

CURRICULUM VITAE

for
Permanent Record
and the
Appointments and Promotions Committee

Joseph Yuan-Chieh Lo, Ph.D.

- PRIMARY ACADEMIC APPOINTMENT:** Radiology
Duke University Medical Ctr.
- SECONDARY ACADEMIC APPOINTMENT:** Biomedical Engineering
Duke University
Medical Physics
Duke University
- PRESENT ACADEMIC RANK AND TITLE:** Associate Professor
- EDUCATION:** Duke University, Durham, NC.
B.S.E. in Biomedical Engineering, 1988
Ph.D. in Biomedical Engineering, 1993
- HONORS:** Graduate Fellowship, Duke University
Magna cum laude, Duke University
Phi Beta Kappa
Tau Beta Pi
- SCHOLARLY SOCIETIES:**
AAPM – American Association of Physicists in Medicine
IEEE – Institute of Electrical and Electronics Engineers
SPIE – International Society for Optical Engineering

PROFESSIONAL TRAINING AND ACADEMIC CAREER:

1988-1993	Teaching and Research Assistant Biomedical Engineering, Duke University
1993-1995	Research Associate Radiology, Duke University Medical Center
1995-2009	Assistant Research Professor Radiology, Duke University Medical Center
1997-2009	Assistant Research Professor Biomedical Engineering, Duke University
1999-present	Director, Biomedical Imaging & Medical Physics Third Year Study Program Duke University Medical School
2004-present	Faculty Medical Physics Graduate Program, Duke University
2009-present	Associate Professor Radiology, Duke University Medical Center
2009-present	Associate Professor Biomedical Engineering, Duke University

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I. PUBLICATIONS:

Publication summary:

60	A. Refereed journal publications
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A. REFEREED JOURNALS:

Number of refereed publications: 60

Number as first or senior author: 24 (marked with *)

- 1 Chotas HG, Floyd CE, Jr, Dobbins JT, III, **Lo JY**, and Ravin CE, "Scatter fractions in AMBER imaging," *Radiology* 177, 879-880 (1990).
- 2 Floyd CE, Jr, **Lo JY**, Chotas HG, and Ravin CE, "Quantitative scatter measurement in digital radiography using a photostimulable phosphor imaging system," *Med Phys* 18, 408-413 (1991).
- 3 Floyd CE, Jr, Baker JA, **Lo JY**, and Ravin CE, "Measurement of scatter fractions in clinical bedside radiography," *Radiology* 183, 857-861 (1992).
- 4 Floyd CE, Jr, Baker JA, **Lo JY**, and Ravin CE, "Posterior Beam Stop method for scatter fraction measurement in digital radiography," *Invest Radiol* 27, 119-123 (1992).
- 5 Baker JA, Floyd CE, Jr, **Lo JY**, and Ravin CE, "Observer evaluation of scatter subtraction for digital portable chest radiographs," *Invest Radiol* 28, 667-670 (1993).
- 6 Floyd CE, Jr, Baydush AH, **Lo JY**, Bowsher JE, and Ravin CE, "Scatter compensation for digital chest radiography using Maximum Likelihood Expectation Maximization," *Invest Radiol* 28, 427-433 (1993).
- 7 Jordan LK, III, Floyd CE, Jr, **Lo JY**, and Ravin CE, "Measurement of scatter fractions in erect posteroanterior and lateral chest radiography," *Radiology* 188, 215-218 (1993).
- 8* **Lo JY**, Floyd CE, Jr, Baker JA, and Ravin CE, "An artificial neural network for estimating scatter exposures in portable chest radiography," *Med Phys* 20, 965-973 (1993).
- 9 Floyd CE, Jr, Baydush AH, **Lo JY**, Bowsher JE, and Ravin CE, "Bayesian restoration of chest radiographs: Scatter compensation with improved signal to noise ratio," *Invest Radiol* 29, 904-910 (1994).

- 10 Floyd CE, Jr, **Lo JY**, Yun AJ, Sullivan DC, and Kornguth PJ, "Prediction of breast cancer malignancy using an artificial neural network," *Cancer* 74, 2944-2948 (1994).
- 11* **Lo JY**, Floyd CE, Jr, Baker JA, and Ravin CE, "Scatter compensation in digital chest radiography using the Posterior Beam Stop technique," *Med Phys* 21, 435-443 (1994).
- 12 Baker JA, Kornguth PJ, **Lo JY**, Williford ME, and Floyd CE, Jr, "Breast cancer: prediction with artificial neural network based on BI-RADS standardized lexicon," *Radiology* 196, 817-822 (1995).
- 13* **Lo JY**, Baker JA, Kornguth PJ, and Floyd CE, Jr, "Computer-aided diagnosis of breast cancer: artificial neural network approach for optimized merging of mammographic features," *Acad Radiol* 2, 841-850 (1995).
- 14 Baker JA, Kornguth PJ, **Lo JY**, and Floyd CE, Jr, "Artificial neural network: improving the quality of breast biopsy recommendations," *Radiology* 198, 131-135 (1996).
- 15 Floyd CE, Jr, **Lo JY**, Tourassi GD, Baker JA, Vitittoe NF, and Vargas-Voracek R, "Computer aided diagnosis in thoracic and mammographic radiology," *Medical Imaging Technology* 14, 629-634 (1996).
- 16 Floyd CE, Jr, Patz EF, Jr, **Lo JY**, Vittitoe NF, and Stambaugh LE, "Diffuse nodular lung disease on chest radiographs: A pilot study of characterization by fractal dimension," *AJR* 167, 1185-7 (1996).
- 17* **Lo JY**, Baker JA, Kornguth PJ, Iglehart JD, and Floyd CE, Jr, "Predicting breast cancer invasion with artificial neural networks on the basis of mammographic features," *Radiology* 203, 159-163 (1997).
- 18 Freed KS, **Lo JY**, Baker JA, Floyd CE, Jr, Low VHS, Seabourn JT, and Nelson RC, "Predictive model for the diagnosis of intraabdominal abscess," *Acad Radiol*, 473-9 (1998).
- 19* **Lo JY**, Baker JA, Kornguth PJ, and Floyd CE, Jr, "Effect of patient history data on the prediction of breast cancer from mammographic findings with artificial neural networks," *Acad Radiol* 6, 10-15 (1999).
- 20 Munley MT, **Lo JY**, Sibley GS, Bentel GC, Anscher MS, and Marks LB, "A neural network to predict symptomatic lung injury," *Phys Med Biol* 44, 2241-2249 (1999).
- 21 Floyd CE, Jr, **Lo JY**, and Tourassi GD, "Cased-based reasoning computer algorithm that uses mammographic findings for breast biopsy decisions," *AJR* 175, 1347-1352 (2000).
- 22* Gavrielides MA, **Lo JY**, Vargas-Voracek R, and Floyd CE, Jr, "Segmentation of suspicious clustered microcalcifications in mammograms," *Med Phys* 27, 13-22 (2000). [Ph.D. co-advisor of first author Gavrielides.]

