: Vision Geometry XV, Proceedings of the SPIE 6499: 64990D1-11 (2007).
- [019] S. Gupta, C. W. Kan, T. C. Lin, **M. K. Markey**, “Reducing variability in the output of artificial neural networks through output calibration”, Medical Imaging: Image Perception, Observer Performance, and Technology Assessment, Proceedings of the SPIE 6515: 65151E1-8 (2007).
- [020] N. Udpa, M. P. Sampat, M. S. Kim, G. P. Reece, **M. K. Markey**, “Objective assessment of the aesthetic outcomes of breast cancer treatment: toward automatic localization of fiducial points on digital photographs”, Medical Imaging 2007: Computer-aided Diagnosis, Proceedings of the SPIE 6514: 65142O1-9 (2007).
- [021] S. Gupta, M. P. Sampat, Z. Wang, **M. K. Markey**, A. C. Bovik, “Facial range image matching using the complex wavelet structural similarity metric”, IEEE Workshop on Applications of Computer Vision (2007).
- [022] S. Gupta, J. K. Aggarwal, **M. K. Markey**, A. C. Bovik, “3D face recognition founded on

the structural diversity of human faces”, IEEE Conference on Computer Vision and Pattern Recognition (2007).

[023] C. W. Kan, A. Y. Lee, N. Pham, L. T. Nieman, K. Sokolov, **M. K. Markey**, “Adaptive spectral window sizes for feature extraction from optical spectra”, Photonics West: Biomedical Optics, Proceedings of the SPIE 6864: 68640I (2008).

[024] R. Jahanbin, M. P. Sampat, G. S. Muralidhar, G. J. Whitman, A. C. Bovik, **M. K. Markey**, “Automated region of interest detection of spiculated masses in digital mammograms”, IEEE Southwest Symposium on Image Analysis and Interpretation (2008).

[025] S. Liu, A. S. Paranjape, B. Elmaanaoui, J. Dewelle, H. G. Rylander III, **M. K. Markey**, T E. Milner, “Quality assessment for spectral domain optical coherence tomography (OCT) images”, Photonics West: Biomedical Optics, Proceedings of the SPIE 7171: 71710X (2009).

[026] S. Gupta, **M. K. Markey**, “A theoretical treatment of the sources of variability in the output of pattern classifiers”, Medical Imaging: Image Perception, Observer Performance, and Technology Assessment, Proceedings of the SPIE 7263: 72630Y (2009).

### ***C. Other Major Publications***

#### *Journal Editorials (Special Issues)*

[001] P. Tarczy-Hornoch, **M. K. Markey**, J. A. Smith, T. Hiruki, “Bio\*medical informatics and genomic medicine: research and training”, Journal of Biomedical Informatics 40:1-4 (2007).

#### *Expert Commentaries*

[001] M. Dabeer, M.C. Fingeret, F. Merchant, G.P. Reece, E.K. Beahm, and **M. K. Markey**, “A research agenda for appearance changes due to breast cancer treatment”, Breast Cancer: Basic and Clinical Research, 2:1-3 (2008).

[002] G. S. Muralidhar, T.M. Haygood, T.W. Stephens, G.J. Whitman, A.C. Bovik, and **M. K. Markey**, “Computer-aided detection of breast cancer – Have all bases been covered?”, Breast Cancer: Basic and Clinical Research, 2:5-9 (2008).

#### *Non-Refereed Articles (Technical Magazines)*

[001] S. Gupta, **M. K. Markey**, A. C. Bovik, “Advancing state-of-the-art 3D human facial recognition”, SPIE Newsroom (2007); DOI: 10.1117/2.1200705.0727.

[002] C. W. Kan, **M. K. Markey**, “Under the hood: mutual information”, Biomedical Computation Review, Summer 2007, pg 32.

### ***D. Books, Chapters of Books; Editor of Books***

[001] M. P. Sampat, **M. K. Markey**, A. C. Bovik, “Computer-aided detection and diagnosis in mammography”, in Handbook of Image and Video Processing (ed. Bovik), 2<sup>nd</sup> edition 2005, pgs. 1195-1217.

[002] Q. Wu, **M. K. Markey**, “Computer-aided diagnosis of breast cancer on MR imaging”, in Recent Advances In Breast Imaging, Mammography, and Computer-Aided Diagnosis of Breast Cancer (eds. Suri and Rangayyan), 2006, pages 739-762.