- 23* Akanda A, Land WH, and **Lo JY**, “Application of support vector machines to breast cancer classification using mammogram and history data,” Smart Engineering System Design: Neural Networks, Fuzzy Logic, Evolutionary Programming, Data Mining, and Complex Systems, edited by Dagli CH et al. (ASME Press, New York, NY, 2001) 11: 839-846.
- 24 Baydush AH, Catarious DM, Jr, **Lo JY**, Abbey CK, and Floyd CE, Jr, “Computerized classification of suspicious regions in chest radiographs using subregion Hotelling observers,” *Med Phys* 28, 2403-9 (2001).
- 25 Tourassi GD, Markey MK, **Lo JY**, and Floyd CE, Jr, “A Neural Network Approach to Breast Cancer Diagnosis as a Constraint Satisfaction Problem,” *Med Phys* 28, 804-811 (2001).
- 26* Gavrielides MA, **Lo JY**, and Floyd CE, Jr, “Parameter optimization of a computer-aided diagnosis scheme for the segmentation of microcalcification clusters in mammograms,” *Med Phys* 29, 475-483 (2002). [Ph.D. co-advisor of first author Gavrielides.]
- 27 Keogan MT, **Lo JY**, Freed KS, Raptopoulos V, Blake S, R KI, Weisinger K, Rosen MP, and Nelson RC, “Outcome analysis of patients with acute pancreatitis by using of an artificial neural network,” *Acad Radiol* 9, 410-419 (2002).
- 28* **Lo JY**, Markey MK, Baker JA, and Floyd CE, Jr, “Cross-institutional evaluation of BI-RADS predictive model for mammographic diagnosis of breast cancer,” *AJR* 178, 457-463 (2002).
- 29* Markey MK, **Lo JY**, and Floyd CE, Jr, “Differences between computer-aided diagnosis of breast masses and that of calcifications,” *Radiology* 223, 489-493 (2002). [Ph.D. advisor of first author Markey.]
- 30* Markey MK, **Lo JY**, Vargas-Voracek R, Tourassi GD, and Floyd CE, Jr, “Perceptron error surface analysis: A case study in breast cancer diagnosis,” *Computers in Biology & Medicine* 32, 99-109 (2002). [Ph.D. advisor of first author Markey.]
- 31 Baker JA, Rosen EL, **Lo JY**, Gimenez EI, Walsh R, and Soo MS, “Computer-aided detection (CAD) in screening mammography: sensitivity of commercial CAD systems for detecting architectural distortion,” *AJR* 181, 1083-8 (2003).
- 32* Bilska-Wolak AO, Floyd CE, Jr, Nolte LW, and **Lo JY**, “Application of likelihood ratio to classification of mammographic masses; performance comparison to case-based reasoning,” *Med Phys* 30, 949-958 (2003). [Ph.D. co-advisor of first author Bilska-Wolak.]
- 33* Markey MK, **Lo JY**, Tourassi GD, and Floyd CE, Jr, “Self-organizing map for cluster analysis of a breast cancer database,” *Artificial Intelligence in Medicine* 27, 113-127 (2003). [Ph.D. advisor of first author Markey.]

- 34 Baker JA, **Lo JY**, Delong DM, and Floyd CE, Jr, "Computer-aided detection in screening mammography: Variability in cues," *Radiology* 233, 411-417 (2004).
- 35 Samei E, **Lo JY**, Yoshizumi TT, Jesneck JL, Dobbins JT, III, Floyd CE, Jr, McAdams HP, and Ravin CE, "Comparative scatter and dose performance of slot-scan and wide-beam digital chest radiographic systems," *Radiology* 235, 940-949 (2005).
- 36 Samei E, Saunders RS, **Lo JY**, Dobbins JT, III, Jesneck JL, Floyd CE, Jr, and Ravin CE, "Fundamental imaging characteristics of a slot-scan digital chest radiographic system," *Med Phys* 31, 2687-2698 (2004).
- 37* Saunders RS, Samei E, Jesneck JL, and **Lo JY**, "Physical characterization of a prototype selenium-based full-field digital mammography detector," *Med Phys* 32, 588-599 (2005). [PI of Siemens grant funding this study.]
- 38 Bilska-Wolak AO, Floyd CE, Jr., **Lo JY**, and Baker JA, "Computer aid for decision to biopsy breast masses on mammography: validation on new cases," *Acad Radiol* 12, 671-80 (2005).
- 39 Baker JA, Rosen EL, Crockett MM, and **Lo JY**, "Accuracy of Segmentation of a Commercial Computer-aided Detection System for Mammography," *Radiology* 235(2):385-90 (2005).
- 40 Samei E, Dobbins JT, III, **Lo JY**, and Tornai MP, "A framework for optimising the radiographic technique in digital x-ray imaging," *Radiation Protection Dosimetry* 114, 220-229 (2005)(invited paper).
- 41* Jesneck JL, Nolte LW, Baker JA, Floyd CE, Jr, **Lo JY**. "Optimized approach to decision fusion of heterogeneous data for breast cancer diagnosis," *Med Phys* 33:2945-2954 (2006). [Ph.D. advisor of first author Jesneck.]
- 42 Floyd CE, Jr, Bender JE, Sharma AC, Kapadia A, Xia J, Harrawood B, Tourassi GD, **Lo JY**, Crowell A, Howell C. "Introduction to neutron stimulated emission computed tomography," *Phys Med Biol* 51:3375-3390 (2006).
- 43* Jesneck JL, **Lo JY**, Baker JA. "Breast mass lesions: Computer-aided diagnosis models with mammographic and sonographic descriptors," *Radiology* 244(2):390-8 (2007). [Ph.D. advisor of first author Jesneck.]
- 44 Baydush AH, Catarious DM, **Lo JY**, Floyd CE, Jr, "Incorporation of a Laguerre-Gauss channelized Hotelling observer for false-positive reduction in a mammographic mass CAD system," *J Digit Imaging* 20(2):196-20 (2007).
- 45 Samei E, Stebbins SA, Dobbins JT, III, McAdams HP, **Lo JY**, "Multiprojection correlation imaging for improved detection of pulmonary nodules," *AJR Am J Roentgenol* 188:1239-1245 (2007).

- 46* Chen Y, **Lo JY**, Dobbins JT, 3rd. "Importance of point-by-point back projection correction for isocentric motion in digital breast tomosynthesis: relevance to morphology of structures such as microcalcifications," *Med Phys* 34:3885-3892 (2007). [Ph.D. co-advisor of first author Chen.]
- 47 Tourassi GD, Harrawood B, Singh S, **Lo JY**, Floyd CE, Jr, "Evaluation of information-theoretic similarity measures for content-based retrieval and detection of masses in mammograms," *Med Phys* 34(1):140-50 (2007).
- 48 Tourassi GD, Harrawood B, Singh S, **Lo JY**. "Information-theoretic CAD system in mammography: entropy-based indexing for computational efficiency and robust performance," *Med Phys* 34:3193-3204 (2007).
- 49 Floyd CE, Jr, Sharma AC, Bender JE, Kapadia AJ, Xia JQ, Harrawood BP, Tourassi GD, **Lo JY**, Kiser MR, Crowell AS, Pedroni RD, Marci RA, Tajima S, Howell CR. "Neutron Stimulated Emission Computed Tomography: Background Corrections," *Nuc. Inst. And Meth. B* 254(2) 329-336 (2007).
- 50 Chawla AS, Samei E, Saunders RS, **Lo JY**, Baker JA. "A mathematical model platform for optimizing a multiprojection breast imaging system," *Med Phys* 35:1337-1345 (2008).
- 51* Karellas A, **Lo JY**, Orton CG. "Point/Counterpoint: Cone beam x-ray CT will be superior to digital x-ray tomosynthesis in imaging the breast and delineating cancer," *Med Phys* 35:409-411 (2008). [Invited paper, co-first author.]
- 52* Xia JQ, **Lo JY**, Yang K, Floyd C, Jr, Boone JM. "Dedicated breast computed tomography: Volume image denoising via a partial-diffusion equation based technique," *Med Phys* 35:2110-123 (2008). [Ph.D. advisor of first author Xia.]
- 53 Williams MB, Raghunathan P, More MJ, Seibert JA, Kwan A, **Lo JY**, Samei E, Ranger NT, Fajardo LL, McGruder A, McGruder SM, Maidment ADA, Yaffe MJ, Bloomquist A, Mawdsley G. "Optimization of exposure parameters in full field digital mammography," *Med Phys* 35: 2414-2423 (2008).
- 54* Singh S, Tourassi GD, Baker JA, Samei E, **Lo JY**. "Automated breast mass detection in 3D reconstructed tomosynthesis volumes: A featureless approach," *Med Phys* 35: 3626-36 (2008) [Ph.D. advisor of first author Singh.]
- 55 Floyd CE, Jr, Kapadia AJ, Bender JE, Sharma AC, Xia JQ, Harrawood BP, Tourassi GD, **Lo JY**, Crowell AS, Kiser MR, Howell RH. "Neutron-stimulated emission computed tomography of a multi-element phantom," *Phys Med Biol* 53:2313-25 (2008).
- 56* Chen Y, **Lo JY**, Dobbins JT III. "Impulse response and modulation transfer function analysis for shift-and-add and back projection image reconstruction algorithms in digital breast tomosynthesis (DBT)," *Int. J. Functional Informatics and Personalised Medicine*, 1(2): 189-204 (2008). [Ph.D. co-advisor of first author Chen.]