[003] J. Y. Lo, A. O. Bilaska-Wolak, **M. K. Markey**, G. D. Tourassi, J. A. Baker, and C. E. Floyd Jr., “Computer-aided diagnosis in breast imaging: where do we go after detection?”, in Recent Advances In Breast Imaging, Mammography, and Computer-Aided Diagnosis of Breast Cancer (eds. Suri and Rangayyan), 2006, pages 871-900.

[004] S. Gupta, **M. K. Markey**, A. C. Bovik, “Advances and challenges in 3D and 2D+3D human face recognition”, in Pattern Recognition Research Horizons (ed. Erwin A. Zoeller), 2007, pages 161-200.

[005] C. W. Kan, L. T. Nieman, K. Sokolov, **M. K. Markey**, “AI in clinical decision support: applications in optical spectroscopy for cancer detection an diagnosis”, in Advanced Computational Intelligence Paradigms in Healthcare (ed. M. Sordo, et al.), 2008, pages 27-48.

[006] S. Gupta, **M. K. Markey**, and A. C. Bovik, "Frequency domain representations for 3-D face recognition," in *The Encyclopedia of Multimedia*, Second Edition, B. Furht (Eds.), New York: Springer, pp. 252-254, 2009.

### **E. Reviews**

[001] H. Shin, **M. K. Markey**, "A machine learning perspective on the development of clinical decision support systems utilizing mass spectra of blood samples", *Journal of Biomedical Informatics* 39:227-248 (2006). (review article)

[002] M. S. Kim, J. Sbalchiero, G. P. Reece, M. J. Miller, E. K. Beahm, **M. K. Markey**, "Assessment of breast aesthetics", *Plastic and Reconstructive Surgery* 121(4):186e-194e (2008). (review article)

### **ORAL PRESENTATIONS:**

[001] **M. K. Markey**, V. T. Tang, M. LaBarbera, "Swimming kinematics of *Argopecten irradians*", National Conference on Undergraduate Research, Western Michigan University, (1994).

[002] M. V. Boland, **M. K. Markey**, R. F. Murphy, "Automated classification of protein localization patterns", 36th American Society for Cell Biology Annual Meeting, *Molecular Biology of the Cell* 7: 908-908 Suppl. (1996).

[003] **M. K. Markey**, M. V. Boland, R. F. Murphy, "Towards objective selection of representative microscopy images", 37th American Society for Cell Biology Annual Meeting, *Molecular Biology of the Cell* 8: 2012-2012 Suppl. (1997).

[004] **M. K. Markey**, J. Y. Lo, C. E. Floyd, Jr., "Differences in computer aided diagnosis of breast cancer: masses vs. calcifications", World Congress on Medical Physics and Biomedical Engineering (2000).

[005] G. D. Tourassi, E. D. Frederick, **M. K. Markey**, C. E. Floyd, Jr., "Application of an information theoretic approach for feature selection in the computer-aided diagnosis of acute pulmonary embolism", Radiological Society of North America Annual Meeting, *Radiology* 221:547-547 Suppl. (2001).

[006] **M. K. Markey**, G. D. Tourassi, C. E. Floyd, Jr., "Classification of clinical specimens by CART model of proteins identified by mass spectroscopy", First Annual Proteomics Datamining Conference, Duke University (2002).

[007] **M. K. Markey**, J. Y. Lo, G. D. Tourassi, C. E. Floyd, Jr., "Self-organizing map for cluster analysis of a breast cancer database", Susan G. Komen Mission Conference (2003).

[008] **M. K. Markey**, S. Gupta, P. F. Chyn, "Agreement in BI-RADS reporting of lesions in CC and MLO views in the DDSM", Medical Image Perception Conference X (2003).

[009] M. S. Kim, G. P. Reece, E. N. Atkinson, **M. K. Markey**, "Objective assessment of the aesthetic outcomes of breast cancer treatment: measuring ptosis from clinical photographs", BECON/BISTIC 2004 Symposium on Biomedical Informatics for Clinical Decision Support: A Vision for the 21st Century (2004).

[010] H. Shin, J. Koomen, K. A. Baggerly, **M. K. Markey**, "Towards a noise model of MALDI TOF spectra", American Association for Cancer Research (AACR) Advances in Proteomics in Cancer Research (2004).