- 57* Singh S, Maxwell J, Baker JA, Nicholas JN, **Lo JY**. "Computer-aided Classification of Breast Masses: Performance and Interobserver Variability of Expert and Non-expert Radiologists," *Radiology* (accepted). [Ph.D. advisor of first author Singh.]
- 58 Chawla AS, Saunders RS, Singh S, **Lo JY**, Samei E. "Towards optimized acquisition scheme for multiprojection correlation imaging of breast cancer," *Acad Radiol* 16, 456-463 (2009).
- 59* Jesneck JL, Mukherjee S, Yurkovetsky Z, Clyde M, Marks JR, Lokshin AE, **Lo JY**. "Do serum biomarkers really measure breast cancer?" *BMC Cancer* 9: 164 (2009).
- 60 Saunders RS, Jr., Samei E, **Lo JY**, Baker JA. "Can compression be reduced for breast tomosynthesis? Monte carlo study on mass and microcalcification conspicuity in tomosynthesis," *Radiology* 251 (3): 673-82 (2009).

Additional papers submitted or in revision, *not included in total count*:

- 1* Jesneck JL, Nolte LW, Tourassi GD, **Lo JY**. "A Bayesian method to estimate the minimum sample size for decision fusion," *Medical Decision Making* (submitted)

**B. NON-REFEREED PUBLICATIONS /
FULL-LENGTH CONFERENCE PROCEEDINGS:**

1. Floyd CE, Jr, Bowsher JE, Munley MT, Tourassi GD, Garg S, Baydush AH, **Lo JY**, and Coleman RE, "Artificial neural networks for SPECT image reconstruction with optimized weighted backprojection," 1991 IEEE Nuclear Science Symposium and Medical Imaging Conference, Sante Fe, NM, 3: 2184-2188 (1991).
2. **Lo JY**, Baydush AH, and Floyd CE, Jr, "Spatially varying scatter compensation for chest radiographs using a hybrid Madaline artificial neural network," Medical Imaging 1994: Image Processing, Loew MH, Ed., Proc. SPIE 2167, 601 (1994).
3. **Lo JY**, Baker JA, Kornguth PJ, and Floyd CE, Jr, "Computer-aided diagnosis of mammography: Artificial neural networks for optimized merging of standardized BIRADS features," Brown DG et al., Ed., World Congress on Neural Networks 95 (International Neural Network Society Annual Meeting), Washington, D.C., 2: 885-888 (1995).
4. **Lo JY**, Grisson AT, Floyd CE, Jr, and Kornguth PJ, "Computer-aided diagnosis of mammograms using an artificial neural network: merging of standardized input features from the ACR lexicon," Medical Imaging 1995: Image Processing, Loew MH, Ed., Proc. SPIE 2434, 571 (1995).

5. Mun SK, Freedman MT, Wu CY, Lo SCB, Floyd CE, Jr, **Lo JY**, Chan HP, Helvie MA, Petrick N, Sahiner B, Wei D, Chakraborty DP, Clarke LP, Kallergi M, Clark B, and Kim Y, "Academic consortium for the evaluation of computer-aided diagnosis (CADx) in mammography," *Medical Imaging 1995: Image Display*, Kim Y, Ed., Proc. SPIE 2431, 442 (1995).
6. Freed K, Baker JA, Floyd CE, Jr, Low VHS, Seabourn JT, **Lo JY**, and Nelson RC, "Use of an artificial neural network for the diagnosis of intraabdominal abscess," *American Roentgen Ray Society*, San Diego, CA (1996).
7. **Lo JY**, and Floyd CE, Jr, "Analysis of error surfaces of neural network applied to computer-aided diagnosis in mammography," *World Congress on Neural Networks '96 (International Neural Network Society 1996 Annual Meeting)*, Lawrence Erlbaum Associates, Inc., San Diego, CA, 1240 (1996).
8. **Lo JY**, Kim J, Baker JA, and Floyd CE, Jr, "Computer-aided diagnosis of mammography using an artificial neural network: Predicting the invasiveness of breast cancers from image features," *Medical Imaging 1996: Image Processing*, Loew MH, Ed., Proc. SPIE 2710, 725 (1996).
9. **Lo JY**, and Floyd CE, Jr, "Self-organizing maps for analyzing mammographic findings," *4*, Karayiannis NB, Ed., *IEEE International Conference on Neural Networks*, IEEE, Houston, TX, 4: 2472-4 (1997).
10. **Lo JY**, Land WH, and Morrison CT, "Application of evolutionary programming and probabilistic neural networks to breast cancer diagnosis," *1999 International Joint Conference on Neural Networks*, IEEE, Washington, DC, 5: 3712-6 (1999).
11. Tourassi GD, Floyd CE, Jr, and **Lo JY**, "A constraint satisfaction neural network for medical diagnosis," *1999 International Joint Conference on Neural Networks*, IEEE, Washington, DC, Manuscript #0261 Session #10.5A: 1-4 (1999).
12. Floyd CE, Jr, **Lo JY**, Tourassi GD, "Case-based reasoning as a computer aid to diagnosis," *Medical Imaging 1999: Image Processing*, Hanson KM, Ed., Proc. SPIE 3661, 486 (1999)
13. Land WH, Masters T, and **Lo JY**, "Application of a new evolutionary programming / adaptive boosting hybrid to breast cancer diagnosis," *Evolutionary Computation 2000*, Proceedings of IEEE Congress on Evolutionary Computation, 2: 1436-1442 (2000).
14. Land WH, Masters T, **Lo JY**, and McKee DW, "Using evolutionary computation to develop neural network breast cancer benign/malignant classification models," *4th World Conference on Systemics, Cybernetics, and Informatics*, 10: 343-7 (2000).

15. Land WH, Masters T, and **Lo JY**, “Application of a GRNN oracle to the intelligent combination of several breast cancer benign/malignant predictive paradigms,” Medical Imaging 2000: Image Processing, Hanson KM, Ed., Proc. SPIE 3979, 77 (2000).
16. **Lo JY**, Land WH, and Morrison CT, “Evolutionary programming technique for reducing complexity of artificial neural networks for breast cancer diagnosis,” Medical Imaging 2000: Image Processing, Hanson KM, Ed., Proc. SPIE 3979, 153 (2000).
17. Tourassi GD, Floyd CE, Jr, and **Lo JY**, “Use of constraint satisfaction neural network for breast cancer diagnosis and dynamic scenarios simulation,” Medical Imaging 2000: Image Processing, Hanson KM, Ed., Proc. SPIE 3979, 46 (2000).
18. Land WH, Masters T, **Lo JY**, and McKee DW, “Application of adaptive boosting to EP-derived multi-layer feedforward neural networks (MLFN) to improve benign/malignant breast cancer classification,” Medical Imaging 2001: Image Processing, Sonka M, Hanson KM, Eds., Proc. SPIE 4322, 1717 (2001).
19. Land WH, Masters T, **Lo JY**, and McKee DW, “Application of Evolutionary Computation and Neural Network Hybrids for Breast Cancer Classification Using Mammogram and History Data,” Evolutionary Computation 2001, Proceedings of IEEE World Congress of Evolutionary Computation, 2: 1147-1154 (2001).
20. Land WH, Masters T, **Lo JY**, McKee DW, and Anderson FR, “New Results in Breast Cancer Classification Obtained from an Evolutionary Computation/Adaptive Boosting Hybrid Using Mammogram and History Data,” Soft Computing in Industrial Applications, 2001. SMCia/01. Proceedings of the 2001 IEEE Mountain Workshop on Soft Computing in Industrial Applications, Virginia Tech, Blacksburg, Virginia (2001).
21. Land WH, Jr, Akanda A, **Lo JY**, Anderson F, and Bryden M, “Application of support vector machine machines to breast a cancer screening using mammogram and history data,” Medical Imaging 2002: Image Processing, Sonka M, Fitzpatrick JM, Eds., Proc. SPIE 4684, 636 (2002).
22. Markey MK, **Lo JY**, Tourassi GD, and Floyd CE, Jr, “Cluster analysis of BI-RADS descriptions of biopsy-proven breast lesions,” Medical Imaging 2002: Image Processing, Sonka M, Fitzpatrick JM, Eds., Proc. SPIE 4684, 363 (2002).
23. **Lo JY**, Gavrielides MA, Markey MK, and Jesneck JL, “Computer-aided classification of breast microcalcification clusters: Merging of features from image processing and radiologists,” Medical Imaging 2003: Image Processing, Sonka M, Fitzpatrick JM, Eds., Proc. SPIE 5032, 882 (2003).
24. Land WH, Jr, McKee D, Velazquez R, Wong L, **Lo JY**, and Anderson F, “Application of support vector machine machines to breast cancer screening using mammogram and clinical history data,” Medical Imaging 2003: Image Processing, Sonka M, Fitzpatrick JM, Eds., Proc. SPIE 5032, 546 (2003).