[011] S. Gupta, **M. K. Markey**, "Correspondence In texture features between two mammographic views", Biomedical Engineering Society (BMES) Annual Fall Meeting (2004).

[12] E. A. Fischer, M. Payne, **M. K. Markey**, "Bayesian networks for inferring regulation of *Plasmodium falciparum*'s biosynthetic processes", Critical Assessment of Microarray Data (CAMDA) (2004).

[013] M. P. Sampat, G. J. Whitman, L. D. Broemeling, A. C. Bovik, **M. K. Markey**, "Inter- and intra-observer variability in measuring properties of spiculated lesion on mammography", Medical Imaging Perception Conference XI (2005).

- [014] M. S. Kim, W. N. Rodney, J. Peng, G. P. Reece, **M. K. Markey**, "Towards quantifying the aesthetic outcomes of breast cancer treatment: assessing surgical scars", American Medical Informatics Association Annual Symposium (2005).
- [015] H. Shin, B. Sheu, **M. K. Markey**, "Guilt-by-association feature selection applied to simulated proteomic data", American Medical Informatics Association Annual Symposium (2005).
- [016] S. Y. Park, **M. K. Markey**, C. MacAulay, A. Milbourne, A. Malpica, J. Benedet, M. Follen, R. Richards-Kortum, "Multispectral Digital Colposcope for the Detection of Cervical Intraepithelial Neoplasia", 4th Int'l Cervical Cancer Conference, Houston, TX (2005).
- [017] H. Shin, M. Mutlu, J. M. Koomen, **M. K. Markey**, "Analysis of noise in MALDI-TOF mass spectrometry", UK-Texas Bioscience Collaboration workshop on The Molecular Signature of Cancer (2006).
- [018] M. P. Sampat, G. J. Whitman, **M. K. Markey**, A. C. Bovik, "Comparison of algorithms to enhance spicules on spiculated lesions", Society for Computer Applications in Radiology Annual Meeting (2006).
- [019] N. D. Harrison, L. T. Nieman, C. W. Kan, A. K. El-Naggar, **M. K. Markey**, A. Gillenwater, K. Sokolov, "Analysis of polarization spectroscopy data to improve imaging of epithelial pre-cancers", Gordon Research Conference, Lasers in Medicine & Biology, 2-7 July, Plymouth, NH (2006).
- [020] E. A. Fischer, K. L. Drake, **M. K. Markey**, "Identifying activation of transcription factor modules in microarray experiments", Biomedical Engineering Society 2006 Annual Meeting (2006).
- [021] E. A. Fischer, M. Friedman, **M. K. Markey**, "Empirical comparison of tests for differential expression on simulated time series microarray experiments", American Medical Informatics Association 2006 Annual Symposium (2006).
- [022] H. Shin, M. P. Sampat, S. F. Bish, J. M. Koomen, **M. K. Markey**, "Statistical characterization of chemical noise in MALDI TOF MS by wavelet analysis of multiple noise realizations", American Medical Informatics Association 2006 Annual Symposium (2006).
- [023] R. G. Aranibar, S. Byers, **M. K. Markey**, H. G. Rylander III, T. E. Milner, "Relationship between birefringence and neurotubule density of the primate retinal nerve fiber layer", SPIE Photonics West: BIOS Biomedical Optics (2007).
- [024] Q. Wu, G. J. Whitman, D. S. Fussell, **M. K. Markey**, "Lesion segmentation on Dynamic Contrast-Enhanced Breast MRI using mean shift method", 24th Annual Houston Conference on Biomedical Engineering Research (2007).
- [025] M. P. Sampat, G. J. Whitman, S. Gupta, D. R. Hurtubise, A. C. Bovik, **M. K. Markey**, "Reliability of measuring properties of spiculated lesions using a stylus vs. mouse interface", 24th Annual Houston Conference on Biomedical Engineering Research (2007).
- [026] H. Shin, **M. K. Markey**, "Wavelet-based denoising for MALDI TOF mass spectra by interval and level dependent thresholding", 24th Annual Houston Conference on Biomedical Engineering Research (2007).
- [027] S. Gupta, W. Han, D. R. Hurtubise, M. S. Kim, E. K. Beahm, G. P. Reece, F. A. Merchant, **M. K. Markey**, "Assessment of breast reconstruction surgery outcomes using 3D human body scans", Biomedical Engineering Society (BMES) Annual Fall Meeting (2007).
- [028] M. S. Kim, A. Burgess, G. P. Reece, E. K. Beahm, A. J. Waters, K. M. Basen-Engquist, G. Baum, H. Lee, M. K. Markey, "Understanding surgeons' assessments of the aesthetic outcome of breast cancer treatment using eye-tracking", Medical Image Perception Conference XII (2007).
- [029] C. W. Kan, B. Jiang, L. T. Nieman, K. Sokolov, **M. K. Markey**, "Comparison of linear and non-linear classifiers for oral cancer screening by optical spectroscopy", American Medical Informatics Association 2007 Annual Symposium (2007).
- [030] M. S. Kim, W. N. Rodney, G. P. Reece, T. Cooper, **M. K. Markey**, "Quantifying the Aesthetic Outcomes of Breast Cancer Treatment: Assessment of Artificial Scars", American