25. Bilaska-Wolak AO, Floyd CE, Jr, and **Lo JY**. "Prediction of breast biopsy outcome using a likelihood ratio classifier and biopsy cases from two medical centers," Medical Imaging 2003: Image Processing, Sonka M, Fitzpatrick JM, Eds., Proc. SPIE 5032, 1386 (2003)
26. Tourassi GD, **Lo JY**, and Markey MK, "Validation of a constraint satisfaction neural network for breast cancer diagnosis: New results from 1,030 cases," Medical Imaging 2003: Image Processing, Sonka M, Fitzpatrick JM, Eds., Proc. SPIE 5032, 207 (2003).
27. Land WH, Jr, McKee D, Anderson F, and **Lo JY**, "New results in computer aided diagnosis (CAD) of breast cancer using a recently developed SVM/GRNN Oracle hybrid," Medical Imaging 2004: Image Processing, Fitzpatrick JM, Sonka M, Eds., Proc. SPIE 5370, 777 (2004).
28. Land WH, Jr, McKee D, Anderson F, and **Lo JY**, "Breast cancer classification improvements using a new kernel function with evolutionary-programming-configured Support Vector Machines," Medical Imaging 2004: Image Processing, Fitzpatrick JM, Sonka M, Eds., Proc. SPIE 5370, 880 (2004).
29. Fischer EA, **Lo JY**, Markey MK, "Bayesian networks of BI-RADS™ descriptors for breast lesion classification," Conf Proc IEEE Eng Med Biol Soc, 4:3031-4 (2004).
30. Markey MK, and **Lo JY**, "Issues in assessing multi-institutional performance of BI-RADS-based CAD systems," Medical Imaging 2005: Image Processing, Fitzpatrick JM, Reinhardt JM, Eds., Proc. SPIE 5747, 858 (2005).
31. **Lo JY**, Samei E, Jesneck JL, Dobbins JT, III, Baker JA, Singh S, Saunders RS, and Floyd CE, Jr, "Radiographic technique optimization for an amorphous selenium FFDM system: Phantom measurements and initial patient results," Proceedings of the 7th International Workshop on Digital Mammography in 2004, edited by E. D. Pisano. (Biomedical Research Imaging Center at the University of North Carolina at Chapel Hill, Chapel Hill, NC, 2005) 31-36.
32. Jesneck JL, Saunders RS, Samei E, Xia Q, and **Lo JY**, "Detector evaluation of an amorphous selenium-based full field digital mammography system," Medical Imaging 2005: Physics of Medical Imaging, Flynn MJ, Ed., Proc. SPIE 5745, 478 (2005).
33. Chen Y, **Lo JY**, and Dobbins JT, 3rd, "Impulse response analysis for several digital tomosynthesis mammography reconstruction algorithms," Medical Imaging 2005: Image Processing, Flynn MJ, Ed., Proc. SPIE 5745, 541 (2005).
34. Bissonnette M, Hansroul M, Masson E, Savard S, Cadieux S, Warmoes P, Gravel D, Agopyan J, Polischuk B, Haerer W, Mertelmeier T, **Lo JY**, Chen Y, Dobbins JT, 3rd, Jesneck JL, and Singh S, "Digital breast tomosynthesis using an amorphous selenium flat panel detector," Medical Imaging 2005: Image Processing, Flynn MJ, Ed., Proc. SPIE 5745, 529 (2005).

35. Xia JQ, **Lo JY**, and Floyd CE, Jr., "Characterization of scatter radiation of a breast phantom on Siemens prototype FFDM with and without an anti-scatter grid," Medical Imaging 2005: Image Processing, Flynn MJ, Ed., Proc. SPIE 5745, 1096 (2005).
36. Jesneck JL, Nolte LW, Baker JA, and **Lo JY**, "The effect of data set size on computer-aided diagnosis of breast cancer: comparing decision fusion to a linear discriminant," Medical Imaging 2006: Image Perception, Observer Performance, and Technology Assessment, Jiang Y, Eckstein MP, eds., Proc. SPIE 6146, 614616 (2006).
37. Sharma AC, Floyd CE, Jr, Harrawood B, Tourassi GD, Kapadia A, Bender JE, **Lo JY**, and Howell C, "Rotating slit collimator design for high-energy near-field imaging," Medical Imaging 2006: Physics of Medical Imaging, Flynn MJ, Hsieh J, Ed., Proc. SPIE 6142, 614217 (2006).
38. Floyd CE, Jr, Bender JE, Harrawood B, Sharma AC, Kapadia A, Tourassi GD, **Lo JY**, and Howell C, "Breast cancer diagnosis using neutron stimulated emission computed tomography: dose and count requirements," Medical Imaging 2006: Physics of Medical Imaging, Flynn MJ, Hsieh J, Ed., Proc. SPIE 6142, 614210 (2006)
39. Singh S, Baydush AH, Harrawood B, and **Lo JY**, "Mass detection in mammographic ROIs using Watson filters," Medical Imaging 2006: Image Perception, Observer Performance, and Technology Assessment, Jiang Y, Eckstein MP, eds., Proc. SPIE 6146, 614603 (2006).
40. Chen Y, **Lo JY**, Ranger NT, Same E, and Dobbins JT III, "Methodology of NEQ (f) analysis for optimization and comparison of digital breast tomosynthesis acquisition techniques and reconstruction algorithms," Medical Imaging 2007: Physics of Medical Imaging, Hsieh J, Flynn MJ, Eds., Proc. SPIE 6510, 651011 (2007).
41. Johnson JP, **Lo JY**, Mertelmeier T, Nafziger JS, Timberg P, and Samei E, "Visual image quality metrics for optimization of breast tomosynthesis acquisition technique," Medical Imaging 2007: Image Perception, Observer Performance, and Technology Assessment, Jiang Y, Sahiner B, Eds., Proc. SPIE 6515, 65150P (2007).
42. Singh S, Tourassi GD, and **Lo JY**, "Breast mass detection in tomosynthesis projection images using information-theoretic similarity measures," Medical Imaging 2007: Computer-Aided Diagnosis, Giger ML, Karssemeijer N, Eds., Proc. SPIE 6514, 651415 (2007).
43. Jerebko A, Quan Y, Merlet N, Ratner E, Singh S, **Lo JY**, and Krishnan A, "Feasibility study of breast tomosynthesis CAD system," Medical Imaging 2007: Computer-Aided Diagnosis, Giger ML, Karssemeijer N, Eds., Proc. SPIE 6514, 651414 (2007).

44. Saunders RS, Samei E, Majdi-Nasab N, and **Lo JY**, “Initial human subject results for breast bi-plane correlation imaging technique,” Medical Imaging 2007: Computer-Aided Diagnosis, Giger ML, Karssemeijer N, Eds., Proc. SPIE 6514, 651423 (2007).
45. Xia JQ, Tourassi GD, **Lo JY**, and Floyd CE, Jr., “On the development of a Gaussian noise model for scatter compensation,” Medical Imaging 2007: Physics of Medical Imaging, Hsieh J, Flynn MJ, Eds., Proc. SPIE 6510, 65102M (2007).
46. Li CM, Segars WP, **Lo JY**, Veress AI, Boone JM, Dobbins JT III, “Three-dimensional computer generated breast phantom based on empirical data,” Medical Imaging 2008: Physics of Medical Imaging, Proc. SPIE 6913, 691314 (2008).
47. Singh S, Tourassi GD, Chawla AS, Saunders RS, Samei E, **Lo JY**, “Computer-aided detection of breast masses in tomosynthesis reconstructed volumes using information-theoretic similarity measures,” Medical Imaging 2008: Computer-Aided Diagnosis, Giger ML, Karssemeijer N, Eds., Proc. SPIE 6915, 691505 (2008).
48. Chawla AS, Samei E, Saunders RS, **Lo JY**, Singh S, “Optimized acquisition scheme for multi-projection correlation imaging of breast cancer,” Medical Imaging 2008: Computer-Aided Diagnosis, Giger ML, Karssemeijer N, Eds., Proc. SPIE 6915, 691528 (2008).
49. Shafer CM, Samei E, Saunders RS, Zerhouni M, **Lo JY**, “Toward quantification of breast tomosynthesis imaging,” Medical Imaging 2008: Physics of Medical Imaging, Proc. SPIE 6913, 69134N (2008).
50. Chawla AS, Samei E, **Lo JY**, “Optimized lesion detection in digital breast tomosynthesis,” Medical Imaging 2009: Physics of Medical Imaging, Samei E, Hsieh Jiang, Eds., Proc. SPIE 7258, 72580P (2009).
51. Li CM, Segars WP, **Lo JY**, Veress AI, Boone JM, Dobbins JT III, “Computerized 3D breast phantom with enhanced high-resolution detail,” Medical Imaging 2009: Physics of Medical Imaging, Samei E, Hsieh Jiang, Eds., Proc. SPIE 7258, 72580S (2009).

C. CHAPTERS IN BOOKS

- 1 **Lo JY**, and Floyd CE, Jr, “Computer-aided diagnosis of breast cancer,” Doi K et al., Ed., First International Workshop on Computer-Aided Diagnosis, Elsevier Science, Univ. of Chicago, Chicago, IL, 1182 (ICS 1182): 221-5 (1998).
- 2 **Lo JY**, “Macintosh IRC Clients,” Charalabidis A, Ed., The Book of IRC: The Ultimate Guide to Internet Relay Chat, ISBN 1886411298, No Starch Press, San Francisco CA (1999).

- 3 Baker JA, and **Lo JY**, “Methods, limitations, and future directions in computer-aided diagnosis of breast cancer,” Advances in Digital Radiography: RSNA Categorical Course in Diagnostic Radiology Physics 2003, Samei E and Flynn MJ, Ed., Radiological Society of North America, Oak Brook, IL: 243-252 (2003).
- 4 **Lo JY**, Bilska-Wolak AO, Baker JA, Tourassi GD, Floyd CE, Jr, and Markey MK, “Computer-aided diagnosis in breast imaging: Where do we go after detection?” Suri JS and Rangayyan R, Ed., Recent Advances in Breast Imaging, Mammography, and Computer-Aided Diagnosis of Breast Cancer, ISBN 0-8194-6081-8, SPIE Press: 871-900 (2006).
- 5 Land WH, McKee DW, Anderson FR, Masters T, **Lo JY**, Embrechts M, and Heine J, “Using computational intelligence for computer-aided diagnosis of screen-film mammograms,” Suri JS and Rangayyan R, Ed., Recent Advances in Breast Imaging, Mammography, and Computer-Aided Diagnosis of Breast Cancer, ISBN 0-8194-6081-8, SPIE Press: 315-375 (2006).

D. INVITED TALKS AND LECTURES

1. **Lo JY**, “Principles of CAD/CADx,” Special Course: Digital Radiography – Computer-Aided Detection/Diagnos RC525A, chaired by E. Samei and M. J. Flynn, in Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL, 2002.
2. **Lo JY**, Floyd CE, Jr, Chan HP, Giger ML, McNitt-Gray M, Roehrig J, and Summers R, “Unanswered questions in CAD research,” in American Association of Physicists in Medicine, San Diego, CA, 2003; abstract published in Med Phys 30: 1433 (**Lo JY**, special session organizer and moderator).
3. Baker JA and **Lo JY**, “Breast Computer-aided Diagnosis: Limitations and Future Directions,” Advances in Digital Radiography: RSNA Categorical Course in Diagnostic Radiology Physics RC825C, chaired by E. Samei and M. J. Flynn, in Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL, 2003.
4. Baker JA and **Lo JY**, “Breast Computer-aided Diagnosis: Limitations and Future Directions,” Advances in Digital Radiography: RSNA Categorical Course in Diagnostic Radiology Physics RC625C, chaired by E. Samei and M. J. Flynn, in Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL, 2004.
5. **Lo JY** and Baker JA, “Breast Computer-aided Diagnosis: Limitations and Future Directions,” Advances in Digital Radiography: RSNA Categorical Course in Diagnostic Radiology Physics RC225B, chaired by E. Samei and M. J. Flynn, in Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL, 2005.

6. R. Nishikawa and **Lo JY** (co-presenters), "Opportunities for Improved Computer Performance," in "What Can We Expect from a Computer in the Interpretation of Medical Images?" special workshop moderated by M. L. Giger, in *Medical Imaging*, annual meeting of International Society for Optical Engineering, San Diego, CA, 2006.
7. **Lo JY**, Singh S, Samei E, Dobbins JT, III, "New Developments in Digital Breast Tomosynthesis," *Advances in X-ray Imaging*, chaired by A. Karellas, in American Association of Physicists in Medicine, Minneapolis MN 2007.
8. **Lo JY**, "What Every Medical Physicist Should Know about Breast Tomosynthesis," *Advances in Breast Imaging*, chaired by A. Karellas, in American Association of Physicists in Medicine, Houston TX 2008.
9. **Lo JY**, Baker JA, "Clinical Experience with the Siemens Breast Tomosynthesis System," *Breast Committee*, chaired by C. Lehman, American College of Radiology Imaging Network (ACRIN) 2008 Fall Meeting, Arlington VA 2008.

E. SELECTED ABSTRACTS:

1. Floyd CE, Jr, **Lo JY**, Chotas HG, and Ravin CE, "Quantitative digital radiography using a photostimulable phosphor imaging system," Association of University Radiologists, Minneapolis, Minn., (1990).
2. Floyd CE, Jr, **Lo JY**, and Ravin CE, "Simultaneous acquisition of diagnostic and scatter images in chest radiography," *Radiology* 177(P), 268 (1990).
3. **Lo JY**, Floyd CE, Jr, Chotas HG, and Ravin CE, "Quantitative scatter measurement in digital radiography using a photostimulable phosphor system," Association of University Radiologists, Minneapolis, Minn., (1990).
4. **Lo JY**, Floyd CE, Jr, and Ravin CE, "Scatter compensation in chest radiography with a single-exposure estimation-subtraction method," *Radiology* 177(P), 172-173 (1990).
5. Baker JA, Floyd CE, Jr, and **Lo JY**, "Observer evaluation of scatter compensation for digital portable chest radiographs," *Radiology* 181(P), 137 (1991).
6. Baker JA, Floyd CE, Jr, **Lo JY**, Chotas HG, and Ravin CE, "Scatter fraction measurements in patients using computed radiography," Association of University Radiologists, Orlando, Fla., (1991).
7. **Lo JY**, Baker JA, and Floyd CE, Jr, "Artificial neural network for estimating scatter exposures in portable chest radiography," *Radiology* 181(P), 143 (1991).
8. **Lo JY**, Dobbins JT, III, and Floyd CE, Jr, "Fractal analysis for edge-enhancement in digital chest radiography," *Radiology* 181(P), 143 (1991).