Medical Informatics Association 2007 Annual Symposium (2007).

[031] H. Shin, C. W. Kan, H. J. Hocker, **M. K. Markey**, “Effect of normalization methods on biomarker identification utilizing mass spectrometry”, American Medical Informatics Association 2007 Annual Symposium (2007).

[032] R. Jahanbin, G. Muralidhar, M. P. Sampat, T. Haygood, T. Stephens, G. J. Whitman, A. C. Bovik, **M. K. Markey**, “Characterization of True and False Positive Locations of Spiculated Lesions On Mammography”, American Association of Physicists in Medicine Annual Meeting (2008).

[033] M. Dabeer, M. Kyrish, M. S. Kim, P. Reyes, N. Udpa, G. P. Reece, **M. K. Markey**, “Toward decision support for breast reconstruction: automated calculation of symmetry measure on clinical photographs”, American Medical Informatics Association 2008 Annual Symposium (2008).

[034] G. S. Muralidhar, S. Channappayya, J. H. Slater, E. M. Blinka, A. C. Bovik, W. Frey, **M. K. Markey**, “Comparison of pre-processing techniques for fluorescence microscopy images of cells labeled for action”, American Medical Informatics Association 2008 Annual Symposium (2008).

#### PATENTS:

Model-based Framework for the Detection of Spiculated Masses on Mammography  
Project ID: 1646-AL (US Patent Pending)

#### GRANTS AND CONTRACTS:

##### COMPLETED:

Role	Title	Agency	Total Costs, All Years	Grant Period
PI	Evidence-based computer-aided detection of breast cancer	Wallace H. Coulter Foundation	\$240,000	08/01/06-12/31/08
Consultant (PI: Merchant)	3D breast anatomy analysis in cancer treatment planning and outcome assessment	NIH/NCI	N/A (consultant)	09/01/07-08/31/08
PI	Objective assessment of breast reconstruction aesthetics	NIH/NCI	\$328,186	04/01/05-03/31/08
PI	Computer-aided diagnosis of breast cancer on dynamic contrast-enhanced MRI	UT Center for BME (seed grant)	\$28,570	01/01/06-12/31/06
PI	Objective assessment of breast reconstruction aesthetics	Vice President for Research, UT Austin	\$5,240	12/09/03-08/31/04
PI	Computer decision aid for the diagnosis of pancreatic cancer using mass spectrometry	UT Center for BME (seed grant)	\$20,000	09/01/03-08/31/03

##### ACTIVE:

Role	Title	Agency	Total Costs, All Years	Grant Period
Co-investigator (PI: Rylander)	Quantitative RNFL assessment for glaucoma diagnosis	NIH/NEI	\$85,000 (Markey share)	02/01/06-01/31/11
PI	Quantifying appearance changes following breast reconstruction	American Cancer Society	\$685,897	07/01/09-06/30/13
Co-PI (w/ Rylander)	Comprehensive Training Program in Imaging Science and Informatics	NIH/NIBIB	\$732,655	08/01/09-07/31/14