9. **Lo JY**, Floyd CE, Jr, Baker JA, Chotas HG, and Ravin CE, "Quantitative scatter compensation in clinical portable digital chest radiographs," Association of University Radiologists, Orlando, Fla., (1991).
10. Baydush AH, Floyd CE, Jr, **Lo JY**, Bowsher JE, and Ravin CE, "Improved contrast-to-noise in digital chest radiography by Bayesian image estimation," Association of University Radiologists, Chicago, Ill., (1992).
11. Baydush AH, Floyd CE, Jr, **Lo JY**, Bowsher JE, and Ravin CE, "Scatter reduction in portable digital chest radiography by Bayesian image estimation," Radiology 185(P), 305 (1992).
12. Jordan LK, III, Floyd CE, Jr, **Lo JY**, Chotas HG, and Ravin CE, "Development of the Posterior Beam Stop scatter measurement technique for conventional chest radiography including anti-scatter grids," Association of University Radiologists, Chicago, Ill., (1992).
13. **Lo JY**, Floyd CE, Jr, Bowsher JE, and Ravin CE, "Spatial-varying scatter estimation in portable chest radiography using an artificial neural network," Radiology 185(P), 300 (1992).
14. **Lo JY**, Floyd CE, Jr, and Ravin CE, "Spatial-varying scatter compensation for portable chest radiographs using an artificial neural network," Association of University Radiologists, Chicago, Ill., (1992).
15. **Lo JY**, Baydush AH, Floyd CE, Jr, and Ravin CE, "Comparative evaluation of scatter compensation techniques for quantitative digital chest radiography," Radiology 189(P), 129 (1993).
16. **Lo JY**, Floyd CE, Jr, and Tourassi GD, "Artificial neural networks for diagnosis in radiology," Lo SCB, Ed., Computer-Aided Diagnosis Workshop, Georgetown University Medical Center, Washington, DC, 22 (1994).
17. **Lo JY**, Baker JA, Kornguth PJ, and Floyd CE, Jr, "Application of artificial neural networks to the interpretation of mammograms based on the radiologist impression and optimized BI-RADS™ image features," Radiology 197(P), 242 (1995).
18. **Lo JY**, Baydush AH, Baker JA, Kornguth PJ, and Floyd CE, Jr, "Computer-aided diagnosis of breast mass malignancy using automated feature extraction and artificial neural networks," Radiology 197(P), 425 (1995).
19. **Lo JY**, Baker JA, and Floyd CE, Jr, "Artificial neural networks for the prediction of breast cancer invasiveness by using Breast Imaging and Reporting Data System mammography lexicon," Radiology 201(P), 370 (1996).
20. **Lo JY**, and Floyd CE, Jr, "Analysis of error surfaces of neural network applied to computer-aided diagnosis in mammography," World Congress on Neural Networks '96 (International Neural Network Society 1996 Annual Meeting), Lawrence Erlbaum Associates, Inc., San Diego, CA, 1240 (1996).

21. **Lo JY**, Baker JA, Frederick ED, Kornguth PJ, and Floyd CE, Jr, "Predicting breast lesion malignancy and invasion using the BI-RADS mammography lexicon," *Radiology* 205(P), 447 (1997).
22. Baker JA, Frederick ED, **Lo JY**, Kornguth PJ, and Floyd CE, Jr, "Incorporation of an artificial neural network into clinical mammography to reduce benign breast biopsies," *AJR Am J Roentgenol Supplement* 170, 84 (1998).
23. **Lo JY**, Kornguth PJ, and Floyd CE, Jr, "Multi-institution evaluation of BI-RADS breast cancer prediction model," *Radiology* 209(P), 271 (1998).
24. **Lo JY**, and Floyd CE, Jr, "Predicting malignancy of breast masses with ultrasound findings," *Radiology* 213(P), 198 (1999).
25. **Lo JY**, and Floyd CE, Jr, "Predicting malignancy and invasion of breast lesions from BI-RADS and history data: New results from 1204 cases," *Radiology* 217(P), 317 (2000).
26. Markey MK, **Lo JY**, and Floyd CE, Jr, "Differences in computer aided diagnosis of breast cancer: masses vs. calcifications," *Chicago 2000: World Congress on Medical Physics and Biomedical Engineering*, Chicago, IL, (2000).
27. **Lo JY**, Samei E, Jesneck JL, Dobbins JT, III, Baker JA, Singh S, Saunders RS, and Floyd CE, Jr, "Radiographic technique optimization for amorphous selenium FFDM system: phantom and patient results," in *Scientific Assembly and Annual Meeting of the Radiological Society of North America*, Chicago, IL (Radiological Society of North America, Chicago, IL, 2004), p.689-670.
28. Chen Y, **Lo JY**, and Dobbins JT, 3rd, "Matrix Inversion Tomosynthesis (MITS) of the breast: Preliminary results," in *Scientific Assembly and Annual Meeting of the Radiological Society of North America*, Chicago, IL (Radiological Society of North America, Chicago, IL, 2004).
29. **Lo JY**, Baker JA, Orman J, Mertelmeier T, Singh S, "Breast Tomosynthesis: Initial Clinical Experience with 100 Human Subjects," in *Scientific Assembly and Annual Meeting of the Radiological Society of North America*, Chicago, IL (Radiological Society of North America, Chicago, IL, 2006).
30. **Lo JY**, Baker JA, "Breast Tomosynthesis: Assessing Patient Compression, Comfort, and Preference," in *Scientific Assembly and Annual Meeting of the Radiological Society of North America*, Chicago, IL (Radiological Society of North America, Chicago, IL, 2006).
31. Riofrio A, Baker JA, **Lo JY**. "Performance of Single-Versus Two-Projection Breast Tomosynthesis for Lesion and Cancer Detection," *1st Place for the Scientific Trainee Prize* in Association of University Radiologists (AUR) Meeting, Arlington, Virginia (2009).

II. CONSULTANT APPOINTMENTS:

ASSOCIATE EDITOR:

Medical Physics, 2005-present

MANUSCRIPT REVIEWER:

Medical Physics, 1993-present

Academic Radiology, 1997-present

IEEE Transactions Medical Imaging, 1999-present

IEEE Transactions on Information Technology in Biomedicine, 2007

Medical Decision Making, 2001-present

Technology in Cancer Research and Treatment, 2004-present

Neural Networks, 2005-present

American Journal of Roentgenology, 2006-present

Journal of Digital Imaging, 2004-present

Artificial Intelligence in Medicine, 2004-present

GRANT REVIEWER:

United States Army Medical Research and Materiel Command, Breast Cancer Research Program, 1995-1998.

Susan G. Komen for the Cure, 2000-present.

- Chair of Detection, Diagnosis, and Prevention panel, 2007: responsible for recruiting reviewers, assigning proposals, and directing review session.
- External advisor, Grants Program Redesign Working Group, 2007: advise Komen on a complete redesign of grant award process including scientific and advocate peer review as well as programmatic review.
- Member of review panel, 2000-present.

NCI Special Emphasis Panels:

- Initial Review Group 2004/01 ZCA1 SRRB-9, 2003.
- P01 “Discovery and Development,” ZCA1 GRB-P (J1) R, Feb and Oct 2007, Oct 2008.

NIH Special Emphasis Panels:

- “Small Business Applications on Imaging Technologies,” ZRG1 SSS-7, 2000-2003
- “Medical Imaging: Nanotechnology,” ZRG1: SBMI (50) B, 2004.

- “Development of methods for in vivo imaging and bioengineering research,” SBIB-J, 2005.
- “Fellowships: Imaging,” SBIB-R, 2005.
- “Novel Imaging,” SBIB-J, 2006.

INDUSTRY AND COMMERCIAL:

Siemens Medical Solutions:

- PI of research agreement: “Collaboration in the areas of Digital Mammography and Breast Tomosynthesis”
 - 2003-2006
 - 2006-2008
 - 2008-2010 (pending)
- Research consultant, 2004-present

Morgan Stanley Research

Guidepoint Global Advisors

Gerson Lehrman Group

Healthcare Research Consulting Group

Coleman Research Group

Vista Research

Society of Industry Leaders

III. PARTICIPATION IN ORGANIZATIONS:

1) MEDICAL IMAGE PERCEPTION SOCIETY

Co-director of Medical Image Perception Conference X, 2003

I co-directed (with Ehsan Samei) this biannual meeting of the Medical Image Perception Society, held in Durham, NC. We were jointly responsible for publicity, abstract review, program selection and scheduling, logistics and finances, and all other details of conference organization. In addition, I was solely responsible for website development and CD-ROM production.

2) AMERICAN ASSOCIATION OF PHYSICISTS IN MEDICINE

Member, Task Group No. 171 Tomosynthesis

Charge: Develop recommended QC and Acceptance tests for both radiographic and mammographic diagnostic x-ray tomosynthesis systems. Some of these tests could include: spatial resolution (MTF), slice thickness (slice sensitivity profile), image lag between projections, artifacts (e.g., zipper artifact from microcalcifications), artifact spread function, line object spread function, SDNR, contrast-detail, NPS, uniformity, collimation, and distance and angle measurements. In addition, develop methods for estimating average glandular dose and phantoms for testing image quality.

Member, Computer Aided Detection in Diagnostic Imaging (CAD) Subcommittee

Charge: To keep the membership apprised of new developments in computer-assisted detection and diagnosis in medical imaging and to develop techniques, practices and standards that address issues in the field as they arise.

Session organizer and chair, 2003 annual meeting.

3) RADIOLOGICAL SOCIETY OF NORTH AMERICA

Scientific session chair, annual conference, 2003, 2004, 2007

4) INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING

Scientific program committee and session chair, annual conference 2009

IV. AREAS OF RESEARCH INTEREST (BASIC AND APPLIED):

COMPUTER-AIDED DIAGNOSIS

breast cancer: multi-modality predictive modeling
automated detection and characterization of lesions in breast imaging
clinical observer performance
assessment of commercial computer-aided detection technology

DIGITAL MAMMOGRAPHY & BREAST TOMOSYNTHESIS

breast tomosynthesis imaging (PI of Duke-Siemens collaboration)
digital mammography detector characterization
digital mammography radiographic technique optimization
noise and scatter compensation in breast imaging

DIGITAL CHEST RADIOGRAPHY

chest tomosynthesis / correlation imaging
scatter compensation: numerical and hardware techniques
automated detection of nodules in chest radiographs
quantitative exposure measurements

MEDICAL ONCOLOGY

quantitative assessment of breast cancer risk using density and stromal patterning

RADIATION ONCOLOGY

optimization of intensity modulated radiation therapy (IMRT) planning

V. TEACHING RESPONSIBILITIES:

1) ORGANIZER & INSTRUCTOR, MEDPHY 251, SEMINARS IN MEDICAL PHYSICS, 2003-PRESENT

I have been organizing and teaching this graduate-only seminar course every semester since spring 2003. (Co-instructors Ehsan Samei 2003-2006, Mark Oldham 2006-present.) Current enrollment is approximately 45 students, primarily from medical physics and biomedical engineering. Course was selected as part of prestigious Duke Digital Initiative which explores innovative educational use of digital technologies including Apple iPods. Seminar schedule available at <http://medicalphysics.duke.edu/seminar/>. Responsibilities include organizing seminar schedule, inviting and coordinating external speakers, moderating weekly seminars, and grading.

NB: Before this permanent course number took effect in fall 2006, this course was previously known as BME 365 (spring 2006), BME 251 (fall 2005), BME 365 (spring 2005), and BME 265 (prior to 2005).

2) DISSERTATION/THESIS ADVISOR:

BIOMEDICAL ENGINEERING (BME) AND MEDICAL PHYSICS (MEDPHY)

Marios Gavrielides (BME Ph.D. co-advisor, graduated 2001)
Mia K. Markey (BME Ph.D. advisor, graduated 2002)
Anya Bilaska-Wolak (BME Ph.D. co-advisor, graduated 2004)
Jonathan Jesneck (BME Ph.D. advisor, graduated 2007)
Jessie Q. Xia (BME Ph.D. advisor, graduated 2007)
Ada Y. Chen (BME Ph.D. co-advisor, graduated 2007)
Swatee Singh (BME Ph.D. advisor, graduated 2008)
Christina M. Shafer (BME Ph.D. advisor, matriculated 2006)
Vorakarn Chanyavanich (MEDPHY Ph.D. advisor, matriculated 2006)
Deep Mehtaji (MEDPHY M.S. advisor, matriculated 2008)
Matthew Freeman (MEDPHY M.S. advisor, matriculated 2008)
Erfan Karim (BME M.S. advisor, matriculated 2008)
Greeshma Agasthya (BME Ph.D. advisor, matriculated 2009)

3) DISSERTATION/THESIS COMMITTEE AND OTHER MENTORING:

Yanting Dong (ECE Ph.D.)
Jeremy Dahl (BME Ph.D., graduated 2004)
Devon G. Godfrey (BME Ph.D., graduated 2006)
Jamie Shorey (ECE Ph.D., graduated 2007)
Jonathan Jesneck (statistics M.S., graduated 2007)
Lakshmi Seetharaman (BME M.S. student, transferred 2007)
Shawn Mendonca (BME BSE independent study, graduated 2007)

Amarpreet Chawla (BME Ph.D., graduated 2008)
Sherry Leeper (MEDPHY M.S., graduated 2009)
Ryan Davis (MEDPHY M.S., graduated 2009)
Brandon Mader (MEDPHY M.S., graduated 2009)
Adam Dixon (BME BSE independent study, graduated 2009)
Christina Li (BME Ph.D. student, matriculated 2004)

4) MENTOR, BIOMEDICAL IMAGING & MEDICAL PHYSICS STUDY PROGRAM, SCHOOL OF MEDICINE

I served as the primary mentor or co-mentor for the following third year medical students:

John Zhang (2000-2001)
John Kim (2002-2003)
Andrea Hong – co-mentor with Jay Baker MD (2003-2004)
Stanton Stebbins (2004-2005)
Jeffrey Maxwell – co-mentor with Jay Baker MD (2006-2007)
Alexie Riofrio – co-mentor with Jay Baker MD (2008-2009)

5) DIRECTOR, BIOMEDICAL IMAGING & MEDICAL PHYSICS STUDY PROGRAM, SCHOOL OF MEDICINE

As director, I mentored approximately 4 students every year since 1999. Duties include recruiting students, advising student with selection of mentor and research project, supervision of research grading, revision and approval of thesis, and other general advising.

Recent students listed below:

2005: Ajay Kamireddi, Taymon Domzalski, Page Inman
2006: Luke Hoagland, Jeffrey Maxwell, Robert Jones, Pretesh Patel
2007: Matthew McCarthy, Adam Reese, Abraham Thomas, Thomas Williams
2008: Nita Amornsiripanitch, Benjamin Harris, Jared Issacson, Alexie Riofrio
2009: Michael Roach, Andrew Roberts, Michael Rosenberg

6) ORGANIZER & CO-INSTRUCTOR, RADIOLOGY RESIDENTS MEDICAL PHYSICS REVIEW COURSES:

2004-present: Co-instructor of these lectures to educate radiology residents in the basic sciences of medical physics and help them prepare for American Board of Radiology exams.

2008-present: Assumed responsibility as organizer of these lectures.

VI. PARTICIPATION IN ACADEMIC AND ADMINISTRATIVE ACTIVITIES OF THE UNIVERSITY AND MEDICAL CENTER:

1) DIRECTOR, BIOMEDICAL IMAGING & MEDICAL PHYSICS (BIMP) THIRD YEAR STUDY PROGRAM, SCHOOL OF MEDICINE, 1999-PRESENT:

The third year at the Duke University School of Medicine represents a unique opportunity for the student to broaden her or his background in the biomedical and social sciences which are the basis of clinical medicine. The primary goal of the third year is to develop tomorrow's physician leaders through a rigorous scholarly experience in biomedical-related research.

- a) Participate in monthly meetings of the Third Year Committee, including:
 - develop general policies and vote on specific decisions pertaining to all aspects of the third year experience
 - approve new faculty mentors
 - approve study away proposals
 - grade theses
- b) Present BIMP research to MSI / MSII students at Third Year Fair, clinical science luncheon series, radiology interest group, etc.
- c) Guide MSI and MSII students to match with appropriate mentor and project.
- d) Advise MSIII students within my own study program, including monitoring research progress, ensuring compliance with mandatory research ethics and other training, approving grades, reading and revising theses, etc.
- e) Coordinate the third year website <<http://thirdyear.mc.duke.edu>> including a major 2002-2004 redesign and continued updates in conjunction with the third year coordinator and Education Media Services. This included coordinating with 400+ Duke faculty serving as third year mentors in their early adoption and continued updates of the Faculty Research Database (FReD) which is used to generate third year website data automatically.
- f) Serve as a third year mentor myself, including providing project guidance, laboratory resources, revising thesis and publications, career advice, etc.