**PH.D. SUPERVISIONS COMPLETED:**

Name	Year	Program	Institution	Co-supervisor (Markey Contribution)	Placement
Mehul P. Sampat	2006	Biomedical Engineering	UT Austin	Alan C. Bovik (50%)	(1) Postdoc, Brigham and Women's Hospital, Harvard
Hyunjin Shin	2006	Electrical & Computer Engineering	UT Austin	Jonathan W. Valvano (99%)	(1) Postdoc, Dana-Farber Cancer Institute, Harvard
Sun Young Park	2007	Biomedical Engineering	UT BME	Rebecca Richards-Kortum (10%)	(1) Postdoc at UT Austin; (2) Science and Technology International (STI)
Min Soon Kim	2007	Biomedical Engineering	UT BME	N/A (100%)	(1) Postdoc, Mayo Clinic; (2) Postdoc, Mount Sinai School of Medicine
Shalini Gupta	2008	Electrical & Computer Engineering	UT Austin	Alan C. Bovik (50%)	(1) Texas Instruments

**M.S. SUPERVISIONS COMPLETED:**

Name	Year	Program	Institution	Co-supervisor (Markey Contribution)	Placement
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Shalini Gupta	2004 (thesis)	Electrical & Computer Engineering	UT Austin	Joydeep Ghosh (99%)	(1) Doctoral program, ECE, UT Austin; (2) Texas Instruments
Ernest Fischer	2006 (thesis)	Biomedical Engineering	UT Austin	N/A (100%)	(1) Medical school, UT Southwestern Medical Center
Sanket Borgaonkar	2008 (thesis)	Biomedical Engineering	UT BME	N/A (100%)	(1) Volcano Corporation
Mugdha Dabeer	2008 (thesis)	Biomedical Engineering	UT BME	N/A (100%)	(1) Dell

**PH.D. IN PROGRESS:**

## A. Students admitted to candidacy

Name	Expected Completion	Program	Institution	Co-supervisor (Markey Contribution)
Chih-Wen Kan	Spring 2010	Biomedical Engineering	UT BME	Konstantin V. Sokolov (50%)

## B. Post M.S. students preparing to take Ph.D. candidacy exam

Name	Expected Candidacy	Program	Institution	Co-supervisor (Markey Contribution)
Gautam Muralidhar	Fall 2009	Biomedical Engineering	UT BME	Alan C. Bovik (50%)
Shuang Li	Fall 2010	Biomedical Engineering	UT BME	H. Grady Rylander (50%)
Juhun Lee	Fall 2011	Electrical and Computer Engineering	UT Austin	Alan C. Bovik (50%)

**M.S. IN PROGRESS:**

N/A

**VITA:**

Dr. Mia K. Markey is a 1994 graduate of the Illinois Mathematics and Science Academy. She earned her B.S. in computational biology (1998) from Carnegie Mellon University and her Ph.D. in biomedical engineering (2002), along with a certificate in bioinformatics, from Duke University. Dr. Markey's lab designs cost-effective, computer-based decision aids. The BMIL develops decision support systems for clinical decision making and scientific discovery using artificial intelligence and signal processing technologies. The BMIL's research portfolio also

includes projects in biometrics. Dr. Markey has been recognized for excellence in research and teaching with awards from organizations such as the American Medical Informatics Association and the American Society for Engineering Education.

## ENGINEERING EDUCATION RESEARCH:

### **Memberships:**

American Society for Engineering Education

### **Other Professional Service Activities:**

#### *Manuscript Reviews*

Abstracts and papers for *American Association for Engineering Education* annual conferences

#### *Proposal/Fellowship Reviews*

- Science, Mathematics, and Research for Transformation Defense Scholarship for Service Program (SMART), March 2007 & January 2008
- Ford Foundation Diversity Fellowship, March 2009

#### *Panels, Session Chairing, etc*

- Moderated session on “Engineering Education and Research” at ASEE Gulf-Southwest Section conference 2006
- Moderated session on “Faculty Development: Tenure & Promotion” at ASEE Annual Conference and Exposition 2006
- Panelist, “New Faculty Forum”, American Institute of Chemical Engineers 2006 Annual Meeting
- Moderated session on “BME Laboratories and Skills-based Projects” at ASEE Annual Conference and Exposition 2008
- Co-Moderated session on “Tricks of the Trade II” at ASEE Annual Conference and Exposition 2009

### **Publications:**

#### *A. Refereed Archival Journal Publications*

[1] **M. K. Markey**, A. Holmes, T. F. Edgar, K. J. Schmidt, “Student-driven learning in integrated lecture-lab classroom environments: the role of mobile computing”, *International Journal of Engineering Education* 23:483-490 (July 2007).