2) PROMOTIONS COMMITTEE (ENTERING CLASS OF 2001 AND 2005), SCHOOL OF MEDICINE, 2002-PRESENT:

- a) Participate in final decisions regarding promotion of medical students to each successive year, including regular meetings with advisory deans and registrar staff to assess each student's coursework performance, professionalism, qualifications for study away, etc.
- b) Coordinate and communicate decisions with third year committee

3) CO-CHAIR & MEMBER, ADMISSIONS COMMITTEE, MEDICAL PHYSICS GRADUATE PROGRAM, 2005-PRESENT

- a) Appointed annually since 2005 as representative for diagnostic imaging study track (1 of 4 tracks comprising the program).
- b) Appointed 2008 onward as co-chair of committee.
- c) Review and rank >100/yr M.S. and Ph.D. applications.
- d) Recruit and interview all Ph.D. applicants.
- e) Advise director of graduate studies in final admissions decisions.

4) WEBMASTER, MEDICAL PHYSICS GRADUATE PROGRAM, 2005-PRESENT

- a) Single-handedly designed and implemented initial 2005-2009 version of our website <<http://medicalphysics.duke.edu>> which serves as primary recruiting tool for this newly approved program.
- b) Supervised professional re-design of website in 2009.
- c) Lead discussions with members of website committee and student volunteers regarding website design and content.

5) SITE-BASED RESEARCH COMMITTEE, DEPARTMENT OF RADIOLOGY, 2007-PRESENT.

Site-Based Research (SBR) groups provide the organizing structure for the conduct of any research in the School of Medicine in which a Duke Faculty member is responsible for the involvement of human subjects. The SBR is the operating and business unit responsible for the integrity, financial accountability, regulatory compliance, quality, and academic productivity of this research activity.

- a) Participate in monthly meetings to review and approve radiology research projects including scientific methods, budget, and billing grids.
- b) Coordinate faculty research with regards to contract negotiations with external industry funding sources.

VII. EXTERNAL SUPPORT (PAST AND PRESENT):

Boldface indicates PI or co-PI. Listed in chronological order. Dollar amounts are total costs over all years unless otherwise indicated.

Grant Summary:

TOTAL NUMBER OF GRANTS: 25
NUMBER OF GRANTS AS PI: 21 (*5 from NIH*)
TOTAL COSTS FOR GRANTS AS PI: \$5,755,777
(LAST 5 YEARS 2004-2009) \$3,321,458

- 1) **Principal Investigator**, DAMD17-94-J-4371, "Computer Aided Mammography Using Automated Feature Extraction for the Detection and Diagnosis of Breast Cancer," US Army Breast Cancer Research Program, \$130,000, 9/15/94 – 10/15/97.
- 2) Co-investigator, "Computer Aided Breast Cancer Diagnosis," PI Carey Floyd. US Army Breast Cancer Research Program, \$620,000, 9/1/94 – 9/31/98.
- 3) Co-investigator, "Computer Aided Diagnosis of Breast Cancer: a Multi-Center Demonstration," PI Carey Floyd. US Army Breast Cancer Research Program, \$340,000, 10/1/96 – 6/30/00.
- 4) **Principal Investigator**, DAMD17-96-1-6226, "Breast Ultrasound: Computer-Aided Diagnosis Approach to Improving Specificity and Decreasing Observer Variability," US Army Breast Cancer Research Program, \$340,000, 1/1/96 – 1/30/00.
- 5) **Principal Investigator**, RG 97-0322, "Artificial Neural Networks for Breast Cancer Invasion," Whitaker Foundation, \$156,319, 1/1/98 – 12/31/00.
- 6) **Principal Investigator**, R29 CA75547, "Computer-aided Diagnosis of Breast Cancer Invasion," NIH/NCI, \$540,000, 7/1/98 – 6/30/03.
- 7) **Principal Investigator**, R21 CA92573, "Improved diagnosis of breast microcalcification clusters," NIH/NCI, \$310,000, 7/1/01 – 6/30/03.
- 8) **Principal Investigator**, DISS 0100400, "Modular machine learning methods for computer-aided diagnosis of breast cancer," Susan G. Komen Breast Cancer Foundation, \$30,000, 10/1/01-9/30/02.
- 9) **Principal Investigator**, R21 CA93461, "Predicting breast cancer with ultrasound and mammography," NIH/NCI, \$310,000, 3/1/02-2/28/05.
- 10) **Principal Investigator**, DAMD17-02-1-0367, "Improved Breast Cancer Detection using a novel sub-region Hotelling Observer Technique," US Army Breast Cancer Research Program, \$462,000, 4/1/02-3/31/06 (Transferred from original PI Alan Baydush)

- 11) **Principal Investigator**, DAMD17-02-1-0373 (predoctoral fellowship for Jonathan Jesneck), “Modular machine learning methods for computer-aided diagnosis of breast cancer,” US Army Breast Cancer Research Program, \$66,000, 5/1/02-4/30/05
- 12) **Principal Investigator**, DAMD17-03-1-0186, “Design and Clinical Efficacy of a Computer-Aided Detection Tool for Masses in Mammograms,” US Army Breast Cancer Research Program, \$90,000, 5/15/03-6/1/05 (predoctoral fellow Singh).
- 13) Co-investigator, R01-CA95061-01, “Reducing Benign Breast Biopsies with Computer Modeling,” PI Jay Baker. NIH/NCI, \$1,078,000, 6/01/03-5/31/08.
- 14) **Principal Investigator**, Digital Mammography Research Agreement, Siemens Medical Solutions, \$90,000, 10/1/03-9/30/06.
- 15) **Principal Investigator**, W81XWH-05-1-0278, “Image Processing and Computer Aided Diagnosis in Computed Tomography of the Breast,” US Army Breast Cancer Research Program, \$90,000, 3/1/05-3/31/08 (predoctoral fellow Xia).
- 16) **Principal Investigator**, W81XWH-05-1-0292, “A Computer-Aided Diagnosis System of Breast Cancer Combining Mammography and Proteomics,” US Army Breast Cancer Research Program, \$90,000, 5/1/05-6/1/08 (predoctoral fellow Jesneck).
- 17) **Principal Investigator**, W81XWH-05-1-0293, “Computer-Aided Detection of Breast Masses in Digital Tomosynthesis,” US Army Breast Cancer Research Program, \$90,000, 06/01/05-06/30/08 (predoctoral fellow Singh).
- 18) **Principal Investigator**, R01 CA-112437-01, “Tomosynthesis for Improved Breast Cancer Detection,” NIH/NCI, \$1,287,119, 6/20/06–3/31/10.
- 19) **Principal Investigator**, Digital Mammography Research Agreement, Siemens Medical Solutions, \$100,000, 10/1/06-9/30/08.
- 20) **Principal Investigator**, R01 CA94236, “Breast CT Scanner for Early Cancer Detection,” NIH/NCI (Subcontract with Univ. of California), \$394,742, 9/01/04-8/31/07. (Transferred from original PI Carey Floyd)
- 21) Co-investigator, 1R01-CA115748-02, “Accurate prediction of cardiac and lung radiation injury,” PI Shiva Das. NIH/NCI, \$719,820, 5/10/06–4/30/10.
- 22) **Co-Principal Investigator** with Victoria Seewaldt, W81XWH-07-1-0393, “Biologic and Computational Models of Mammographic Density and Stromal Patterning,” US Army Breast Cancer Research Program, \$779,275, 07/01/07-07/31/09.
- 23) **Principal Investigator**, “Knowledge-based optimization of radiation treatment planning for prostate cancer,” Wallace H. Coulter Translational Partners Grant Program, \$150,000, 4/1/08–3/31/09.
- 24) **Principal Investigator**, Digital Mammography Research Agreement, Siemens Medical Solutions, \$100,000, 10/1/08-9/30/10.

- 25) **Principal Investigator**, “Optimization of radiation treatment planning for prostate cancer,” Wallace H. Coulter Translational Partners Grant Program, \$150,322, 4/1/09–3/31/10.