#### *B. Refereed Conference Proceedings*

[1] **M. K. Markey**, K. J. Schmidt, M. G. Saldivar, “Developing an instructional technology scaffold for reinforcing learning of probability and statistics”, *Proceedings of the 2005 American Society for Engineering Education Annual Conference and Exposition*. (Highlighted in the summary of UT COE Faculty Innovation Center activities in the *National Academy of Engineering CASEE Chronicles Volume 2*).

[2] **M. K. Markey**, K. J. Schmidt, “Assessing an instructional technology scaffold for reinforcing learning of probability and statistics”, *Proceedings of the 2006 American Society for Engineering Education Annual Conference and Exposition*.

[3] K. J. Schmidt, **M. K. Markey**, T. E. Milner, “Distance learning in support of an inter-institutional BME department”, *Proceedings of the 2007 American Society for Engineering Education Annual Conference and Exposition*.

[4] K. J. Schmidt, **M. K. Markey**, “Relationship between learning style preferences and instructional technology usage”, *Proceedings of the 2008 American Society for Engineering Education Annual Conference and Exposition (2008)*.

- [5] K. J. Schmidt, **M. K. Markey**, W. Park, “Beyond anecdotes: how to assess what goes on in your classes”, Proceedings of the 2009 American Society for Engineering Education Annual Conference and Exposition (2009). (3<sup>rd</sup> place best paper, New Engineering Educators Division)
- [6] **M. K. Markey**, K. J. Schmidt, W. Park, “A tale of two cities: distance-learning technologies in an inter-institutional BME department”, Proceedings of the 2009 American Society for Engineering Education Annual Conference and Exposition (2009).

*Oral Presentations:*

- [1] **M. K. Markey**, K. J. Schmidt, S. Hays, “Non-linear PowerPoint as an aid in learning probability, random processes, and statistics” (ASEE GSW 2006 Conference).
- [2] K. J. Schmidt, **M. K. Markey**, C. C. Seepersad, “Preparing new engineering faculty for the classroom: a dialogue on faculty development efforts” (ASEE Annual Conference and Exposition 2006).
- [3] **M. K. Markey**, K. J. Schmidt, “Do instructional technologies provide the same benefits for students with different learning styles?” (ASEE GSW 2007 Conference).
- [4] K. J. Schmidt, **M. K. Markey**, T. E. Milner, “Distance learning in support of an inter-institutional BME department” (Texas Distance Learning Association 2007 Annual Conference).
- [5] M. Zaman, **M. K. Markey**, K. J. Schmidt, “Developing a numerical methods course with a substantial computer-programming component based on cutting-edge research problems: Success and Challenges” (ASEE GSW 2008 Conference).
- [6] **M. K. Markey**, K. J. Schmidt, W. Park, “Instructional technology in engineering: do men and women derive the same benefits?” (ASEE GSW 2009 Conference).
- [7] L. E. Katz, **M. K. Markey**, K. J. Schmidt, S. E. Woods, T. S. Berry, “The impact of funding on female faculty advancement” (WEPAN National Conference 2009).

*Support:*

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|-----------|--|
| 2008      | Austin “~FAST Tex” award developing “Development of a question pool to support student learning of probability”. Student developer: Wonsoon Park.  |
| 2007      | UT Austin “~FAST Tex” award with K. J. Schmidt for developing “MATLAB examples to enhance learning of statistics by biomedical engineering”. Student developers: Patrick Cheng, Sam Yang.                      |
| 2007      | UT Austin “~FAST Tex” award with M. H. Zaman for “Development of modules to teach programming principles in BME”. Student developer: Kyle Chai.  |
| 2006-2007 | UT Austin “Academic Development Grant” with M. H. Zaman for “Development of Computational Labs on Numerical Methods in Biomedical Engineering”. Teaching Assistant: Shalini Gupta. \$10,142.00.                |
| 2006      | UT Austin “~FAST Tex” award with K. J. Schmidt for developing “Non-Linear PowerPoint Presentations with Links to MATLAB Examples”. Student developers: James Byrne & Steven Ma.                                |
| 2005      | UT Austin “~FAST Tex” award with K. J. Schmidt for developing “Non-Linear PowerPoint to Aid Learning of Probability, Random Processes, and Statistics”. Student developer: Seth Hays.                          |
| 2004-2005 | UT Austin “Academic Development Grant” with K. J. Schmidt for “Development of Computational Labs for Engineering Probability, Random Processes, and Statistics”. Teaching Assistant: Hyunjin Shin. \$9,574.00. |